San Lorenzo River Bridge and Kings Creek Bridge Replacement

State Route 9 in Boulder Creek, Santa Cruz County, CA

05-SCR-9-PM 13.6/15.5

EA: 05-1H470

Project ID: 0516000078

SCH Number: 2020120272

Initial Study with Mitigated Negative Declaration/Environmental Assessment with Finding of No Significant Impact

Prepared by the

State of California Department of Transportation

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016 and executed by the Federal Highway Administration and Caltrans.

February 2021

Caltrans

General Information About This Document

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration, has prepared this Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment, which examines the potential environmental impacts of alternatives being considered for the proposed project in Santa Cruz County in California.

The document explains why the project is being proposed, the alternatives being considered for the project, the existing environment that could be affected by the project, potential impacts of each of the alternatives, and proposed avoidance, minimization, and/or mitigation measures.

The Draft Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment was circulated to the public for 30 days between December 15, 2020 and January 14, 2021. Comments received during this period are included in Appendix G, Comment Letters and Responses. Elsewhere throughout this document, three asterisks mark the start of a change that was made since the draft document circulation, and two asterisks come at the end of the change. Areas where content was removed since the draft document circulation are denoted with three asterisks followed by a dash and two asterisks.

Additional copies of the document can be downloaded at the following website: https://dot.ca.gov/caltrans-near-me/district-5

Related technical studies are available upon request. If you would like a printed or CD version of this document or its related technical studies, then please contact Matt Fowler at 805-542-4603 or by email to matt.c.fowler@dot.ca.gov

To save paper, this document has been set up for two-sided printing (to print the front and back of a page). Blank pages occur where needed throughout the document to maintain proper layout of the chapters and appendices.

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 write to or call Caltrans, Attention: Matt Fowler; Central Region Environmental, 50 Higuera Street; San Luis Obispo, CA 93401; (805) 542-4603 (Voice), or use California Relay Service 1 (800) 735-2929 (TTY to Voice), 1 (800) 735-2922 (Voice to TTY), 1 (800) 855-3000 (Spanish TTY to Voice and Voice to TTY), 1-800-854-7784 (Spanish and English Speech-to-Speech) or 711.

SCH Number: 2020120272
05-SCR-9-PM 13.6/15.5
Project EA: 05-1H470
Project Number: 0516000078

Replace bridges on State Route 9 at San Lorenzo River Bridge Number 36-0052 (at post mile 13.6) and Kings Creek Bridge Number 36-0054 (at post mile 15.5) in Santa Cruz County

INITIAL STUDY with Mitigated Negative Declaration/Environmental Assessment with Finding of No Significant Impact

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C)

THE STATE OF CALIFORNIA
Department of Transportation
and
California Transportation Commission

John Luchetta
Office Chief
Central Coast Environmental Office
California Department of Transportation
National Environmental Policy Act Lead Agency

February 2, 2021

Date

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CALIFORNIA DEPARTMENT OF TRANSPORTATION
FINDING OF NO SIGNIFICANT IMPACT (FONSI)

FOR

San Lorenzo River Bridge and Kings Creek Bridge Replacement Project
05-SCR-9-PM 13.6/15.5
EA: 05-1H470
Project ID: 0516000078)

The California Department of Transportation (Caltrans) has determined that alternative (Build Alternative-Replace Existing Bridges) will have no significant impact on the human environment. This Finding of No Significant Impact is based on the attached Environmental Assessment which has been independently evaluated by Caltrans and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required. Caltrans takes full responsibility for the accuracy, scope, and content of the attached Environmental Assessment.

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S. Code 327 and the Memorandum of Understanding dated December 23, 2016 and executed by the Federal Highway Administration and Caltrans.

John Luchetta
Office Chief
Central Coast Environmental Office
California Department of Transportation
National Environmental Policy Act Lead Agency

February 2, 2021

Date

Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

State Clearinghouse Number: 2020120272

District-County-Route-Post Mile: 5-SCR-9-PM 13.6/15.5

EA/Project Identification: 05-1H470/0516000078

Project Description

The California Department of Transportation (known as Caltrans) proposes to replace the San Lorenzo River Bridge (Number 36-0052) at post mile 13.6 and Kings Creek Bridge (Number 36-0054) at post mile 15.5 on State Route 9 in Santa Cruz County, in the unincorporated community of Boulder Creek.

The project will remove and replace both bridges with new single-span, standard-width structures consisting of 12-foot-wide lanes and 8-foot-wide outside shoulders. Existing metal beam guardrail will be removed and replaced with a standard Midwest Guardrail System which will be connected to the bridge rail by Midwest Guardrail System Transition Railing Type WB-31. A taper will be paved on each side of the bridge to transition the new 8-foot-wide bridge shoulder to the existing roadway shoulder. Work in the streambeds is proposed and will require use of a temporary diversion system to dewater work areas for demolition and removal of existing bridge abutments and piers. Because the existing abutments at both bridges were constructed by casting materials directly into the exposed bedrock within the stream channel, the abutments will be partially removed in an effort to minimize removal of bedrock and alteration of the stream channel. Abutments and side support columns at the San Lorenzo River Bridge will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. At the Kings Creek Bridge, a portion of existing sacked concrete (0.049 acre), located approximately 10 feet above the Ordinary High Water Mark, along the existing northern abutment, will be replaced with rock slope protection. The existing pier located below the Ordinary High Water Mark will be removed to approximately 3 feet below original grade. This will result in a 22-square-foot increase in critical habitat area for special-status fish species at Kings Creek. It is anticipated that all work will occur within the existing state and County road rights-of-way, and no new right-of-way will be necessary. Existing utilities that would conflict with construction operations will be relocated by the owner prior to and during construction. The proposed bridges will be constructed along the existing State Route 9 alignment.

State Route 9 is a rural and mountainous highway that travels 35 miles from State Route 1 in the city of Santa Cruz along the Pacific Coast to State Route 17 in the town of Los Gatos at the southern edge of the greater San Francisco Bay Area. It passes through the San Lorenzo River Valley and the Saratoga Gap in the Santa Cruz Mountains. The project area is a section of the travel corridor that is in a rural setting surrounded by residential land uses.

Determination

This Mitigated Negative Declaration is included to give notice to interested agencies and the public that it is Caltrans's intent to adopt a Mitigated Negative Declaration for this project. This does not mean that Caltrans's decision on the project is final. This

Mitigated Negative Declaration is subject to change based on comments received from interested agencies and the public.

Caltrans has prepared an Initial Study for this project and, following public review, has determined from this study that the proposed project would not have a significant effect on the environment for the following reasons.

The project will have no effect involving energy, land use and planning, mineral resources, population and housing, public services, recreation, and tribal cultural resources.

The project will have less than significant effects involving aesthetics, agriculture and forest resources, air quality, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, noise, transportation, utilities and service systems, wildfire, and cumulative impacts.

With the following mitigation measures incorporated, the project will have less than significant effects to biological resources:

- Provisions for the immediate cleanup of all project-related hazardous materials spills and for the cleaning and refueling of equipment and vehicles.
- Provisions for temporary environmentally sensitive fencing, vegetation removal, erosion control, site restoration, revegetation plans, habitat restoration, and tree and shrub replacement.
- All work will be completed outside of the anticipated migration period for threatened and endangered fish species, through coordination with National Marine Fisheries Service and the California Department of Fish and Wildlife Service. In-stream work will be limited to June 1 and October 31, during the period of seasonally lower water levels.
- Provisions for worker environmental training programs, preconstruction surveys, active nest buffers, continued fish passage, dewatering/diversion activities and pumps, erosion and sediment control monitoring and oversight, aquatic species and fish capture and relocation, and stream diversion monitoring.

Compensatory mitigation is proposed for tree and shrub replacement in the riparian zone. All tree and shrub removal will be replaced after construction work is completed to replace riparian habitat as quickly as possible. Within the riparian zone, non-native trees that are removed will be replaced with native trees at a minimum 1:1 ratio and native trees will be replaced at minimum a 3:1 ratio. This ratio may increase as required by regulatory agency permit conditions.

John Luchetta
Office Chief
Central Coast Environmental Office
California Department of Transportation
National Environmental Policy Act Lead Agency

February 2, 2021

Date

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Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (known as Caltrans), as assigned by the Federal Highway Administration, is the lead agency under the National Environmental Policy Act (known as NEPA). Caltrans is also the lead agency under the California Environmental Quality Act (known as CEQA).

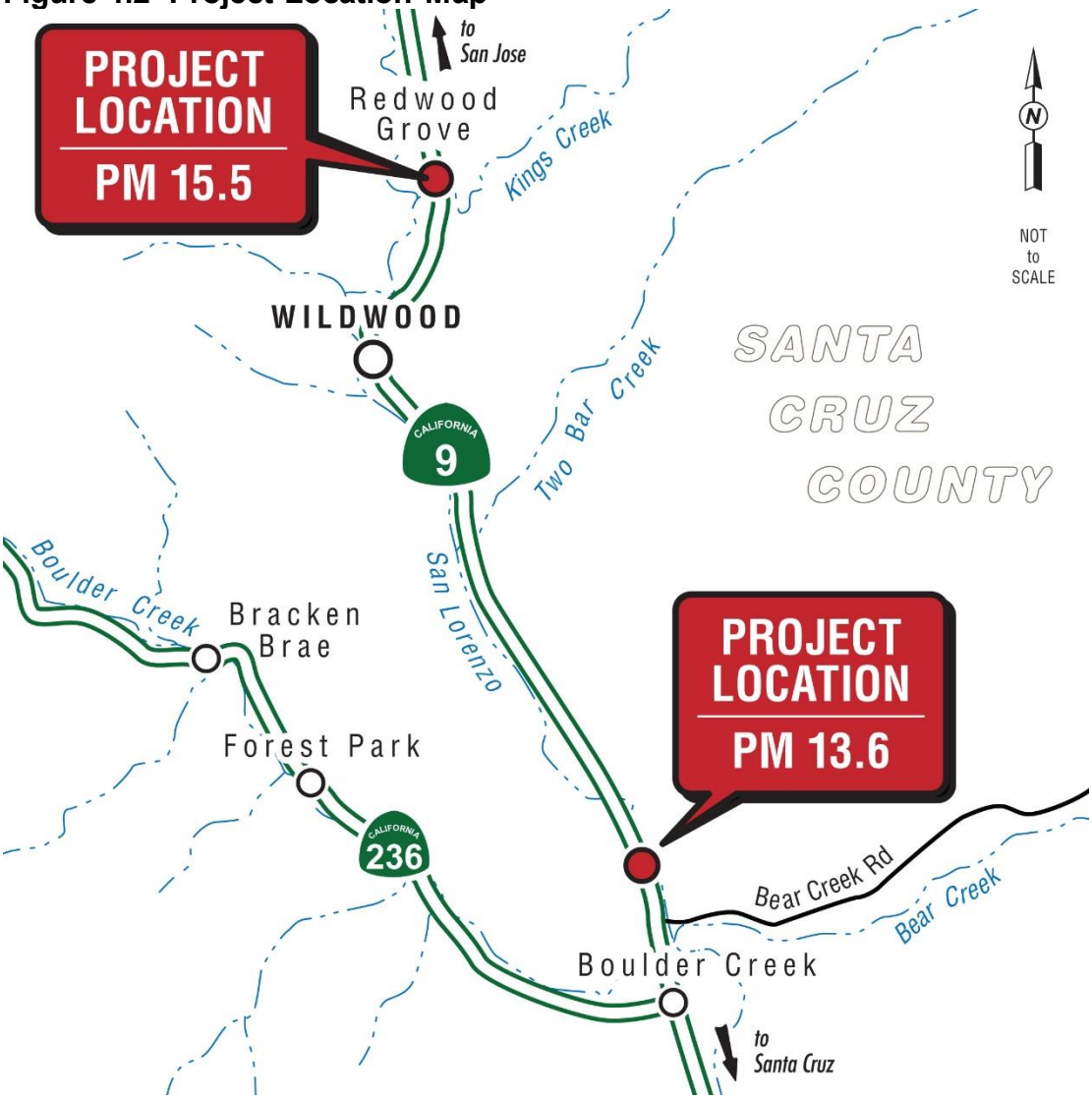
1.1.1 NEPA Assignment

California participated in the "Surface Transportation Project Delivery Pilot Program" (known as the Pilot Program) pursuant to 23 United States Code 327, for more than five years, beginning July 1, 2007, and ending September 30, 2012. MAP-21 (Public Law 112-141), signed by President Obama on July 6, 2012, amended 23 United States Code 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, Caltrans entered into a Memorandum of Understanding pursuant to 23 United States Code 327 with Federal Highway Administration. The National Environmental Policy Act Assignment Memorandum of Understanding became effective October 1, 2012, and was renewed on December 23, 2016, for a term of five years. In summary, Caltrans continues to assume Federal Highway Administration responsibilities under the National Environmental Policy Act and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With National Environmental Policy Act Assignment, Federal Highway Administration assigned and Caltrans assumed all of the United States Department of Transportation Secretary's responsibilities under the National Environmental Policy Act. 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 Federal Highway Administration assigned to Caltrans under the 23 United States Code 326 Categorical Exclusion Assignment Memorandum of Understanding, projects excluded by definition, and specific project exclusions.

The proposed project will address the superstructure and substructure deficiencies of the San Lorenzo River Bridge (Number 36-0052) and Kings Creek Bridge (Number 36-0054). The project is on State Route 9 at post mile 13.6 (San Lorenzo River) and at post mile 15.5 (Kings Creek) in Santa Cruz County, in the unincorporated communities of Boulder Creek and Redwood Grove. Figures 1.1 and 1.2 are project vicinity and location maps.

Figure 1.1 Project Vicinity Map

Figure 1.2 Project Location Map



This project is included in the 2018 Federal Statewide Transportation Improvement Program and is proposed for funding from the State Highway Operation Protection Program. It is also included in the Association of Monterey Bay Area Governments 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy and the cost-constrained 2018 Metropolitan Transportation Improvement Program and is listed under the State Highway Operation Protection Program Grouped Project Listing—Bridge Rehabilitation and Reconstruction. The current capital construction cost estimate, not escalated, for Build Alternative is $14,251,500. The current right-of-way cost, not escalated, is $32,500. The project's anticipated construction funding year is 2021/2022. ***Construction activities are expected to occur in several stages over two construction seasons starting in late 2022. However, the majority of demolition and construction will not start until the spring season of 2023.**

1.2 Purpose and Need

1.2.1 Purpose

The purpose of this project is to address the superstructure and substructure deficiencies of the San Lorenzo River Bridge (Bridge Number 36-0052) and Kings Creek Bridge (Bridge Number 36-0054) to ensure serviceability of State Route 9.

1.2.2 Need

Inspection reports for San Lorenzo River Bridge and the Kings Creek Bridge have indicated structural deficiencies and nonstandard features that need to be improved.

San Lorenzo Bridge

The San Lorenzo River Bridge was built prior to 1937. The existing bridge structure is 106 feet long and 31 feet wide and consists of two 12-foot-wide lanes, two 3.3-foot-wide sidewalks on either side, and no shoulders. Inspection of the bridge has identified the need to upgrade the bridge rails since the bridge has nonstandard timber bridge railing with no shoulders. The existing sidewalks and shoulders are considered nonstandard since current design standards require 8 feet for shoulder width and 6 feet for sidewalk width. Therefore, the existing shoulder and sidewalk widths are considered nonstandard. No standard recovery areas exist for vehicles. Furthermore, the existing guardrails leading up to the bridge block access to the sidewalks and force users to either enter the street or use the dirt shoulders before the bridge to squeeze between railings to overcome the obstacles. The bridge's paint system is in poor condition with a Paint Condition Index of 33 out of 100. Paint on the bottom flange of the steel girders was found to be peeling over 70 percent of the total area with observed rust spreading from the girder to the deck interface. Structural cracks are present in the concrete abutments and on the underside of the bridge at various spans and deck overhangs. Repeated patching of the deck wearing surface covers an estimated five percent of the deck area. Repeated patches to the concrete abutment walls cover an estimated ten percent of the surface area of the abutment faces. The existing abutments and side support columns currently support the existing bridge, but the bridge would need to be seismically retrofitted if the size or weight increased. Figure 1.3 provides a view of Route 9, overhead utilities, and the San Lorenzo River Bridge's deck, sidewalks, and railing from the southbound shoulder just north of the bridge.

Figure 1.3 San Lorenzo River Bridge (Bridge Number 36-0052)

Figure 1.4 Kings Creek Bridge (Bridge Number 36-0054)

Kings Creek Bridge

The Kings Creek Bridge was built in 1927. The existing bridge structure is 88 feet long and 28 feet wide and consists of two 11.5-foot-wide lanes, a 4.5-foot-wide sidewalk on the northbound lane, and no shoulders. Current design standards require 12 feet for travel lane width, 8 feet for shoulder width, and 6 feet for sidewalk width. Therefore, the existing lane, shoulder, and sidewalk widths are considered nonstandard. No standard recovery areas exist for vehicles. Inspection of the bridge has identified the need to upgrade the existing bridge rails since they consist of nonstandard concrete short pillar or column (known as baluster) supports. Furthermore, the existing guardrails leading up to the bridge block access to the sidewalk and force users to either enter the street or use the dirt shoulder before the bridge to squeeze between railings to overcome the obstacles. The Kings Creek Bridge has been determined to be susceptible to bridge scour. Bridge scour is the removal of sediment such as sand and gravel from around bridge abutments or piers through erosion. Scour, caused by swiftly moving water, can scoop out scour holes, compromising the integrity of a structure. Scour-related issues have been observed since 1956. Footing exposure and undermining at the piers (also known as bents) have been reported since 1977, and the footings continue to be subject to scour despite repeated scour mitigation efforts. Lateral, or horizontal, migration of the channel has caused exposure and undermining of the pier footing, and most of the concrete sack slope protection at the footing washed out in 1983. The existing concrete sack slope protection on the northern bank continues to provide adequate erosion protection for the northern abutment. The existing abutments and pier currently support the existing bridge, but the bridge would need to be seismically retrofitted if the size or weight increased. Figure 1.4 provides a view of Route 9, overhead utilities, and the Kings Creek Bridge's deck, sidewalks, railing, and downdrain from the northbound shoulder just north of the bridge.

State Route 9 is a conventional two-lane, undivided highway that provides vital connectivity for rural mountain communities to the Santa Cruz coastal areas to the south and the San Francisco Bay region to the north. The route travels through the canyons of the San Lorenzo Valley, and it relies on several bridges to accommodate connections over waterways. This project covers the northernmost of the bridges over the San Lorenzo River and the northernmost bridge over a tributary (Kings Creek) to the river. The bridges were combined into one project because they serve sequential waterway crossings within a single 2-mile span and both have structural deficiencies and nonstandard features that require improvement. Mobilization to implement the necessary improvements are similar in scope and cost and could be completed with more efficiency and minimization of effects to the environment if done concurrently. This bridge project would not logically include any other bridges since the nearest bridges over the river are approximately 4 miles away to the south and were replaced in the 1980s with

standard bridge railing and wider shoulders and sidewalks. Therefore, this project will comply with the requirement to consider logical termini.

Though the project spans bridges within a 2-mile segment of State Route 9, the rational end points for construction improvements for each site were determined to be at the points where modification of the roadway and associated features is no longer required to conform with the new bridges and serve the needs of route users. The rational limits of environmental matters were determined by technical experts and identified in the technical reports prepared for this project.

The proposed improvement project will have independent utility or independent functionality, in other words, be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made. The purpose and need of the project are based on identified structural deficiencies and nonstandard features in two bridges, which provide vital, consecutive connections across waterways and ensure the serviceability of the route. The proposed replacement of the bridges and associated roadway improvements will be all that is needed to address the structural concerns and make the bridges usable without other improvements.

1.3 Project Description

This section describes the proposed action and the project alternatives developed to meet the purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are the Build Alternative and the No-Build Alternative. The Build Alternative will remove and replace both the San Lorenzo River Bridge and the Kings Creek Bridge with new single-span, structures consisting of 12-foot-standard-width lanes and 8-foot-standard-width outside shoulders with standard guardrails.

The project is located in Santa Cruz County on Route 9 at the San Lorenzo River Bridge (post mile 13.6) and the Kings Creek Bridge (post mile 15.5) in the unincorporated communities of Boulder Creek and Redwood Grove. Within the proposed project limits, State Route 9 is a conventional two-lane, undivided highway. The road rights-of-way are 80 feet wide, which would normally be 40 feet from either side of the highway centerline. Due to the mountainous nature of the area, only approximately 40 feet of the rights-of-way are available for roadway improvements without the need for significant earthwork and a large amount of pavement taper to align with the existing roadway. The route's existing road shoulders in the project area are limited to a few feet where they do exist and are considered nonstandard. There are no sidewalks besides those that exist on the two project bridges.

The existing San Lorenzo River Bridge consists of a five-span steel T-girder stringer bridge with a reinforced concrete deck that was constructed in 1937

on top of existing reinforced concrete abutments and wingwalls, which were part of the previous bridge. T-girder bridges use beams to horizontally support the deck. Stringer bridges are the simplest structural forms for bridge spans supported vertically by an abutment or pier at each end. The existing bridge structure is 106 feet long and 30.5 feet wide and consists of two 12-foot-wide lanes and two 3.25-foot-wide curbs on both sides with wooden bridge rails. Since the bridge was replaced with a wider deck to add a shoulder to the southbound lane in 1937, four additional side support columns placed between the spans next to the existing abutments were constructed on the southbound side for support.

The existing Kings Creek Bridge is a two-span reinforced concrete T-girder bridge with reinforced concrete deck and column piers. T-shaped or I-shaped beams are used in construction to strengthen the deck which is supported on one or more piers. This bridge was constructed in 1927, and concrete sack slope protection was placed in 1954. The existing bridge structure is 88 feet long and 28 feet wide and consists of two 10.6-foot-wide lanes with a 4.5-foot wide sidewalk on the northbound lane. It is fitted with concrete bridge rails.

1.4 Project Alternatives

Two alternatives are under consideration; a Build Alternative and a No-Build Alternative. The alternatives that are under consideration were developed by an interdisciplinary team. Several criteria were taken into consideration when evaluating the various alternatives for the proposed project, including the purpose and need, cost, and environmental impacts.

1.4.1 Build Alternative—Replace Existing Bridges

The Build Alternative will remove and replace both bridges with new single-span, standard-width structures consisting of 12-foot wide lanes and 8-foot-wide outside shoulders, ***as shown in Appendix F (Project Layouts and Constructions Activity Areas) of this document. The new San Lorenzo River Bridge will be 106 feet long with no increase from the existing bridge. The new Kings Creek Bridge will be 99 feet long, which is an increase of 11 feet from the existing bridge length.** New abutments designed for the new bridge decking will be constructed outside of the waterways to eliminate scour concerns. Existing abutments will be removed where feasible and necessary for new abutment work. ***The new bridges will only have foundations at the new abutments as opposed to the existing bridges that are multi-span and have foundations within the waterway.** Existing metal beam guardrail will be removed and replaced with a standard Midwest Guardrail System, which will be connected to the bridge rail by Midwest Guardrail System Transition Railing Type WB-31. A taper will be paved on each side of the bridge to transition the new 8-foot-wide bridge shoulder to the existing roadway

shoulder. ***The existing roadway pavement, 150 feet from each side of the existing bridges, will be resurfaced.**

The first conception of the Build Alternative in the Project Initiation Report considered a proposed design of minimum 4-foot-wide outside shoulders and standard 6-foot-wide raised-curb sidewalks (total bridge width of 44 feet) since limited developable area exists. This proposal would have required approval of a substandard design for the shoulder. Including standard 8-foot shoulders would have increased the total for each bridge to 52 feet which far exceeds the currently available buildable area of approximately 40 feet in width. Apart from the existing bridges, there are no other sidewalks in the area. Though sidewalks would improve pedestrian passage over the bridge, if constructed, they would be isolated features with no connections to any nearby sidewalks. The Project Development Team implemented a design modification to replace the existing substandard sidewalks and shoulders with standard 8-foot-wide outside shoulders on the new bridges instead of the originally considered 4-foot-wide outside shoulders and standard 6-foot-wide raised-curb sidewalks. This will only result in new bridge widths of 40 feet. This design will satisfy standard requirements and serve the function of providing enough area for pedestrians, bicycles, and vehicle recovery without significantly increasing the project footprint or constricting movement.

Work in the streambeds is proposed and will require use of a temporary diversion system to dewater work areas for demolition and removal of existing bridge abutments, supports, and decking. It is expected that all work will occur within the existing state ***and County road** rights-of-way, and no new right-of-way will be necessary, ***as shown in Appendix F (Project Layouts and Constructions Activity Areas) of this document.** The proposed bridges will be constructed along the existing State Route 9 alignment.

Caltrans Standard Specifications and Special Provisions

This project contains standardized project measures (Caltrans Standard Specifications and Special Provisions) that are used on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the proposed project. These measures are included as project features and addressed in more detail in the Environmental Consequences sections found in Chapter 2 when appropriate.

- 7-1.01 (Legal Relations and Responsibility to the Public—General)
- 7-1.01G (Water Pollution)
- 7-1.02K(6)(j)(ii) (Lead Compliance Plan)
- 7-1.02K(6)(j)(iii) (Earth Material Containing Lead)
- 7-1.03 (Public Convenience)
- 10-5 (Dust Control)

- 12-1 through 12-7 (Temporary Traffic Control)
- 14-2.03A (Archaeological Resources—General)
- 14-6.04 (Wetland Protection)
- 14-8.02 (Noise Control)
- 14-9.02 (Air Pollution Control)
- 14-10.01 (Solid Waste Disposal and Recycling—General)
- 14-10.02 (Solid Waste Disposal and Recycling Report)
- 14-11 (Hazardous Waste and Contamination)
- 14-11.13B(2) (Debris Containment and Collection Plan)
- 84-9.03C (Remove Traffic Stripes and Pavement Markings Containing Lead)
- A Transportation Management Plan will be prepared for the project.

Operational Effects

Operational effects of the proposed project will be beneficial and result from bridge design improvements. Increased lane and outside shoulder width will provide more room for vehicle emergency recovery. Construction of 8-foot-wide outside shoulders will improve bicycle and pedestrian access by providing additional space for movement across both bridges.

Construction Effects

Caltrans will implement traffic control measures to reduce vehicle travel to single-lane, bidirectional flow at each bridge site. This will allow for partial demolition of existing bridges and new construction to occur one bridge lane at a time. Construction of both bridges will be done concurrently and will occur in three stages. The first stage will coincide with demolition and replacement of the southbound bridge lane (west side) of each bridge. Stage 1 will start in early May of 2022 and will be completed in late September 2022. Stage 2 will demolish and replace the northbound bridge lane (east side) at each location. It will begin the next year in early May and will be completed by early October. At the completion of Stage 2, traffic control will be removed and both bridge lanes will be reopened to travel. Stage 3 will complete any remaining project site cleanup, restoration work, and mitigation. Construction activities during each stage will generally be the same at both bridge sites and are described here. The locations of potential construction impacts for the San Lorenzo River Bridge and Kings Creek Bridge are shown on Figure 1.5 and Figure 1.6 ***and in Appendix F (Project Layouts and Constructions Activity Areas) of this document.**

Stage 1

Stage 1 will begin with preconstruction surveys and the placement of environmental sensitive area fencing as needed. Traffic control measures

described below will be implemented to reduce traffic to one lane for the protection of equipment staging and work areas. As needed, preparation of the project sites will then start with vegetation removal, access road construction, dewatering activities, and installation of scaffolding and falsework for work platforms and debris collection. Before or during this time, any utilities in conflict with the project will be relocated out of the work area in coordination with the utility owner.

Bridge decking and railing on the southbound lane will first be demolished and removed. Excavation for the west half of the new bridge abutments will occur behind the existing abutments. Portions of the existing abutments in conflict with the girders for the new bridge will then be removed. Construction of the new abutments will involve material removal, drilling, and concrete work for footings, stems, and wingwalls. At the Kings Creek Bridge site, a 120-foot long retaining wall will be constructed at the southwest end. The new retaining wall will be constructed below the level of the roadway and will not be readily visible to the traveling public. The concrete barrier will be treated to visually recede and appear consistent with the natural, wooded character of the project site. Once the abutments are complete, 100-foot-long wide-flange steel girders will be placed to span the gap between the abutments to provide support for the new bridge decking. The method of girder placement will be determined by the contractor but could be accomplished through many methods like lifting by crane or launching by counterweight or gantry. This will require intermittent full closures of the route as described under Traffic Control below.

Prefabricated fiber reinforced polymer decking will be installed for the southbound lane and secured to the abutments and girders. Bridge railing and pavement will be installed onto the new deck. A temporary pedestrian walkway will be connected to the west side of the structure or falsework. ***Starting 150 feet away from the new bridges, the southbound lane roadway approaching and departing the decks will be reconstructed, striped to widen the shoulder, and tapered to match the new bridge deck pavement elevation and width. At the San Lorenzo River Bridge, a small amount of pavement work in the existing County road rights-of-way for Riverdale Boulevard, where it meets with Route 9, will be necessary to construct a smooth transition through the intersection.** In coordination with the Santa Cruz Metro, Caltrans will widen the shoulder and construct a new bus pad at the existing bus stop along the southbound shoulder approximately 300 feet to the north of the San Lorenzo River Bridge. This will allow for future construction under an encroachment permit of a shelter and bench by Santa Cruz Metro should they pursue it in the future.

Guardrails will then be installed. Alternate crash cushion will be installed to the new Midwest Guardrail System at the southwest end of the Kings Creek Bridge. Southwest of the new San Lorenzo River Bridge, a buried post end anchor will be installed at the end of the new Midwest Guardrail System. At

the end of the stage, all falsework and scaffolding will be removed from below the Ordinary High Water Mark of the waterways.

Stage 2

Stage 2 will also begin with preconstruction surveys and the placement of environmental sensitive area fencing as needed. Traffic control will shift traffic to the newly constructed southbound lane (west side) for work to begin demolishing and reconstructing the northbound (east side) bridge deck. As needed, preparation of the project sites will then start with vegetation removal, access road construction, dewatering activities, and installation of scaffolding and falsework for work platforms and debris collection. Before or during this time, any utilities in conflict with the project will be relocated out of the work area in coordination with the utility owner.

Bridge abutment construction, girder placement, deck and railing installation, paving, and road reconstruction of the northbound lanes will occur as previously described for Stage 1. Approximately 80 feet of retaining wall will be constructed near the northeast corner of the new San Lorenzo Bridge, and a 35-foot-long retaining wall will be constructed at the southeast end of the new Kings Creek Bridge. The new retaining walls will be constructed below the level of the roadway and will not be readily visible to the traveling public. The concrete barriers will be treated to visually recede and appear consistent with the natural, wooded character of the project site. At the Kings Creek Bridge, alternate crash cushion will be installed at the southeast end of the new Midwest Guardrail System. At the San Lorenzo River Bridge, alternate crash cushion will be installed to the newly constructed bridge rail on the southeast side.

Stage 3

Stage 3 will involve end of construction activities like material removal, site restoration, and revegetation. The temporary pedestrian walkway on the west side will be removed along with any remaining falsework and scaffolding. Traffic control measures will also be removed, and all lanes will be reopened to travel.

Work Schedule

The project is estimated to have a duration of 386 working days, but the project could take up to three consecutive years to complete due to environmental schedule constraints. Diversions will need to be in place at both Kings Creek and San Lorenzo River for an estimated 180 working days at each location. Because the working limits for in-water work are constrained to the dry season from June through October, the 180 working days will take several seasons to complete.

Traffic Control

During project construction, both traffic lanes before the bridges will be temporarily reduced to one travel lane with a minimum width of 10 feet for both northbound and southbound traffic. Temporary traffic signals will control the alternating one-way traffic flow to minimize delay and regulate traffic. The project will coordinate traffic control measures along with signal timing and placement to provide access precedence to local properties owners and residents in the project area. These efforts will allow travel through the project site in both directions and property access while project construction is in progress. Lane reductions will require temporary concrete barriers on the roadway and construction warning signs between the project limits. Temporary concrete barriers will be installed before construction starts. A temporary pedestrian pathway will be constructed to allow passage across each bridge during each stage of construction.

Full-traffic closures lasting for up to 6 hours at a time, near project locations, will be required during girder placement and bridge demolition. The full closures will be scheduled during late night hours and/or during weekends. No viable detour will be available during full traffic closures. The only detour option available is through Route 236 that would add an estimated one hour to commute times. Measures to accommodate emergency traffic during full closures will be considered. The proposed project will coordinate and notify regional emergency service providers of construction-related activities to provide advance notice and to allow for planning. Emergency service providers will be notified of any project activities that may have the potential to restrict or prevent emergency service access within the project area. Emergency access to all interconnecting roadways and routes within the project area will be maintained during construction. Also, Caltrans will coordinate with the local transit provider to temporarily relocate the bus stop located north of the San Lorenzo River Bridge, as needed, and to provide information in advance to allow for route rescheduling.

Construction and Demolition Equipment

The following equipment will likely be used during construction.

- **asphalt paver** for asphalt delivery and placement
- **backhoe** for various soil manipulation activities
- **roller paver** for bridge superstructure construction
- **bobcat** for pavement, earthwork, and clearing and grubbing
- **bulldozer and front loader** for earthwork and clearing and grubbing
- **compressor** for bridge construction
- **concrete pump** for pavement and structure construction
- **concrete roller screed** for pavement construction

- **concrete truck mixer** for pavement, structure, and flatwork construction
- **concrete saw** for pavement construction
- **crane** for lifting, support, and placement
- **dump truck** for earthwork and hauling
- **demolition equipment** to remove structures
- **excavator** for soil manipulation
- **flatbed truck** for various construction activities
- **forklift** for various construction activities
- **grader** for ground leveling
- **haul truck** for earthwork and clearing and grubbing
- **paint and striping truck** for pavement striping and delineation
- **manlift** for bridge superstructure construction
- **drill rig** for bridge foundation construction
- **pump truck** for bridge structure construction
- **ready-mix concrete truck** for concrete delivery
- **roller and compactor** for earth work
- **scraper** for earthwork and clearing and grubbing
- **shoulder paver** for pavement construction
- **sweeper and broom** to clean the roadway
- **truck with seed sprayer** for landscaping and erosion control
- **water truck** for earthwork and dust control

Access and Equipment Staging Areas

Access into the San Lorenzo River and Kings Creek will be required. Access to the streambed and equipment staging areas at the San Lorenzo River Bridge are proposed in regions northwest and southeast of the bridge. Access to the streambed at the Kings Creek Bridge is proposed in a region southeast of the bridge, while the equipment staging area is proposed within the state right-of-way to the northwest of the bridge. The work will only occur in waterways between June 1 and October 31, when flows are anticipated to be lowest. Creek diversions will likely be required and will consist of a series of pipes sized appropriately to the flow of water, or an alternate method. ***Figure 1.5, Figure 1.6, and Appendix F (Project Layouts and Constructions Activity Areas) of this document show proposed creek access and equipment staging areas.

To gain access, water will be temporarily diverted around the work area using a series of pipes, sized appropriately to the flow of water, and cofferdams up- and downstream of the area to be dewatered. A maximum of 82 linear feet of the San Lorenzo River will be diverted to complete the project. A maximum of 79 linear feet of the Kings Creek will be diverted to complete the project.**

Work in and above the waterway will consist of falsework, placing netting or platforms to catch the debris during the removal of existing bridges, constructing the abutment foundations of the new bridges, removing the existing bridge abutments, side support columns, piers, and foundations, as feasible. ***Because the existing abutments at both bridges were constructed by casting materials directly into the exposed bedrock within the stream channel, the abutments will be partially removed in an effort to minimize removal of bedrock and alteration of the stream channel. Abutments and side support columns at the San Lorenzo River Bridge will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. Future design plans are anticipated to provide greater detail on existing abutment removal. At the Kings Creek Bridge, a portion of existing sacked concrete (0.049 acre), located approximately 10 feet above the Ordinary High Water Mark, along the existing northern abutment, will be replaced with rock slope protection. The existing pier located below the Ordinary High Water Mark will be removed to approximately 3 feet below original grade.**

This work will require trenching, ground compaction, and vegetation clearing for access roads, equipment staging, and work areas. Tree and vegetation removal activities are expected, and all disturbed areas and temporary access roads will be revegetated once work is complete.

Utility Relocation

An 8-inch-wide water pipeline on the west side and an abandoned 4-inch-wide pipe on the east side, both owned and operated by the San Lorenzo Valley Water District, run underground along the route and are connected to the bridge deck at both project locations. AT&T buried fiber optic lines are parallel to the roadway on the east side and run under the decks of both bridges. At the San Lorenzo Bridge, aerial electrical powerlines owned by the Pacific Gas and Electric (known as PG&E) Company travel parallel to the route and cross the river on the west side of the bridge. The same aerial electrical powerlines move from the west side of the route over to the east side as they cross the creek over the bridge. A Comcast aerial fiber optic cable line runs parallel to the route on the east side at both sites. AT&T aerial telephone lines are along the route shoulder on the east side of the San Lorenzo River Bridge and the west side of the Kings Creek Bridge.

Temporary and permanent utility relocation will be required to move communication and water lines currently attached to the bridges, as well as to move overhead power and communication lines to areas that are outside of

the bridge construction footprints. Existing utilities that would conflict with construction operations will be relocated in stages during construction. Caltrans will coordinate with utility providers to relocate utility lines with minimal service disruption and will provide funds for the state share of relocation costs. Caltrans is currently working through the utility Request for Claim process and has not established the liability with each utility owner on the project yet. However, it is likely that owners do not have prior rights since State Route 9 is a conventional highway, and utilities on these facilities are typically installed by permit. If it is established that owners have prior rights within the right-of-way then Caltrans will provide the necessary state share of funds for relocation.

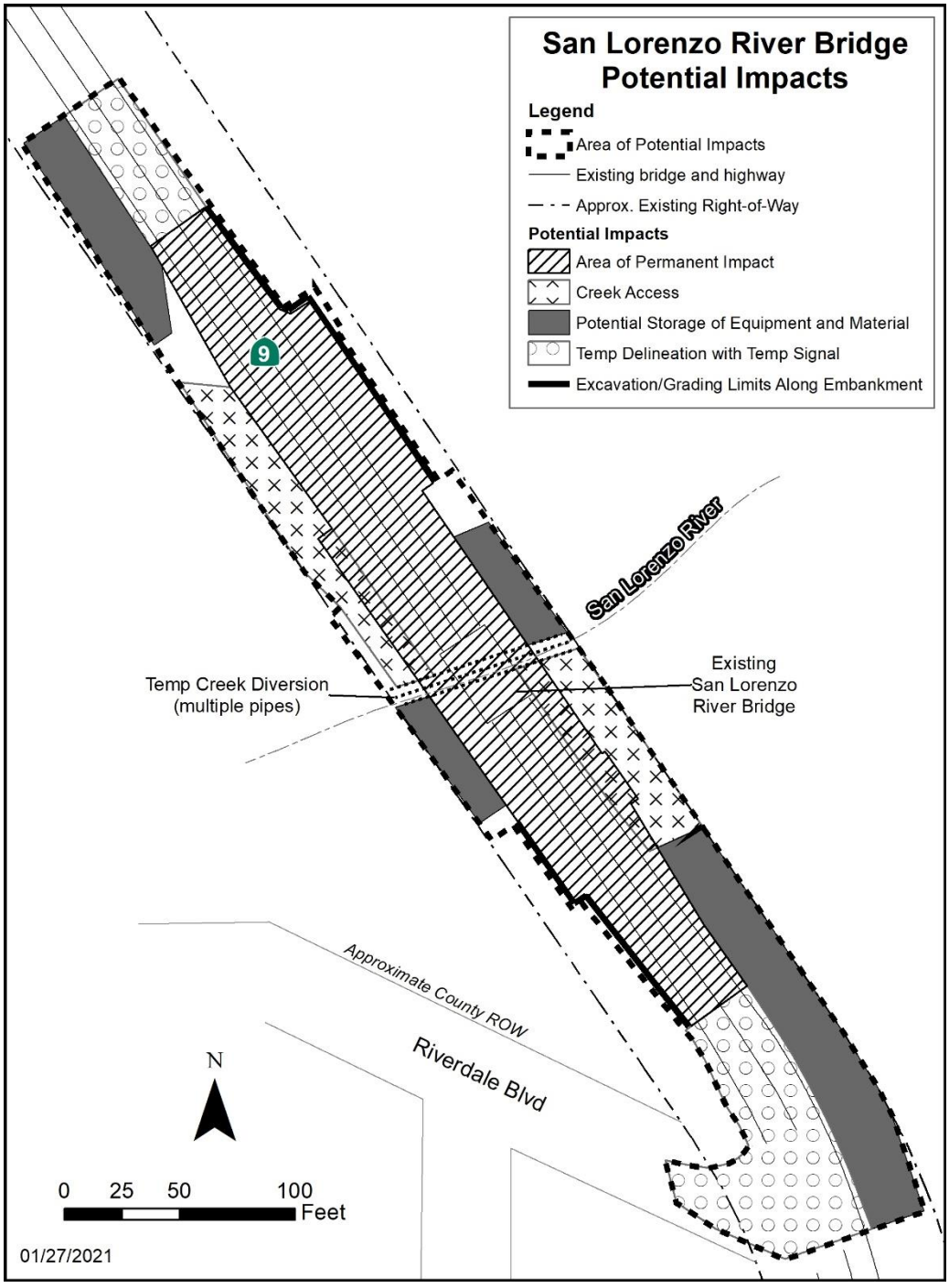
Highway Planting, Landscape Vegetation, and Erosion Control

There is no existing highway planting within the project limits. The surrounding landscape is mostly naturally vegetated. Private property owners may have planted within the rights-of-way. Planting is expected to replace removed trees and reduce visual impacts. Work will include planting and temporary irrigation. The plant establishment period will be one year. The final scope and locations of work will be refined in coordination with the project biologist when commitments to the various regulatory agencies are resolved. Permanent erosion control may include rolled erosion control product netting, hydro seed, and other components. Components will be selected to best address varied conditions within the project. Seed mix will include a combination of native species selected in coordination with the project biologist and regulatory agencies involved.

1.4.2 No-Build (No-Action) Alternative

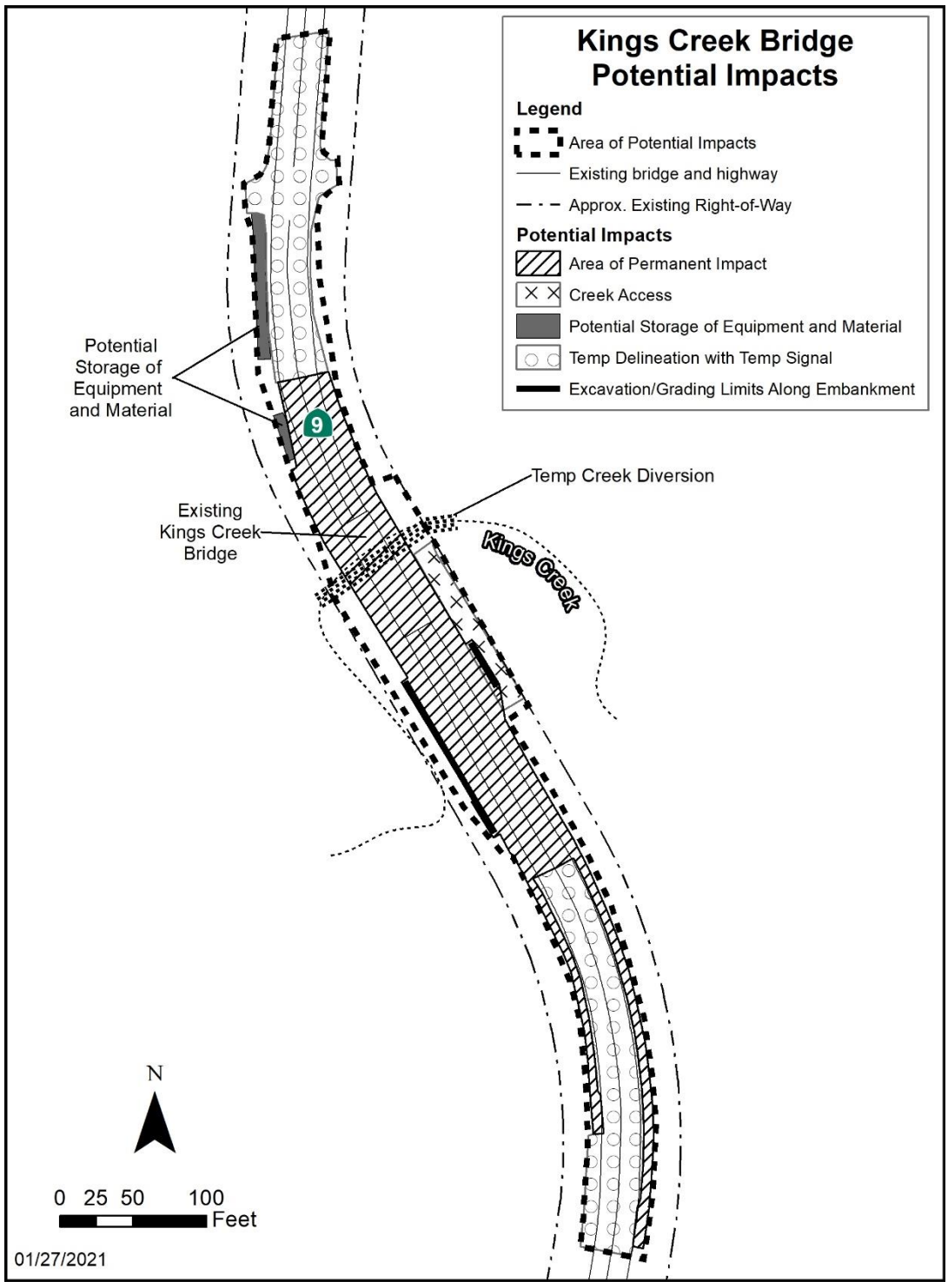
Under the No-Build Alternative, the San Lorenzo River Bridge and Kings Creek Bridge would not be replaced. No widening of existing lanes or shoulders would occur. Structural deficiencies would not be improved. Both bridges would continue to deteriorate and not meet design standards for guardrails, sidewalks, and shoulders. The Kings Creek Bridge would continue to not meet design standards for required 12-foot-wide lane widths. No other improvements would be constructed on the San Lorenzo River Bridge or Kings Creek Bridge under the No-Build Alternative. However, routine maintenance would continue.

Figure 1.5 San Lorenzo River Bridge Potential Construction Impacts



***The reader should note that this figure has changed since the draft document.**

Figure 1.6 Kings Creek Potential Construction Impacts



***The reader should note that this figure has changed since the draft document.**

1.5 Comparison of Alternatives

When alternatives are evaluated, the purpose and need of the project, as well as the locations where environmental impacts could occur, need to be considered.

The Build Alternative will satisfy the purpose of the project because it will improve the structural deficiencies and nonstandard features of the San Lorenzo River Bridge and the Kings Creek Bridge by replacing the existing bridges with new bridge structures. The Build Alternative will satisfy the need of the project because it will remedy the structural deficiencies of rust, concrete cracking, and erosion, and it will ensure the serviceability of State Route 9 in the area. The Build Alternative will comply with Caltrans design standards by providing standard guardrails and 8-foot-wide outside shoulders. It will also provide 12-foot-wide standard lane-widths at the new Kings Creek Bridge, where they are currently 11.5 feet wide. It will result in temporary and permanent impacts to environmental resources. Construction activity will be required within the San Lorenzo River and Kings Creek, with the potential to affect biological resources and water quality. Although the Build Alternative will result in changes to existing conditions, the results of analysis indicate that these changes will not be substantial. Chapter 2 (Affected Environment) of this environmental document provides discussions regarding the proposed project's potential environmental impacts.

The No-Build Alternative would not satisfy the purpose or need of the proposed project because it would not address the structural deficiencies of the existing San Lorenzo River Bridge and Kings Creek Bridge or ensure the function and reliability of this link in the California transportation system. The No-Build Alternative would not result in any construction or changes to existing conditions. Therefore, it would not result in any temporary or permanent impacts to environmental resources.

1.6 Identification of a Preferred Alternative (added to Final Environmental Document)

***A Build Alternative and a No-Build Alternative were the only alternatives considered for this Initial Study with Mitigated Negative Declaration and Environmental Assessment with Finding of No Significant Effect. After public circulation of the Draft Initial Study with Proposed Mitigated negative Declaration and Environmental Assessment, the two alternatives were further evaluated. Caltrans identified the Build Alternative as the preferred alternative after consideration of the project's purpose and need, funding, schedule, construction methods, and its potential to impact environmental resources. Under the California Environmentally Quality Act, no unmitigable significant adverse impacts were identified for the Preferred Alternative, so Caltrans has prepared a Mitigated negative Declaration. Similarly, Caltrans as assigned by

the Federal Highway Administration, has determined that the National Environmental Policy Act action does not significantly impact the environment, so Caltrans has issued a Finding of No Significant Impact.

The preferred alternative meets the purpose and need of the project. This alternative will address the structural deficiencies of the existing bridges caused by rust, scour, and concrete cracking and improve the nonstandard features by replacing the existing structures with new bridges having standard bridge guardrails and standard widths for lanes and shoulders. The potential for scour will be reduced through new bridge designs that remove supporting foundations from the active channel.

The preferred alternative will result in temporary and permanent impacts to environmental resources. The project will result in temporary impacts due to construction disturbance, which will be offset by construction monitoring and post-construction restoration. The project will result in minor permanent impacts from the widening of the roadway tapers leading up to both sides of the bridges to conform the existing highway shoulders with the new bridge width. However, the new structural features constructed by the project will also provide environmental benefits by removing piers from the Kings Creek waterway and increase available riparian and designated Critical Habitat for special-status fish species. The preferred alternative will include Caltrans standard plans and measures that are applicable to the project in order to address any temporary and permanent impacts associated with the project.

Caltrans has determined that the No-Build Alternative will not satisfy the project's purpose and need because it would not address the superstructure and substructure deficiencies and remedy the nonstandard conditions of the existing San Lorenzo River Bridge and Kings Creek Bridge. The No-Build alternative will not be able to ensure the reliability and functionality of the existing bridge structures to serve as components of the State's highway system.**

1.7 Alternatives Considered but Eliminated from Further Discussion ***Prior to the Draft Initial Study/Environmental Assessment**

This project was initially proposed as an upgrade of existing non-standard barrier rails to traffic-rated concrete barriers. Three construction alternatives (Alternatives 1, 2, and 3) were also considered at the same time, but Alternatives 1 and 2 were eliminated before preparation of the draft environmental document. The proposed Build Alternative was originally identified as Alternative 3. A description of each eliminated alternative and the reason for elimination from consideration by the Project Development Team are provided below.

1.7.1 Alternative 1: Replace Non-Standard Bridge Railing and Construct Standard Sidewalk on Existing Bridges

Alternative 1 proposed to replace the existing non-standard barrier rails with traffic-rated concrete barriers. This alternative would have involved slightly widening the bridges to widen travel lanes to 12 feet in both directions, replace existing the sidewalks with 6-foot-wide sidewalks in both directions, and replace 100 feet of approach roadway on both sides. It may have required new bridge substructure and foundations due to weight load and seismic demands.

This alternative was rejected because it did not fully resolve the superstructure and foundation deficiencies in the bridges; and new foundations for existing abutments and piers would likely increase human-made features in the streambed resulting in a reduction of critical habitat area and encroachment upon a designated floodway. In contrast, the proposed Build Alternative would remove existing human-made features from the streambed and increase critical habitat area. A Design Standard Decision Document for nonstandard shoulder widths would have been required. Also, the cost analysis for the project indicated that this alternative would not provide the lowest agency life-cycle cost.

1.7.2 Alternative 2: Replace Non-Standard Bridge Railing, Construct Standard Sidewalk, and Provide Shoulder Widening on Existing Bridges

Alternative 2 proposed to replace the non-standard bridge railing, widen travel lanes to 12 feet in both directions at Kings Creek, construct 4-foot-wide shoulders on both sides, replace the existing sidewalks with 6-foot-wide sidewalk, and replace 150 feet of approach roadway. New foundations for both abutments and piers would have to be supported on spread footings or Cast-In-Drilled-Hole concrete piles, depending on weight loads and seismic demands.

This alternative was rejected because new foundations for existing piers and abutments would likely increase human-made features in the streambed resulting to a reduction of critical habitat area. New human-made features that would be constructed in the streambed for additional foundation support would obstruct water flow and encroach upon a designated floodway. In contrast, the proposed Build Alternative would remove existing human-made features from the streambed and increase critical habitat area. A Design Standard Decision Document for nonstandard shoulder widths would have been required. Also, the cost analysis for the project indicated that this alternative would not provide the lowest agency life-cycle cost.

1.8 Permits and Approvals Needed

The following permits, licenses, agreements, and certifications are required for project construction:

Table 1.1 Permits and Approvals Needed

Agency	Permit/Approval	Status
U.S. Army Corps of Engineers	Clean Water Act Section 404 Permit: Waters of the United States, ***Nationwide Permit and Pre-Construction Notification**	Pending: Application submittal expected by April 1, 2021.
Central Coast Regional Water Quality Control Board	Clean Water Act Section 401 Permit: State Certification of Water Quality	Pending: Application submittal expected by April 1, 2021.
California Department of Fish and Wildlife	Section 1602 Streambed Alteration Agreement	Pending: Application submittal expected by April 1, 2021.
California Department of Fish and Wildlife	Section 2081 Take Permit	Pending: Application submittal expected by April 1, 2021.
National Marine Fisheries Service	Biological Opinion ***and Incidental Take Statement**	***Received on December 23, 2020.**
***County of Santa Cruz**	***Encroachment Permit**	***Pending: Application submittal expected by April 1, 2021.**

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

As part of the scoping and environmental analysis done for the project, the following environmental issues were considered, but no adverse impacts were identified. So, there is no further discussion of these issues in this chapter of document.

- **Coastal Zone**—Based upon the Santa Cruz County Coastal Zone map, the project is located outside the designated coastal zone. The bridges are approximately 500 feet above mean sea level and are 13 and 15 miles inland from Monterey Bay. Effects to coastal resources are not expected as a result of this project.
- **Community Character and Cohesion**—The project will not affect the character or cohesion of the community because it involves only replacement and minor enhancement of the existing bridges and minor enhancement of an existing bus stop. It will not physically divide any existing communities. Therefore, no direct or indirect impacts related to community character and cohesion will occur. (Sources: *County of Santa Cruz General Plan and Town Plan*)
- **Consistency with State, Regional, and Local Plans and Programs**—The project is included in the 2018 Federal Statewide Transportation Improvement Program and is proposed for funding from the State Highway Operation Protection Program. It is also included in the Association of Monterey Bay Area Governments 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy and the cost-constrained 2018 Metropolitan Transportation Improvement Program and is listed under the State Highway Operation Protection Program Grouped Project Listing—Bridge Rehabilitation and Reconstruction. The route is identified as a vital transportation corridor on state, regional, and local plans. (Sources: *County of Santa Cruz General Plan and Town Plan*; 2018 Federal Statewide Transportation Improvement Program; Association of Monterey Bay Area Governments 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy; 2018 Metropolitan Transportation Improvement Program; December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report)
- **Environmental Justice**—The project will not have any negative impacts regarding environmental justice. The draft Initial Study with Proposed Mitigated Negative Declaration will be circulated and made available to the public for review and comment. The proposed bridge replacement will

benefit all people regardless of race, color, national origin, or income by providing continued access to the communities along the route. No minority or low-income populations that will 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. (Source: *County of Santa Cruz General Plan and Town Plan*)

- **Farmland**—According to the California Department of Conservation's Farmland Mapping and Monitoring Program, no farmlands or vacant lands that have been mapped as Prime Farmlands, Unique Farmlands, Farmlands of Statewide Importance, or Farmlands of Local Importance occur within the vicinity of the project. There are no lands designated as farmland in the vicinity according to the local general plan. Therefore, the project will not impact farmland (Sources: California Department of Conservation's Farmland Mapping and Monitoring Program; *County of Santa Cruz General Plan and Town Plan*)
- **Existing and Future Land Use**—The land uses around the project area are identified as a mix of residential and neighborhood commercial. The project will not permanently alter existing or future accessibility. All construction and demolition work will occur within the existing state ***and County road** rights-of-way. The project is not expected to change or affect any existing or future land uses in the area as a result of the project. (Sources: *County of Santa Cruz General Plan and Town Plan*; December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report)
- **Growth**—The project will not alter existing roadway or public transit capacity and is limited to replacing the existing bridges and providing minor enhancement to an existing bus stop (see Chapter 1). The project will not alter existing or future accessibility in the region or influence growth. Therefore, no direct or indirect effects related to growth will occur. (Source: *County of Santa Cruz General Plan and Town Plan*)
- **Mineral Resources**—No known mineral resources exist at the project location, nor will the project interfere with any known mineral resource availability. No locally important mineral resource recovery sites are located within the project area, nor will the project 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. Therefore, the project will not impact mineral resources. (Source: *County of Santa Cruz General Plan and Town Plan)*
- **Paleontology**—The potential for encountering paleontological resources within the project limits during proposed work activities is remote; therefore, no direct or indirect effects on paleontological resources are expected to occur. (Source: November 2020 Paleontology Scoping Review)

- **Parks and Recreational Facilities**—No parks or recreational facilities will be affected by the proposed project. (Sources: publicly available mapping; *County of Santa Cruz General Plan and Town Plan*; December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report)
- **Plant Species**—Although potential habitat for several special status plant species occurs within the biological study areas, no special status plant species were seen during field surveys, and none are expected to occur within the project area. Therefore, the project is not expected to affect any special status plant species. Impacts to non-special status plant species will occur from tree and vegetation removal for temporary access and staging areas. These areas will be revegetated and returned to a natural state once construction activities are complete. (Source: 1H470 December 2020 Natural Environment Study)
- **Public Services**—The project will not require the alteration or creation of facilities related to fire protection, police protection, public schools, public parks, or other public facilities. Therefore, the project will not impact public services. (Sources: publicly available mapping; *County of Santa Cruz General Plan and Town Plan*; December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report)
- **Relocations and Real Property Acquisition**—No real property acquisition or relocations are expected for this project. (Source: December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report)
- **Section 4(f)**—There are no historic sites, parks, recreational resources, wildlife refuges, or waterfowl refuges, which meet the definition of a Section 4(f) resource, within the project area. Therefore, this project is not subject to the provisions of Section 4(f) of the Department of Transportation Act of 1966. (Sources: publicly available mapping, *County of Santa Cruz General Plan and Town Plan*; December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report)
- **Wild and Scenic Rivers**—The project is not near any waterways that have been officially designated and listed in the National Wild and Scenic Rivers System or the California Wild and Scenic Rivers System. No impacts to this resource will occur. (Sources: National Wild and Scenic River System, accessed January 3, 2020. Available at https://www.rivers.gov/map.php; and California Public Resources Code Section 5093.53)

2.1 Human Environment

2.1.1 Timberlands

Regulatory Setting

Impacts to timberland are analyzed as required by the California Timberland Productivity Act of 1982 (CA 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 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 right-of-way from a Timber Production Zones will be required for a transportation project.

Affected Environment

The U.S. Forest Service defines a forested area as forest land if it is at least one acre in size and at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest use. Non-forest uses may include cropland, pasturelands, residential areas, and other land uses. Furthermore, Section 12220(g) of the California Public Resources Code defines forest land as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. The *County of Santa Cruz General Plan and Town Plan* considers a land's potential to produce timber when determining allowed land use and the resulting impacts to resources.

According to Santa Cruz County Zoning Maps, forested lands and timberland occupy a large portion of the County with most areas of timber production in the Santa Cruz Mountains. The Timber Production zoning district extends across 71,306 acres of Santa Cruz County, mostly in the North Coast and Mountain Regions. The lands within Timber Production Zones surround the project sites and are over a mile away. Developed and undeveloped residential areas are between the project sites and the timber production areas. The project sites and most of the surrounding private properties are vegetated with forest trees but are considered developed for non-forest uses.

Environmental Consequences

As discussed in Section 1.4.1 (Build Alternative) and Section 2.3.1 (Natural Communities), tree removal will be required for bridge access and utility relocation during construction and demolition. The number of trees that will need to be removed is not known at this time. Compensatory mitigation measures identified in Section 2.3.4 (Threatened and Endangered Species) for Central California Coast Coho Salmon Critical Habitat will require tree and

shrub replacement in accordance with regulatory agency permit conditions. Tree removal will be considered a temporary impact to forest trees, but it will not affect timber production or lands in Timber Production Zones. Permanent impacts to forest trees will result from the loss of 0.237 acre of unpaved road shoulder and California Coast redwood forest understory that will be paved to support a road taper from the existing alignment to the newer, wider bridges. The proposed project will not require any right-of-way or property from lands identified within a Timber Production Zone per the California Timberland Productivity Act of 1982. According to the Santa Cruz County General Plan and associated mapping, the project will likely not affect any lands designated or zoned for timber production.

Avoidance, Minimization, and/or Mitigation Measures

Since potential impacts to timberlands and forest lands will be less than significant, no mitigation is required.

2.1.2 Visual/Aesthetics

Regulatory Setting

The National Environmental Policy Act 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 United States Code 4331[b][2]). To further emphasize this point, the Federal Highway Administration, in its implementation of National Environmental Policy Act (23 United States Code 109[h]), directs that final decisions on 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.

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

California Streets and Highways Code Section 92.3 directs Caltrans to use drought resistant landscaping and recycled water when feasible and incorporate native wildflowers and native and climate-appropriate vegetation into the planting design when appropriate.

Affected Environment

The information and analysis contained in this section are based on the Visual Impact Assessment by Caltrans in May 2020 for the proposed project.

Existing Visual Environment

State Route 9 throughout the project limits is a mostly two-lane curved roadway through a heavily forested landscape. Although this portion of the

route is not within the Designated Scenic Highway limits, it is identified as Eligible in the State Scenic Highway Program. The Eligible listing is based largely on the area's naturally vegetated rural character. Scenic vistas throughout the project area mostly include close-up to mid views of steep topography and hillsides, streamside areas, native vegetative patterns, and mostly undeveloped landscapes. The community of Boulder Creek and surrounding residential neighborhoods, as well as the highway itself, also contribute to the overall character of the site and its surroundings.

The highway passes through the outskirts of the city of Santa Cruz, the most developed section along the corridor, as well as the small communities of Boulder Creek, Felton, and Ben Lomond. Even in the more developed areas, the vegetated character is present and contributes greatly to the visual quality of the highway. The San Lorenzo River generally flows parallel to the highway. Although the river is sometimes relatively close to the roadway, it generally does not have a high degree of noticeability for the highway traveler because of intervening vegetation and topography. Existing paved shoulder widths along the corridor generally range from zero to four feet. Retaining walls are seen occasionally along the curved roads and steep topography of the area. Both metal-beam and concrete type barriers are seen along the route.

Both bridge sites are near the unincorporated community of Boulder Creek in the Santa Cruz mountains. The San Lorenzo River Bridge is closer to the commercial core of Boulder Creek, and Kings Creek Bridge is in the Redwood Grove neighborhood. With a population of under 5,000 people, Boulder Creek is considered the gateway town to Big Basin Redwoods State Park. The bridges are surrounded by rural residential land uses within California coastal redwood forest. The San Lorenzo River flows through a highly confined valley with very steep slopes on either side extending up to the roadway elevation above. The streamside areas are vegetated with coast redwood (*Sequoia sempervirens*), red alder (*Alnus rubra*), sycamore (*Plantanus racemosa*), and tanoak (*Notholithocarpus densiflorus*) trees. The Kings Creek banks are steep with the slope of the bank becoming more gradual downstream from the bridge. There is a vertical concrete retaining wall that extends along the right bank upstream and the entire right bank is developed with existing concrete sack slope protection. The streamside areas are predominated by non-native blackberry and English ivy. Downstream of the bridge, it is vegetated with native species, including red alder trees and thimbleberry. ***There are no artificial light sources at either bridge site.**

Viewer Sensitivity

Santa Cruz County and the communities along State Route 9 have a history of being concerned about visual issues and have demonstrated interest in preserving the rustic character of the route. Community involvement is expected in the development of the visual treatments of the bridge rails, to be

further developed and approved by Structure Design in conjunction with District Five Landscape Architecture.

Environmental Consequences

Proposed project elements such as widened shoulders, metal guardrails and transitions, concrete barriers, and new bridge rails will be readily visible from the roadway. By themselves, these types of elements are not uncommon and are not considered unexpected visual elements in a highway setting. The new guardrails and bridge rails will be slightly taller than the existing guardrails and bridge rails. Depending on the height of the driver's viewing position, views from the roadway to the streamside areas could be affected to some degree by the bridge rail. These changes will result in a somewhat more engineered appearance of the highway facility. As a result, these visual changes will cause a minor reduction of rural character and visual quality to the immediate project area.

The existing overhead utility lines and poles that are on both sides of the highway will be relocated farther away from the roadway. The poles and lines will still have a backdrop of vegetation so that the change will be largely unnoticed by the casual observer. The proposed retaining walls will be parallel to and lower than the elevation of the highway, thus the visibility of the walls from the highway is not expected. ***No new artificial light sources will be installed by this project.**

Although some existing trees and other plants will be removed by the project, vegetation removal will be fully replaced and established. It is anticipated that a one-year plant establishment period will be required. As a result, the streamside areas will over time be fully revegetated and result in a somewhat natural appearing visual condition. Construction access roads and areas of demolition, when restored to natural-appearing landforms will reduce the noticeability of disturbance and engineered alterations.

As a result of these changes, the highway environment in the immediate project vicinity will be somewhat altered, although the effect on the scenic vistas will be minimal. Although visual changes will occur, the same type of elements proposed with this project are seen elsewhere along State Route 9 and are not by themselves inconsistent with the rural roadway character of the region. The roadway north and south of the project site will remain unwidened. As a result, the proposed widened shoulders and new bridge rails will be subordinate to the overall experience of traveling along the route.

It is expected that following project construction and revegetation, the project will be generally unnoticed by the casual observer on State Route 9. If noticed, the project will not appear out of place with the setting. In addition, scenic vistas of streamside areas will remain intact as seen from the roadway. No mitigation measures are required, but to ensure that impacts to visual resources will be avoided and minimized, the project will implement measures

recommended as context sensitive solutions by the project's Visual Impact Assessment in accordance with Federal Highway Administration guidance.

Avoidance, Minimization, and/or Mitigation Measures

The following context sensitive measures will be implemented to avoid and minimize project impacts to visual resources and ensure that the project will be consistent with local scenic values along State Route 9.

- **Construction Access Roads**—Following construction, the contractor will regrade and recontour, as necessary, any construction access roads, staging areas, and other temporary uses created for the project to match the surrounding natural topography along State Route 9 in order to avoid unnatural-appearing remnant landforms.
- **Concrete Bridge Rails and Barriers**—Concrete bridge rails and barriers will be aesthetically treated to visually recede and appear more consistent with the natural, wooded character of the setting. The aesthetic treatment will be developed and approved by California Department of Transportation Structure Design in conjunction with District 5 Landscape Architecture Branch.
- **Bicycle and Pedestrian Rails**—Metal bicycle and/or pedestrian rails associated with the concrete bridge rails will be darkened or stained to minimize contrast and noticeability. The color will be developed and approved by California Department of Transportation Structure Design in conjunction with California Department of Transportation District 5 Landscape Architecture Branch.
- **Metal Roadside Elements**—All metal roadside elements like guardrails, transitions, end treatments, and cable safety railings will be stained or darkened to be visually compatible with the rural setting. The color will be determined and approved by California Department of Transportation District 5 Landscape Architecture Branch.
- **Landscape Vegetation**—Replacement vegetation plantings will include aesthetic considerations as well as the inherent biological goals. Revegetation will include native trees and plants as determined by the California Department of Transportation District 5 Biology and Landscape Architect Branches. Revegetation will occur at the maximum extent horticulturally viable. Planting will be maintained until established.

2.1.3 Cultural Resources

Regulatory Setting

The term "cultural resources," as used in this document, refers to the "built environment" (for example: structures, bridges, railroads, water conveyance systems), 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, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and Caltrans went into effect for Caltrans projects, both state and local, with Federal Highway Administration involvement. The Programmatic Agreement implements the Advisory Council on Historic Preservation's regulations called out in 36 Code of Federal Regulations 800, streamlines the Section 106 process, and delegates certain responsibilities to Caltrans. The Federal Highway Administration's responsibilities under the Programmatic Agreement have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 United States Code 327).

The California Environmental Quality Act requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California Public Resources Code, Section 5024.1 established the California Register of Historical Resources and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the California Register of Historical Resources and, therefore, a historical resource. Historical resources are defined in Public Resources Code, Section 5020.1(j). In 2014, Assembly Bill 52 added the term "tribal cultural resources" to the California Environmental Quality Act, and Assembly Bill 52 is commonly referenced instead of the California Environmental Quality Act when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in Public Resources Code, Section 21074(a), a tribal cultural resource is a California Register of Historical Resources 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 Public Resources Code, Section 21083.2.

Public Resources Code, Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the National Register of Historic Places listing criteria. It further requires Caltrans to inventory state-

owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register of Historic Places or are registered or eligible for registration as California Historical Landmarks. Procedures for compliance with Public Resources Code, Section 5024 are outlined in a Memorandum of Understanding between Caltrans and State Historic Preservation Officer, effective January 1, 2015. For most Federal-aid projects on the State Highway System, compliance with the Section 106 Programmatic Agreement will satisfy the requirements of Public Resources Code, Section 5024.

Affected Environment

A Historic Property Survey Report for the project was prepared in June 2019. The Area of Potential Effect for the proposed project includes the entire project footprint, including the current state right-of-way and adjacent areas, areas of ground disturbance, and areas of potential staging. As part of the report, Native American consultation, a records search, and an archeology survey were conducted.

Native American Consultation

As part of the preparation of the Historic Property Survey Report, the Native American Heritage Commission as well as Native American tribes, groups, and individuals were consulted. On June 5, 2019, the Caltrans-designated Native American coordinator for the project contacted the California Native American Heritage Commission to determine whether any recorded sites in the commission's Sacred Lands File occur in or near the project site. On June 7, 2019, the Native American Heritage Commission stated that a search of its Sacred Lands File did not indicate the presence of Native American cultural resources in the project's Area of Potential Effect.

Section 106 and Assembly Bill 52 consultation with Native American tribes, groups, and individuals was conducted. On June 7, 2019, the Caltrans-designated Native American coordinator for the project sent out introduction letters to begin formal consultation. As documented in the Historic Property Survey Report, no responses were received.

Records Search

In addition to Native American consultation, a records search was carried out in July 2019. The search included a review of all cultural resource records and reports for areas within 0.5-mile radius of the Area of Potential Effect. The primary reference materials included U.S. Geological Survey 7.5-minute maps, site records, report files, and the directory of properties in the historical properties data files.

Archaeology Survey

A systematic surface survey was conducted on April 24, 2019 as documented in the Historic Property Survey Report. The survey covered the proposed work areas of both the San Lorenzo River and Kings Creek bridges. It provided no evidence of prehistoric or early historic-period resources, and records indicate that no resources are in or near the project area.

Archaeological Resources Findings

A review of aerial imagery, inhouse records at the District 5 Caltrans Cultural Library, and a record search of the Native American Heritage Commissions Sacred Land Files yielded no evidence of prehistoric or early historic-period resources. The right-of-way within the project area has been previously surveyed with negative results. Records indicate no resources are in or near the Study Area. While the project does not have potential to indirectly affect any known cultural resources it does not dismiss the potential to uncover buried cultural deposits during construction phases.

Built Environment Findings

Within the Area of Potential Effect, the records search identified the San Lorenzo Bridges and Kings Creek Bridge as the sole built-environment resources.

The San Lorenzo River Bridge (Number 36-0052) is a single-span steel stringer bridge with reinforced concrete deck that was constructed in 1937 on top of older reinforced concrete abutments and wingwalls, which were part of the previous bridge constructed at an unknown date. The bridge is an unremarkable example of a common type of bridge. It was determined to be a Category 5 bridge in the Caltrans Historic Bridge Inventory and is not eligible for listing in the National Register of Historic Places or the California Register of Historic Resources.

The Kings Creek Bridge (Number 36-0054) is a two-span reinforced concrete T-girder bridge with reinforced concrete deck and column piers. The bridge was constructed in 1927, and concrete sack slope protection was placed in 1954. This bridge is also an unremarkable example of a common bridge type. It was determined to be a Category 5 bridge in the Caltrans Historic Bridge Inventory and is not eligible for listing in the National Register of Historic Places or the California Register of Historic Resources.

Review of aerial imagery, project design, historical mapping, and a field visit to both bridge locations confirmed that both project locations are screened from view of adjacent built environment resources due to heavy vegetation; therefore, the project does not have potential to indirectly affect adjacent built-environment resources. While the project includes work outside of the existing right-of-way for staging and access to the waterways, no permanent right-of-way acquisition is required, no structures outside the right-of-way will be

affected, and new construction will be within the ***state and County road** rights-of-way.

Environmental Consequences

***According the June 2019 Historic Property Survey Report, Caltrans, pursuant to Section 106 Programmatic Agreements has determined a Finding of No Historic Properties Affected is appropriate for this undertaking because there are no historic properties within the Area of Potential Effects.** However, previously undiscovered cultural resources could be uncovered during construction activities. If cultural materials are discovered during construction, all earthmoving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, California Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the county coroner shall be contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission, which, pursuant to Public Resources Code Section 5097.98, will then notify the most likely descendent. At that time, the person who discovered the remains will contact Caltrans District 5, which will work with the most likely descendent on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code 5097.98 are to be followed, as applicable.

Avoidance, Minimization, and/or Mitigation Measures

Since it is unlikely that designated cultural resources or tribal cultural resources will be adversely affected, no measures are required.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

Regulatory Setting

Executive Order 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 Federal Highway Administration requirements for compliance are outlined in 23 Code of Federal Regulations 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."

Affected Environment

The evaluation presented in this section is based on information provided by the 2016 Preliminary Hydraulic Report for the Advance Planning Study and the 2019 Project Approval and Environmental Document Hydraulic Recommendations memo prepared for the proposed project.

San Lorenzo River Bridge

As shown in Figure 2.1, the San Lorenzo River Bridge is in the one-percent annual chance Federal Emergency Management Agency (known as FEMA) special flood hazard area designated as a zone AE, where the base flood elevations have been determined. This area is also designated as a regulatory floodway where any increase in water surface elevation is restricted to a designated height. The San Lorenzo River drains a watershed of 51 square miles at the bridge site. According to the Federal Emergency Management agency report dated May 16, 2012, the 100-year discharge is 14,000 cubic feet per second. The bridge is the low point of the highway at this location.

Kings Creek Bridge

The Kings Creek Bridge is in the Federal Emergency Management Agency zone A, designated one-percent annual chance floodplain where no base flood elevations were determined, as shown on Figure 2.2. Kings Creek drains a watershed of eight square miles at the bridge site. The U.S. Geological Service Stream Stats program was used to calculate a 100-year discharge of 2,710 cubic feet per second. The existing Kings Creek Bridge has drainage swales and inlets on the north end on both northbound and southbound sides. This bridge has been classified as scour critical and is subject to severe erosion at the abutment and pier foundations.

Environmental Consequences

This project will replace both bridges with single-span bridges. ***Because the existing abutments at both bridges were constructed by casting materials directly into the exposed bedrock within the stream channel, the abutments will be partially removed in an effort to minimize removal of bedrock and alteration of the stream channel.** This will result in a reduction in the blocked cross-sectional area and will not impede or redirect flood flows. The project will also include recommendations made by the 2019 Project Approval and

Environmental Document Hydraulic Recommendations memo for both proposed bridges.

Figure 2.1 San Lorenzo River Bridge FEMA Flood Hazard Zone Map

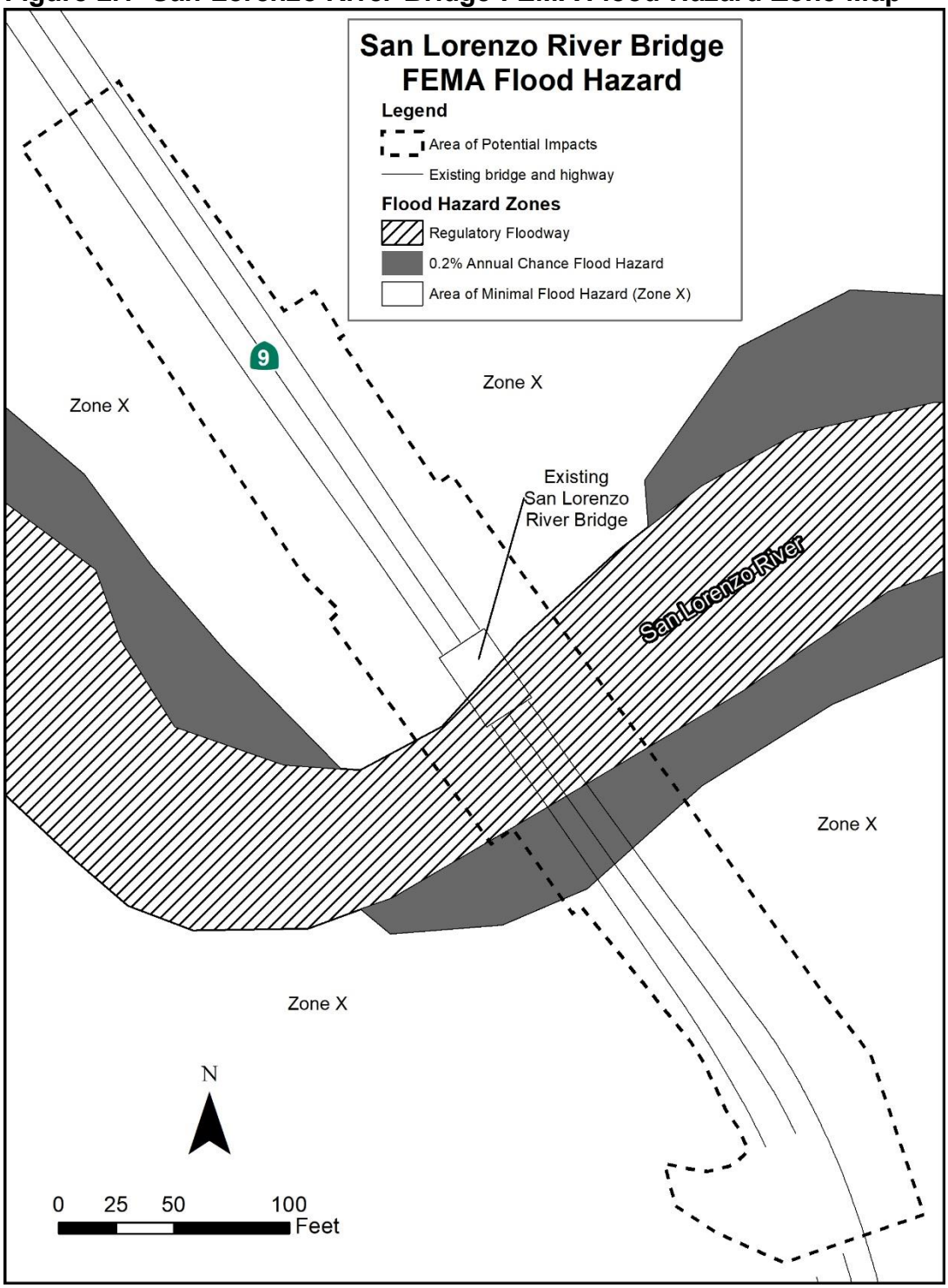
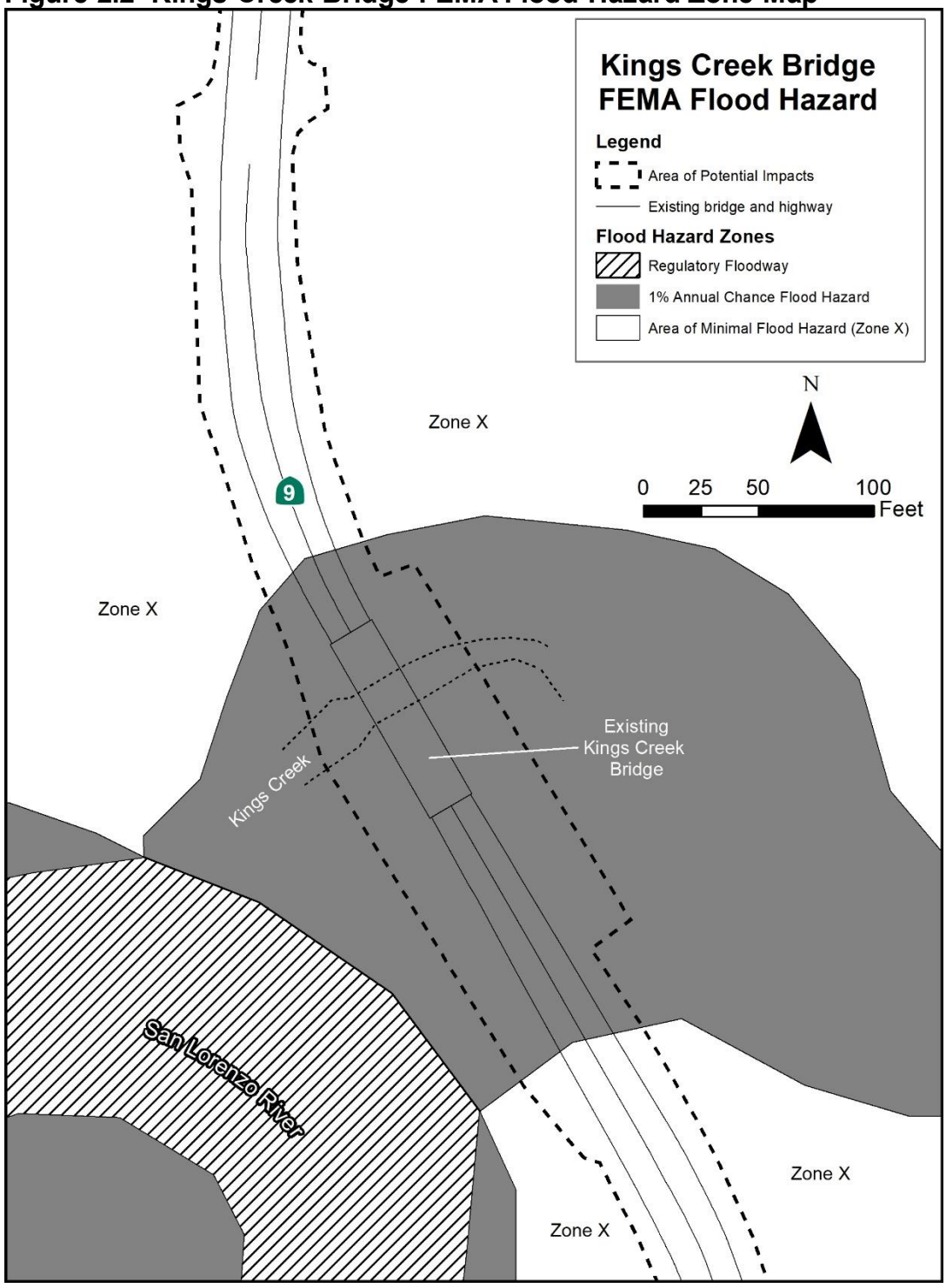


Figure 2.2 Kings Creek Bridge FEMA Flood Hazard Zone Map



San Lorenzo River Bridge

***Abutments and side support columns at the San Lorenzo River Bridge will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. Portions of**

the four existing side support columns and two abutments supporting the bridge will be removed during the period of seasonally low water and rain levels between June 1 and October 31. ***Future design plans are anticipated to provide greater detail on existing abutment removal. At this time, new abutments on either side will be constructed. New foundations for abutments will either be supported on spread footings or Cast-In-Drilled-Hole concrete piles, depending on weight loads and seismic demands.**

The new bridge will include longitudinal slope to allow water to flow to either side since the bridge is the low point of the highway at this location. The minimal longitudinal slope will be at 0.3 percent to allow for an acceptable spread of water across the bridge, or if a longitudinal slope cannot be provided then scuppers will be placed immediately before and after the bridge on both lanes.

Kings Creek Bridge

***At the Kings Creek Bridge, a portion of existing sacked concrete (0.049 acre), located approximately 10 feet above the Ordinary High Water Mark, along the existing northern abutment, will be replaced with rock slope protection. Abutments will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade.** The existing pier located below the Ordinary High Water Mark will be removed to approximately 3 feet below original grade. The two existing pier columns and portions of the abutments supporting the bridge will be removed during the period of seasonally low water and rain levels between June 1 and October 31. At this time, new abutments on either side will be constructed. ***New foundations for abutments will either be supported on spread footings or Cast-In-Drilled-Hole concrete piles, depending on weight loads and seismic demands.**

The new bridge will retain the existing drainage swales as inlets or replace them with overside drains with 24-inch downdrain pipes. Overside drains will be placed at the south end of the bridge on both sides.

Flood control will not be affected by project demolition or construction. New and replaced stormwater drainage systems will be adequately sized to address changes in topography resulting from changes in the bridge profile and associated project features. Therefore, implementation of the proposed project is not expected to expose people or structures to a significant risk of flooding or inundation.

There will be no reduction in elevation or bridge height for either bridge. The reduction in the blocked cross-sectional area within the San Lorenzo River and Kings Creek results in a slight decrease in water surface elevation compared with existing conditions. The project will not result in adverse effects that will substantially alter the existing drainage pattern of the sites or area, including through the alteration of the course of a stream or river, or

through the addition of impervious surfaces. The project will not 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. ***Based on this evaluation and the 2016 Preliminary Hydraulic Report for this project, Caltrans has determined that the two bridge replacements will not result in a significant encroachment in the San Lorenzo River and Kings Creek 100-year floodplains.**

Avoidance, Minimization, and/or Mitigation Measures

As noted in the Environmental Consequences discussion, there will be no potential for adverse effects related to hydrology and floodplains. Therefore, no measures are proposed.

2.2.2 Water Quality and Storm Water Runoff

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 discernable, confined, and discrete conveyance (known as a point source), such as a pipes, ditches, and other constructed drainage systems, unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System permit. This act and its amendments are known today as the Clean Water Act. Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the National Pollutant Discharge Elimination System permit scheme. The following are important Clean Water Act sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request.
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the United States. Regional Water Quality Control Boards 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.
- 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 U.S. Army Corps of Engineers.

The goal of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

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

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the U.S. Army Corps of Engineers Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the U.S. Army Corps of Engineers decision to approve is based on compliance with the U.S. Environmental Protection Agency's Section 404 (b)(1) Guidelines (40 Code of Federal Regulations Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines were developed by the U.S. Environmental Protection Agency in conjunction with the U.S. Army Corps of Engineers and allow the discharge of dredged or fill material into the waters of the United States only if there is no practicable alternative which would have less adverse effects. The Section 404(b)(1) Guidelines state that the U.S. Army Corps of Engineers may not issue a permit if there is a least environmentally damaging practicable alternative to the proposed discharge that would have lesser effects on waters of the United States and not have any other significant adverse environmental consequences. According to the Section 404(b)(1) Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Section 404(b)(1) 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 United States. In addition, every permit from the U.S. Army Corps of Engineers, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 Code of Federal Regulations 320.4. A discussion of the least environmentally damaging practicable alternative determination, if any, for the document is included in the Wetlands and Other Waters section.

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 Clean Water Act and regulates discharges to waters of the state. Waters of the state include more than just waters of the United States, like groundwater and surface waters which are not considered waters of the United States. Additionally, it prohibits discharges of "waste" as

defined, and this definition is broader than the Clean Water Act definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the Clean Water Act.

The State Water Resources Control Board and Regional Water Quality Control Boards are responsible for establishing the water quality standards (objectives and beneficial uses) required by the Clean Water Act and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable Regional Water Quality Control Board's Basin Plan. In California, Regional Water Quality Control Boards designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect those uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the State Water Resources Control Board identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with Clean Water Act 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 (National Pollutant Discharge Elimination System or Waste Discharge Requirements), the Clean Water Act requires the establishment of Total Maximum Daily Loads. Total Maximum Daily Loads specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The State Water Resources Control Board administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, Total Maximum Daily Loads, and National Pollutant Discharge Elimination System permits. Regional Water Quality Control Boards are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System Program

Municipal Separate Storm Sewer Systems

Section 402(p) of the Clean Water Act requires the issuance of National Pollutant Discharge Elimination System permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems. A Municipal Separate Storm Sewer Systems is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, channels, and storm drains) owned or

operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The State Water Resources Control Board has identified Caltrans as an owner/operator of a Municipal Separate Storm Sewer Systems under federal regulations. Caltrans Municipal Separate Storm Sewer Systems permits cover all Caltrans rights-of-way, properties, facilities, and activities in the state. The State Water Resources Control Board or the Regional Water Quality Control Board issues National Pollutant Discharge Elimination System permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans Municipal Separate Storm Sewer Systems Permit, Order Number 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order Number 2014-0006-EXEC (effective January 17, 2014), Order Number 2014-0077-DWQ (effective May 20, 2014) and Order Number 2015-0036-EXEC (conformed and effective April 7, 2015) 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) Best Management Practices, to the maximum extent practicable, and other measures as the State Water Resources Control Board determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The Statewide Storm Water Management Plan 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 Statewide Storm Water Management Plan 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 Best Management Practices. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest Statewide Storm Water Management Plan to address storm water runoff.

Construction General Permit

Construction General Permit, Order Number 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order

Number 2010-0014-DWQ (effective February 14, 2011) and Order Number 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area 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 result 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 this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the Regional Water Quality Control Board. 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 erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan. In accordance with the Caltrans Storm Water Management Plan and Standard Specifications, a Water Pollution Control Program is necessary for projects with a Disturbed Soil Area of less than one acre.

Section 401 Permitting

Under Section 401 of the Clean Water Act, 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 will comply with state water quality standards. The most common federal permits triggering 401 Certification are Clean Water Act Section 404 permits issued by the U.S. Army Corps of Engineers. The 401 permit certifications are obtained from the appropriate Regional Water Quality Control Board, dependent on the project location, and are required before the U.S. Army Corps of Engineers issues a 404 permit.

In some cases, the Regional Water Quality Control Board may have specific concerns with discharges associated with a project. As a result, the Regional Water Quality Control Board may issue a set of requirements known as Waste Discharge Requirements 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. Waste Discharge Requirements can be

issued to address both permanent and temporary discharges of a project. The project region is regulated by the Central Coast Regional Water Quality Control Board and the Central Coast Basin Plan.

Affected Environment

The project's April 2018 Water Quality Document for Bridge Replacement and the preliminary Jurisdictional Delineation Report (November 2019) included with the December 2020 Natural Environment Study, along with publicly available reference sources, were used in preparation of this section. No field review was conducted for the proposed project, but existing records and a set of preliminary project plans were reviewed.

Regional Hydrology

The proposed project sites are in the San Lorenzo River Watershed, which is within the San Lorenzo-Soquel Hydrologic Unit. The San Lorenzo River Watershed has been identified on the Central Coast Regional Water Quality Control Board 303(d) list for Total Maximum Daily Loads Priority Schedule of impaired waters. Kings Creek is a tributary to the San Lorenzo River and follows the same guidelines for purposes of water quality. Under the U.S. Clean Water Act, Total Maximum Daily Loads is a regulatory plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

The San Lorenzo River is a 29.3-mile-long river whose headwaters originate in Castle Rock State Park in the Santa Cruz Mountains and flow south by southeast through the San Lorenzo Valley before passing through Santa Cruz and emptying into Monterey Bay and the Pacific Ocean. The San Lorenzo River Bridge project site is 13 miles upstream from the San Lorenzo River Lagoon and Monterey Bay.

Kings Creek is a 7-mile long creek that starts just outside Castle Rock State Park near State Route 35 at an elevation of 3,000 feet and flows south to joins the San Lorenzo River near State Route 9 north of the unincorporated community of Boulder Creek. During the rainy season, it is a major contributor to the water flow of the San Lorenzo River and is fed by rainfall and several springs. The creek generally flows all year-round, except in drought years during the very late summer and early fall before the rainy season. The Kings Creek Bridge project site is 15 miles upstream from the San Lorenzo River Lagoon and Monterey Bay.

Receiving Water Bodies

Kings Creek feeds into the San Lorenzo River which is the primary tributary of the San Lorenzo Watershed. The river carries water all year long with higher levels and increased flow during the rainy season. The San Lorenzo River Lagoon is a large estuary that drains the 140-square-mile watershed. The lagoon empties into Monterey Bay and the Pacific Ocean.

Impairments of Receiving Water Bodies

Many studies have been performed to monitor and characterize highway stormwater runoff throughout the state. Commonly found pollutants are total suspended solids, nitrate nitrogen, total Kjeldahl nitrogen (sum of organic nitrogen, ammonia, and ammonium), phosphorous, orthophosphate, copper, lead and zinc. Some sources of these pollutants are natural erosion, phosphorus from tree leaves, fossil fuel combustion, and brake pads and tires. In some cases, these stormwater pollutants can lead to impairment of the receiving water body or exacerbation of existing impairments.

Tsunami Zone

According to National Oceanic and Atmospheric Administration mapping the project site is not within a tsunami zone.

Municipal Supply

The San Lorenzo Valley Water District is the water utility provider for the project area. Established in 1941 the water district supplies water in the San Lorenzo Valley to the communities of Boulder Creek, Brookdale, Ben Lomond, Lompico, Zayante, Scotts Valley, Manana Woods and Felton. Beginning its journey from deep water wells or from one of the Surface Water Treatment Plants, the district's water supply travels through a network of water lines totaling more than 185 miles. Through this network of distribution lines, pump stations, and reservoirs the water district serves more than 7,900 connections. The district owns and operates an 8-inch water main along the State Route 9. The water main is suspended from the bridge decking.

Groundwater Hydrology

The project site is within the Santa Margarita Basin which draws from the Santa Margarita Aquifer. The Santa Margarita Aquifer is listed as a sole source aquifer according to the Environmental Protection Agency's Interactive Map of Sole Source Aquifers (Available at: https://www.epa.gov/dwssa/map-sole-source-aquifer-locations). The Environmental Protection Agency defines a sole source aquifer as one where:

- The aquifer supplies at least 50 percent of the drinking water for its service area, and
- There are no reasonably available alternative drinking water sources should the aquifer become contaminated.

During the dry season, 40 percent to 50 percent of the flow of the San Lorenzo River comes from the Santa Margarita Basin. Groundwater, like that from the Santa Margarita Basin, and surface water are closely connected. Throughout the San Lorenzo River and its tributaries, there are places where groundwater surfaces and supplies baseflow to the river (gaining) as well as places where the surface water infiltrates and goes underground (losing). Depleted groundwater levels can cause a historically gaining stream to cease

to receive groundwater, and possibly even become a losing stream. This can reduce the flow in the river, particularly in the dry months, which can in turn be a devastating blow to local salmonid species. It's critical that groundwater basins are monitored and managed. Groundwater levels in the Santa Margarita Basin have dropped approximately 200 feet from historical levels. Thanks to increased conservation efforts implemented by the water districts, groundwater levels stabilized in the mid-1990s. While they have remained fairly steady over the past 20 years, there has been no noticeable trend towards groundwater level recovery. Therefore, the basin is currently facing surface water depletion, reduction of storage, degraded water quality and lowering of groundwater levels.

Up until recently, water agencies worked fairly independently in managing water resources (though this region does have a history of collaboration). That changed in 2015 with the Sustainable Groundwater Management Act. The act requires that certain groundwater basins form a Groundwater Sustainability Agency to prepare a Groundwater Sustainability Plan bring that basin into sustainability by 2042. The Santa Margarita Groundwater Agency was formed as a result, uniting the County of Santa Cruz, Scotts Valley Water District, the San Lorenzo Valley Water District and other stakeholders in a Joint Powers Authority. The Santa Margarita Groundwater Agency is one of three groundwater management agencies formed in Santa Cruz County. The agency is in the process of drafting a Groundwater Sustainability Plan for the basin, which is expected to be ready for public review in July 2021 and submittal in January 2022.

Environmental Consequences

Temporary Impacts

During construction, the project has the potential for temporary water quality impacts due to grading and excavation activities and the removal of existing vegetation on the roadway portion of the project, which could increase erosion. Construction activities associated with the proposed project, including clearing and grubbing, will result in an estimated 0.47 acres (20,475 square feet) of total disturbed soil area. This estimate includes the total bridge construction area, structure excavation area, potential local road excavation areas, and potential contractor stockpiling and staging areas.

Surface Water

The substrate in both bridge sites is expected to be disturbed during the demolition and construction phases of the project. During bridge demolition, the existing driven concrete pile extensions will require physical removal, resulting in substrate disturbance within the live channel. Likewise, disturbance of the substrate will occur during installation of abutment foundations for the new bridges. If a cofferdam is constructed for the removal of pier foundations, the impact on water quality will be reduced. Abutment removal and installation may also contribute to substrate disturbance if

appropriate best management practices are not deployed to control sediment transport into the stream channel.

Although some turbidity and erosion of streambanks will occur during bridge removal and installation, degradation of water quality will be minimized through proper engineering controls. Oil, grease, and other pollutants, including metals and pesticides, are not expected to enter the creek channel when proper best management practices are applied to construction activities. Temperature and oxygen depletion due to litter are not expected to affect the waterways. Therefore, construction of the proposed project is not expected to violate any water quality standards or Waste Discharge Requirements or substantially degrade water quality.

Minor temporary changes are expected to occur in the live channel related to circulation, drainage patterns, and flow rates to the waterways as the old bridge piers are removed. Measures identified for in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, and tree and shrub replacement to minimize impacts to Central California Coast Coho Salmon Critical Habitat in Section 2.3.4 (Threatened and Endangered Species) will further minimize potential effects to surface water. Therefore, construction of the proposed project is not expected to substantially alter the existing drainage pattern of the area.

Groundwater

Land-based excavation work will be required for abutment construction for the new bridges, with some minor earthwork for abutment slopes and foundations. Dewatering may be needed if seasonally high groundwater is encountered. If any groundwater occurs, perforated manifolds will be installed in the ground, and water will be suctioned into a Baker tank or settling basin for treatment. The proposed improvements will not involve substantial excavation that will affect groundwater resources.

The avoidance and minimization measures identified for aesthetic/visual impacts require the planting of native shrubs along the face of any proposed retaining walls to reduce noticeability. Vegetation removed in temporary work areas will be fully replanted and established. These activities may require temporary irrigation to establish. Caltrans complies with water conservation requirements by Executive Orders issued during Governor Edmund J. Brown's term and maintains a goal of reducing water consumption by 50 percent compared to 2013 baseline usage. Caltrans often plants California native plant species and designs temporary irrigation systems to minimize water consumption. Trucks deliver recycled water to these temporary drip irrigation systems. Permanent irrigation systems are installed when a water purveyor is available with recycled water being prioritized for use. Systems over 500 square feet must comply with the Model Water Efficient Landscape Ordinance.

Permanent Impacts

Surface Water

The proposed project will increase the amount of combined impervious surface by 0.237 acre (10,324 square feet). The new impervious surface will result from where the pavement alignment will be widening into natural areas to support a road taper to the new, wider bridges. These areas at the San Lorenzo Bridge total 0.082 acre (3,570 square feet) and at Kings Creek Bridge total 0.155 acre (6,750 square feet). Compared with the overall watershed of the waterways, the slight increase in flow due to the proposed project will be negligible. Therefore, operation of the proposed project will not substantially alter the existing drainage pattern of the area.

Groundwater

As stated above, the proposed project will increase the total amount of impervious surface by 0.237 acre. This will decrease the amount of area available for infiltration. Although a change will occur, the impact will be negligible because of the small size of the added impervious surface compared with the size of the overall groundwater area as well as the highly variable nature of existing groundwater flow paths.

The project will include implementation of Caltrans Best Management Practices and Standard Specifications. The Caltrans Standard Specifications Section 7-1.01G (Water Pollution) requires the contractor to exercise every reasonable precaution to eliminate potential effects to water quality. A Water Pollution Control Plan will be prepared and implemented during construction to the satisfaction of the Resident Engineer.

The potential to effect water quality will be minimized through implementation of a list of preventative measures in Section 7 and Section 8 of the Caltrans Construction Site Best Management Practices Manual. Some of these precautionary measures are listed below and will be implemented during the demolition and reconstruction of the bridge.

Concrete curing is used in the construction of structures such as bridges, retaining walls, and pump houses. Concrete curing includes the use of both chemical and water methods. All concrete elements of a structure (like footings, columns, abutments, stems, soffit, and decking) are subject to curing requirements. Implementation of Caltrans Storm Water Best Management Practice NS-12 (Concrete Curing) will require the contractor to conduct the proper procedures to minimize any potential for chemical runoff during concrete curing.

Caltrans Storm Water Best Management Practice NS-13 (Material and Equipment Use Over Water) will require the contractor to implement procedures for the proper use, storage, and disposal of materials and equipment on temporary construction pads or similar locations to minimize or

eliminate the discharge of potential pollutants into storm drain inlets or receiving waters.

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high-pressure water blasting. Caltrans Storm Water Best Management Practice NS-14 (Concrete Finishing) will require the contractor to implement proper procedures to minimize the impact that concrete finishing methods may have on runoff.

Caltrans Storm Water Best Management Practice NS-15 (Structure Demolition/Removal Over Adjacent Water) requires procedures to protect water bodies from debris and wastes associated with structure demolition or removal over or adjacent to receiving waters.

Caltrans Storm Water Best Management Practice WM-4 (Spill Prevention and Control) will be implemented by the contractor to prevent and control spills in a manner that minimizes or prevents the discharge of spilled material to the drainage system or watercourses.

Solid waste management procedures and practices are implemented on all construction projects that generate solid wastes. Solid wastes include but are not limited to:

- Construction wastes including brick, mortar, timber, steel and metal scraps, sawdust, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials;
- Highway planting wastes, including vegetative material, plant containers, and packaging materials; and
- Litter, including food containers, beverage cans, coffee cups, paper bags, plastic wrappers, and smoking materials, including litter generated by the public.

Caltrans Storm Water Best Management Practice WM-5 (Solid Waste Management) will require solid waste management procedures and practices designed to minimize or eliminate the discharge of pollutants to the drainage system or to water bodies as a result of the creation, stockpiling, or removal of construction site wastes.

Caltrans Storm Water Best Management Practice WM-6 (Hazardous Waste Management) is implemented on construction projects that generate waste from the use of petroleum products, asphalt products, concrete curing compounds, pesticides, palliatives, acids, paints, stains, solvents, septic wastes, wood preservatives, roofing tar, or any materials deemed a hazardous waste in California, Title 22 Division 4.5, or listed in 40 Code of Federal Regulations Parts 110, 117, 261, or 302. It will require the contractor

to use procedures and practices to minimize or eliminate the discharge of pollutants from construction site hazardous waste to the storm drain systems or to watercourses.

Liquid waste management is applicable to construction projects that generate any of the following nonhazardous byproducts, residuals, or wastes:

- Drilling slurries and drilling fluids
- Grease-free and oil-free wastewater and rinse water
- Dredgings
- Other non-storm water liquid discharges not permitted by separate permits

Caltrans Storm Water Best Management Plan WM-10 (Liquid Waste Management) requires procedures and practices to prevent discharge of pollutants to the storm drain system or to receiving waters as a result of the creation, collection, and disposal of non-hazardous liquid wastes.

Measures identified for in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, and tree and shrub replacement to minimize impacts to Central California Coast Coho Salmon Critical Habitat in Section 2.3.4 (Threatened and Endangered Species) will further minimize potential effects to water quality and storm water runoff.

Avoidance, Minimization, and/or Mitigation Measures

As noted in the Environmental Consequences discussion, there will be no potential for adverse effects related to water quality and storm water runoff. Therefore, no mitigation is proposed.

2.2.3 Geology, Soils, Seismicity, and Topography

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 the California Environmental Quality Act.

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. Structures are designed using the Department's Seismic Design Criteria. The Seismic Design Criteria 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, please see the

California Department of Transportation's Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

Affected Environment

The evaluation presented in this section is based on information provided by the Structure Preliminary Geotechnical Reports for the San Lorenzo River Bridge and Kings Creek Bridge abutments and retaining walls conducted in June 2016 and November 2019. Historic records and visual inspections of the existing structures and geologic settings were used to identify potential geotechnical issues.

The proposed project is in the Santa Cruz Mountains in the Coast Ranges geomorphic province. The Coast Ranges geomorphic province is characterized by a landscape controlled by a regional-trending-northwest structure of faults and folds. The Santa Cruz Mountains are composed mostly of Cenozoic marine rocks, which are unconformably overlain crystalline basement rock composed of meta-sedimentary and granitic rock characteristic of the Salinian block. Locally, the site is composed of recently deposited alluvium overlying Oligocene and Eocene aged mudstone.

General Terrain and Topography of the Project Area

The terrain in the area consists of steep-sided mountains and steep drainages covered densely with mature trees and understory vegetation. Rock composition, formation, and structure controls the steepness of terrain. The State Route 9 corridor travels through the canyon walls of the San Lorenzo River drainage system, which cuts across numerous geologic units susceptible to varying rates of erosion. However, neither project site is within a designated landslide hazard area as depicted on the County of Santa Cruz Landslide Hazard Area (2009).

There are no unique geologic features in the project area, and views of the surrounding mountain peaks are generally obscured by vegetation. There is typically little to no precipitation during the summer months and moderate to heavy precipitation in the winter months (November through March). Average annual rainfall in the project area is 50 inches.

San Lorenzo River Bridge

The original single-span structure was constructed pre-1936. The original superstructure was rebuilt and left widened in 1937. The widened structure includes five spans and consists of the original abutments and spread footing extensions at the two northernmost side support columns, isolated spread footings at the two southernmost columns, and standard retaining walls at both abutments. The abutment and side support column foundations rest on sandstone.

Based on a review of regional geological maps of Santa Cruz County, the geology at the San Lorenzo Bridge consists of alluvial (Quaternary) overlying steeply sedimentary rock. The sedimentary rock is commonly called Butano Sandstone and described as medium-bedded to massive, yellow-gray arkosic sandstone with thin interbeds of olive-gray siltstone and thick interbeds of sandy pebble conglomerate in the lower part. A subsurface investigation was conducted in 1936 for the purpose of widening the original single-span structure indicated. Five test holes were drilled between the abutments. Material removed from these test holes typically contained sandy soils, roots, humus, and logs overlying sandstone in varying states of decomposition.

Scour refers to a localized loss of soil, often around a foundation element. The existing San Lorenzo River Bridge does not have any scour issues.

Based on a review of the 1936 Profile and Test Holes Sheet from the subsurface investigation, groundwater was not identified in the five auger holes. However, the underlying rock is much less permeable than the overlying soil, so perched groundwater may exist at this location. This potential condition may transmit perched water into excavations down to the bedrock during construction. The amount of groundwater that permeates the overlying soil and flows on top of the rock may vary considerably depending on the amount of precipitation and/or intensity of storm events. Ground water levels will be measured and recorded during the subsurface investigation conducted during the Plans, Specifications, and Estimates phase of the project.

Caltrans considers a site potentially corrosive to foundation elements if one or more of the following conditions are met for the representative soil and/or water samples taken at the site: pH of 5.5 or less, chloride content greater than 500 parts per million, or sulphate content greater than 1,500 parts per million. No corrosion information currently exists for the native soils and fill soils at the San Lorenzo Bridge project site.

The San Lorenzo River Bridge project site is potentially subject to strong ground motions from nearby earthquake sources during the design life of the project. According the Caltrans Acceleration Response Spectrum Online Tool (Version 2.3.7), the controlling fault for the site is the Zayante-Vergeles Upper Fault, located approximately 100 feet northeast of the site. This fault has a maximum moment magnitude of 6.8. The estimated average shear wave velocity for the upper 100 feet of rock and soil is 2,493 feet per second (760 meters per second). The Zayante-Vergeles Fault is not a zoned fault, and the fault of the rupture plane lies within 1,000 feet of the San Lorenzo River Bridge. There is a lack of fault data providing conclusive evidence that this section of the Zayante-Vergeles Fault is active. A fault rupture evaluation at this site will be necessary to confirm. Additional faults with potential to produce strong ground shaking at the project site are presented in Table 2.1.

Table 2.1 San Lorenzo River Bridge Seismic Conditions

Fault Name	Fault Type	Moment magnitude of maximum credible earthquake	Distance from fault to project site (miles)	Peak ground acceleration as a percentage of gravity
Zayante-Vergeles (Upper)	Strike-slip	7.0	0.02 or 100 feet	0.682
San Andreas (Santa Cruz Mountains)	Strike-slip	8.0	7.03	0.309
Zayante-Vergeles (Lower)	Strike-slip	7.0	5.54	0.374

Kings Creek Bridge

The existing Kings Creek Bridge, built in 1927, is a two-span, reinforced concrete tee-girder bridge supported on a single two-column pier and reinforced concrete spill-through abutments. The abutments and pier are supported on spread footings. The as-built Plan and Elevation sheet indicates that the site is underlain by sandy loam overlying shale (mudstone). The pier and abutments are supported on spread foundations excavated through the sandy loam and founded on the underlying mudstone.

Field observations and review of the as-built plans indicate that sandy loam overlying massive olive-gray mudstone is beneath the Kings Creek Bridge project site. According to the 1927 Plan and Elevation sheet, the contact of the two units is approximately 500 feet below the bridge's foundations.

Scour refers to a localized loss of soil, often around a foundation element. The existing Kings Creek Bridge is classified as a scour critical bridge, which is a bridge that has foundations determined to be unstable for assessed or calculated scour conditions. The 1956 bridge inspection report noted the embankment at the northern abutment was partially washed out. In response, a concrete sack slope was constructed. Since that time, the concrete sack slope at this abutment has remained stable.

The 1977 bridge inspection report was the first observation of exposure and undermining of foundations at the pier. Attempts to mitigate scour at the pier were performed in 1977 and 1988 by backfilling and placing concrete sack scour protection, both were ineffectual. A 2004 hydraulic report noted that the rock previously thought to be scour resistant was scouring. The bridge was classified as scour critical after the 2004 bridge inspection report. A 2005 Plan of Action for scour at Kings Creek Bridge proposed: removing all loose and decomposed bedrock material from beneath undermined portions of the Pier 2 footings, grout the resulting voids between bottom of footings and sound bedrock, and then surround the pier with a one-meter-thick layer of Half-Ton Rock Slope Protection rock. In 2014, Caltrans Bridge Crew personnel placed

concrete about both foundations at the pier. Countermeasures proposed in the 2005 Plan of Action have not yet been performed. During the June 2016 field visit, Caltrans staff observed the up-station side of the pier footings were not founded on sound bedrock and gaps had formed between the bottom of footing and ground surface.

No as-built Log of Test Borings or groundwater information is available for this structure. However, between the northern abutment and the pier the groundwater elevation can reasonably be assumed to be near the water surface elevation of the creek. Because the underlying rock is much less permeable than the overlying soil, perched groundwater conditions may also exist at this location. Groundwater elevations, if present, will be measured and recorded during the subsurface investigation conducted during the Plans, Specifications, and Estimates phase of the project.

Caltrans considers a site potentially corrosive to foundation elements if one or more of the following conditions are met for the representative soil and/or water samples taken at the site: pH of 5.5 or less, chloride content greater than 500 parts per million, or sulphate content greater than 1,500 parts per million. No information currently exists regarding corrosion. Samples will be collected during the subsurface investigation and tested for corrosion potential and the results provided in the Foundation Report.

Based on the Caltrans Seismic Design Procedures, the following active and potentially active faults are located within near the Kings Creek Bridge project site. The Caltrans Acceleration Response Spectrum Online Tool (Version 2.3.07) was used to develop preliminary acceleration response spectrum curves for deterministic and probabilistic seismic prediction models. An estimated average shear velocity of 2,130 feet per second (650 meters per second) for the upper 100 feet was used to develop the preliminary curves. A basin factor of 1.0 was assumed for this location and the Caltrans Acceleration Response Spectrum Online Tool applied a near fault factor to the data. Additional faults with potential to produce strong ground shaking at the project site are presented in Table 2.2.

Table 2.2 Kings Creek Bridge Seismic Conditions

Fault Name	Fault Type	Moment magnitude of maximum credible earthquake	Distance from fault to project site (miles)	Peak ground acceleration as a percentage of gravity
Zayante-Vergeles (Upper)	Strike-slip	7.0	1.34	0.489
San Andreas (Santa Cruz Mountains)	Strike-slip	8.0	6.32	0.327
San Andreas (Peninsula)	Strike-slip	8.0	8.14	0.284

Environmental Consequences

A risk-free seismic environment does not exist anywhere in California. Generally, shaking is less severe on rock than on alluvium or fill, but ridge effects and other local phenomena may override this generalization. Assessment of the project sites were conducted based on the U.S. Geological Survey/California Geological Survey Probabilistic Seismic Hazards Assessment Model (revised April 2003). For any given site, the model calculates the ground motion effect (known as peak acceleration) at the site for all the earthquake locations and magnitudes believed possible in the vicinity of the site. Each of these magnitude-location pairs is believed to happen at some average probability per year. Small ground motions are relatively likely, and large ground motions are very unlikely. Beginning with the largest ground motions and proceeding to smaller, the model adds up probabilities until it arrives at a total probability corresponding to a given probability in a defined time period. This probability is evaluated based upon the percentage of the acceleration of gravity for the nearest and most influencing seismic hazard contributor, which for both bridge sites is the Zayante-Vergeles (Upper) fault.

The San Lorenzo River Bridge site has a probabilistic factor of 0.555 percent of exceeding a peak ground acceleration of 0.682 g over a 975-year return period (where “g” is expressed as a percentage of the acceleration of gravity). The Kings Creek Bridge site has a probabilistic factor of 0.57 percent of exceeding a peak ground acceleration of 0.489 g over a 975-year return period. According to the U.S. Geological Survey, peak ground accelerations measured as a percent of gravity ranging from 0.34 to 0.65 usually produce severe ground shaking and typically result in moderate to heavy damage to structures if shaking continues for a long period of time. The subsurface conditions under both bridge site is generally described as loose alluvial sandstone deposits and forest debris over harder bedrock surfaces, therefore, although minimal, the potential for strong shaking exists at both bridge sites.

Since the nearby Zayante-Vergeles Fault is an “unzoned” fault and the top of the fault rupture plain lies within 1,000 feet of the San Lorenzo River Bridge site, a fault rupture evaluation will be conducted at this site during the Plans, Specifications, and Estimates phase of the project. Specific recommendations from this evaluation will be included in the design of the project to minimize potential effects from fault rupture.

Liquefaction is a process by which water-saturated sediment temporarily loses strength and acts as a fluid, like when you wiggle your toes in the wet sand near the water at the beach. This effect can be caused by earthquake shaking. Potential for earthquake induced liquefaction exists whenever relatively loose, sandy soils are mixed with high groundwater level and/or have potential for long duration, high seismic shaking. When liquefaction occurs, the site can experience damage induced by permanent ground movements resulting in differential settlement and flotation of structures and

utilities. If liquefaction occurs, then the potential for lateral spreading of near-surface soils may also exist.

The as-built plans for both bridges indicate that sandy soils were encountered below the groundwater table, and these soils may be susceptible to liquefaction. Typical with bridge construction projects, site-specific geotechnical and geological investigations that focus on the potential liquefaction hazard will be performed as part of the projects Plans, Specifications, and Estimates phase. As necessary, design and construction of the project components will include foundation treatments, such as removal and re-compaction or deep foundations, to reduce impacts from liquefaction.

According to the preliminary geotechnical reports prepared for the project, site soils are not considered expansive since they consist mostly of degraded sandstone and bedrock and mudstone and sandy loam overlaid by vegetative debris. The risk of encountering expansive soil at the project sites is minimal.

***Since the existing abutments at both bridges were constructed by casting materials directly into the exposed bedrock within the stream channel, the abutments will be partially removed in an effort to minimize removal of bedrock and alteration of the stream channel. Abutments and side support columns at the San Lorenzo River Bridge will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. Future design plans are anticipated to provide greater detail on existing abutment removal. There are no soil erosion concerns at the San Lorenzo River Bridge site since there is no history of soil erosion and the bridge is not considered scour critical. One abutment foundation for the new San Lorenzo River Bridge will be a shallow footing since the rock there is competent, shallow, and not at risk from scour. The other abutment will be a deep pile foundation based on the lower rock strength and deeper depth to rock ratio, as opposed to the other side.

The Kings Creek Bridge site is scour critical and will be designed with that as a concern.** Temporary slopes and/or shoring may be required for spread footings to reach the elevation of rock required for scour considerations at the Kings Creek Bridge site. ***At the Kings Creek Bridge, a portion of existing sacked concrete (0.049 acre), located approximately 10 feet above the Ordinary High Water Mark, along the existing northern abutment, will be replaced with rock slope protection. Abutments will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. The existing pier located below the Ordinary High Water Mark will be removed to approximately 3 feet below original grade. The removal of the existing bridge abutments will improve potential scour and flow concerns.** The contractor will provide a design for temporary shoring, and the design will be approved by Caltrans. The risk of landslides in the project area is minimal.

Excavations and grading activities will disturb and expose soils at both bridge site locations during project construction; therefore, a potential for soil erosion exists. Stormwater pollution control requirements are intended to be implemented on a year-round basis at an appropriate level. The requirements must be implemented in a proactive manner during all seasons while construction is ongoing. Appropriate water pollution control includes the implementation of an effective combination of both soil stabilization and sediment controls, implementation of wind erosion, tracking controls, non-stormwater and waste management, and material pollution Best Management Practices. As identified in Section 2.2.2 (Water Quality and Storm Water Runoff) stormwater pollution control requirements will be included during the Plans, Specifications, and Estimates phase of the project and will minimize any effects to soils from erosion. Also, biological measures for erosion control, site restoration, and tree and shrub replacement identified in Section 2.3.4 (Threatened and Endangered Species) will further minimize soil erosion.

Pre-1933 structures may be considered at a higher level of risk due to the age and construction techniques used. As the new bridges will replace existing pre-1933-built bridges and will be designed with updated seismic design requirements, it is expected that the San Lorenzo River Bridge and Kings Creek Bridge Replacement project will generally be more stable during an earthquake event. Furthermore, the project components will be designed and constructed to the seismic design requirements for ground shaking specified in the project design documents. The new bridge design will also minimize soil erosion by removing structures from the active channels and provide scour protection. Proper design and construction of the project components will reduce impacts from ground shaking, seismicity, and soil hazards.

Avoidance, Minimization, and/or Mitigation Measures

As noted in the Environmental Consequences discussion, there will be no potential for adverse effects related to seismicity, groundwater and liquefaction, or soils. Therefore, no measures are proposed.

2.3 Biological Environment

2.3.1 Natural Communities

This section of the document discusses natural communities of concern. 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 and thereby lessening its biological value.

Habitat areas that are designated as critical habitat under the federal Endangered Species Act are discussed in Sections 2.3.4 (Threatened and Endangered Species). Wetlands and other waters are discussed in Section 2.3.2 (Wetlands and Other Waters).

Affected Environment

The Natural Environment Study prepared in December 2020 was the primary source used in preparation of this section. The biological study area is defined as the area that may be directly, indirectly, temporarily, or permanently affected by construction and construction-related activities and a buffer to encompass all indirect effects to surrounding natural areas. For this project, the biological study area includes all potential permanent and temporary direct impacts and a 200-foot buffer to account for potential temporary and permanent indirect impacts to plants and wildlife that may be caused by the construction action. Direct impacts include the removal of habitat and vegetation for the removal of existing bridges and piers, access roads, utility relocations, and construction work or staging areas. Indirect impacts include construction noises, dust produced by ground disturbance, visual impacts of large equipment and bridge demolition, and ground vibrations caused by the large equipment and demolition that may disturb wildlife.

In general, the biological study areas for both bridges contain both Caltrans state right-of-way, ***County right-of-way,** and private property. On a landscape scale, they are surrounded by privately-owned houses and parcels in the redwood forest between the city of Santa Cruz to the south, Castle Rock State Park to the northeast, and Big Basin State Park to the northwest. The biological study areas occur in a developed rural residential setting in the Santa Cruz mountains, near the town of Boulder Creek and the Redwood Grove neighborhood. State Route 9 is typically used for commuting between large cities such as San Jose and Santa Cruz, and the smaller communities along the route, such as Boulder Creek and Redwood Grove. In the biological study areas, State Route 9 is a curvy two-lane conventional highway with narrow lanes and shoulders. The highway shoulder often has pullouts for bus stops, private driveways, and stopped vehicles. There are large vehicle pullouts for bus stops and private driveways immediately to the north and south of the San Lorenzo River location. Both project sites are surrounded by rural residential housing communities.

Vegetation Communities

Provided below is a description of the natural communities identified in the biological study areas.

California Coastal Redwood Forest

The surrounding residential lands, upper banks, and roadsides in the biological study areas are described as California coastal redwood forest. As is typical, the California coastal redwood forest in the biological study area is

characterized by a dominance of coast redwoods (*Sequoia sempervirens*), and a lower tier of trees such as big leaf maple (*Acer macrophyllum*), white alder (*Alnus rhombifolia*), California bay laurel (*Umbellularia californica*) and tanoak (*Notholithocarpus densiflorus*). Shrubs are absent, but an herbaceous layer is abundant. The understory is dominated by redwood sorrel (*Oxalis oregana*), bedstraw (*Gallium aparine*), and several species of fern.

No special status plant species were observed in this community during field surveys. No special status animal species were observed in the biological study areas during field surveys, but this community has the potential to provide habitat for several species, including California giant salamander (*Dicampton ensatus)*, Santa Cruz black salamander (*Anneides niger*), foothill yellow-legged frog (*Rana boylii*), American peregrine falcon (*Falco peregrinus anatum*), osprey (*Pandion haliaetus*), marbled murrelet (*Brachyrampuhus marmoratus*), and other nesting migratory bird species. Potential impacts to special status animal species are further discussed in Section 2.3.3 (Animal Species) and Section 2.3.4 (Threatened and Endangered Species) of this document.

Riparian

Riparian vegetation exists along the channels of the San Lorenzo River and Kings Creek. The riparian zone generally consists of the streambank and shrubs and trees that overhang the waterways. No special status animal species were observed in the biological study areas during field surveys, but this community has the potential to provide habitat for several special status species, including California giant salamander, Santa Cruz black salamander, foothill yellow-legged frog (*Rana boylii*), American peregrine falcon, osprey, and other nesting migratory bird species. Potential impacts to special status animal species are further discussed in Section 2.3.3 (Animal Species) and Section 2.3.4 (Threatened and Endangered Species).

Riparian vegetation immediately along the channel within the biological study area for the San Lorenzo River Bridge is sparse to lacking due to the bedrock banks. Tree species within this riparian zone include coast redwood, red alder (*Alnus rubra*), sycamore (*Plantanus racemosa*), and tanoak. No special-status plant species were observed in this community during field surveys.

The riparian area in the Kings Creek Bridge biological study area is limited to the south bank, including the bench area upstream of the bridge and the vegetated bank downstream from the bridge. Vegetation within the bench is predominated by non-native, invasive Himalayan blackberry (*Rubus armeniacus*) and English ivy (*Hedera helix*) upstream from the bridge. On the downstream side of the bridge, on the left bank, the bench is vegetated with native vegetation including red alder and thimbleberry (*Rubus parviflorus*). The bank is unvegetated under the bridge. The entire north bank within the biological study area is developed with concrete sack slope protection.

Environmental Consequences

Permanent Impacts

Permanent impacts will be limited to areas where the State Route 9 alignment will be widened into unpaved areas to support a road taper from the existing alignment to the newer, wider bridges. These areas will total 0.082 acre (3,570 square feet) at the San Lorenzo River and 0.155 acre (6,750 square feet) at Kings Creek. This will include unpaved road shoulders but will also impact California coastal redwood forest areas. These impacts will be limited to the vegetated understory, and trees removed from the riparian zones will be replaced after construction.

Temporary (Construction) Impacts

Temporary impacts include equipment staging areas, access roads, and work areas that are needed to construct the new bridge and remove the existing bridge. These impacts will include tree and vegetation removal, grading, compaction by construction equipment, and foot traffic related to construction and utility work. All temporary work areas will be returned to the original grade and contour and revegetated after construction.

San Lorenzo River Bridge

Temporary impacts will total 0.277 acre (12,066 square feet) and will include areas in the San Lorenzo River that will be fully diverted, access roads through riparian zones to reach the river, and ruderal roadside vegetation that will be required for equipment storage. Impacts to the associated riparian zone along the San Lorenzo River will total 0.022 acre (960 square feet) and will be temporary in nature.

Kings Creek Bridge

Temporary impacts will total 0.192 acre (8,364 square feet) and will include areas in Kings Creek that will be fully diverted, access roads through riparian zones to reach the river, and ruderal roadside vegetation that will be required for equipment storage.

Impacts to the associated riparian zone along the Kings Creek will total 0.015 acre (650 square feet) and will be temporary in nature. In the Kings Creek, there are currently two pier columns and foundations which will be removed, as the new bridge will fully span the Creek without piers. One of the pier columns and its foundation is in riparian habitat. Approximately 0.0003 acre (13 square feet) of riparian area will be created through the removal of this pier column's foundation. This restored area is subtracted from the permanent impact areas estimate totals, as this will cause a net gain of riparian and streambed habitat.

Avoidance, Minimization, and/or Mitigation Measures

Measures identified in Section 2.3.2 (Wetlands and Other Waters) for contour restoration and Section 2.3.5 (Invasive Species) for revegetation plans will

minimize impacts to natural communities. Compensatory mitigation for natural communities is not necessary because the project will only temporarily impact natural communities and will ultimately result in a net benefit from the removal of piers. The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to natural communities.

2.3.2 Wetlands and Other Waters

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 Clean Water Act (33 United States Code 1344), is the primary law regulating wetlands and surface waters. One purpose of the Clean Water Act is to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the Ordinary High Water Mark, in the absence of adjacent wetlands. When adjacent wetlands are present, Clean Water Act jurisdiction extends beyond the Ordinary High Water Mark to the limits of the adjacent wetlands. To classify wetlands for the purposes of the Clean Water Act, 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 Clean Water Act.

Section 404 of the Clean Water Act 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 will be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers with oversight by the U.S. Environmental Protection Agency.

The U.S. Army Corps of Engineers 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 U.S. Army Corps of Engineers' Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the U.S. Army Corps of Engineers' decision to approve is based on compliance with U.S.

Environmental Protection Agency's Section 404(b)(1) Guidelines (40 Code of Federal Regulations 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. Environmental Protection Agency in conjunction with the U.S. Army Corps of Engineers and allow the discharge of dredged or fill material into the aquatic system (waters of the United States) only if there is no practicable alternative which will have less adverse effects. The Guidelines state that the U.S. Army Corps of Engineers may not issue a permit if there is a "least environmentally damaging practicable alternative" to the proposed discharge that would have lesser effects on waters of the United States, 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, Executive Order 11990 states that a federal agency, such as the Federal Highways Administration and/or Caltrans, 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 the State Water Resources Control Board, the Regional Water Quality Control Boards and the California Department of Fish and Wildlife. 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 the California Department of Fish and Wildlife before beginning construction. If the California Department of Fish and Wildlife determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. California Department of Fish and Wildlife 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 U.S. Army Corps of Engineers may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the California Department of Fish and Wildlife.

The Water Resources Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the Clean Water Act. In compliance with Section 401 of the Clean Water Act, the Water Resources Control Boards also issue water quality certifications for activities which may result in a discharge to

waters of the United States. This is most frequently required in tandem with a Section 404 permit request. Please see Section 2.2.2 (Water Quality and Storm Water Runoff) for more details.

Affected Environment

This section is based upon the findings identified in the preliminary Jurisdictional Delineation Report (November 2019) and the Natural Environment Study (December 2020) conducted for the proposed project. Wetlands and "other waters" function to improve water quality, detain storm water runoff, recharge groundwater, and provide wildlife habitats. Riparian habitat along stream courses also provides shade cover, helps regulate water temperature, and supports valuable habitat for a variety of wildlife species.

Hydrology of the San Lorenzo River

The San Lorenzo River is a 29.3-mile long river whose headwaters originate in Castle Rock State Park in the Santa Cruz Mountains and flow south by southeast through the San Lorenzo Valley before passing through Santa Cruz and emptying into Monterey Bay and the Pacific Ocean. It is the primary tributary of the San Lorenzo River Watershed and flows into the San Lorenzo River Lagoon, which is a large estuary that drains the 140-square-mile watershed. The river carries water all year long with higher levels and increased flow during the rainy season. A stream or river that normally has water in its channels at all times is described as perennial.

Clean Water Act Wetland Delineation

Surveys identified a small area near the roadside on the southwest side of the San Lorenzo River bridge as a potential slope wetland. The hydrology of this small palustrine emergent wetland is derived from precipitation, runoff, and groundwater discharge at the base of a slope. The predominant vegetation is yellow nutsedge (*Cyperus esculentus*), willow herb (*Epilobium brachycarpum* and *E. ciliatum*), and curly dock (*Rumex crispus*). Vegetation in the surrounding upland area is characterized by coast redwood (*Sequoia sempervirens*) and English ivy (Hedera helix).

Other Waters Delineation

Within the biological study area, the San Lorenzo River flows through a highly confined valley with very steep bedrock slopes on either side extending up to the roadway above. There is no available floodplain habitat, and little evidence of a topographic break in slope is visible at the Ordinary High Water Mark. Drift deposits provide the clearest evidence of the Ordinary High Water Mark elevation. The existing bridge abutment extends out from the bank on the northwest side of the bridge. The soil composition changes from bedrock to unconsolidated sediment halfway up the slope. There is little vegetation within the Ordinary High Water Mark due to the bedrock slopes.

Riparian and Streambank

Vegetation immediately along the channel is sparse to lacking due to the bedrock banks. The riparian zone and streambank were delineated to encompass the shrubs and trees that overhang the San Lorenzo River. Tree species within the riparian zone include coast redwood, red alder, sycamore, and tanoak.

Hydrology of the Kings Creek

Kings Creek is a 7-mile long creek that starts just outside Castle Rock State Park near State Route 35 at an elevation of 3,000 feet and flows south to joins the San Lorenzo River near State Route 9 north of the unincorporated community of Boulder Creek. During the rainy season, it is a major contributor to the water flow of the San Lorenzo River and is fed by rainfall and several springs. The creek generally flows all year-round, except in extreme drought years during the very late summer and early fall before the rainy season.

Clean Water Act Wetland Delineation

No wetland areas were identified within the Kings Creek biological study area.

Other Waters Delineation

Within the biological study area, the right bank (looking downstream) occurs along the outer bend of the channel, and it is steep and armored with concrete sack protection. A vertical concrete retaining wall extends along the right bank upstream from the sacked concrete slope and upstream from the biological study area. Downstream from the sacked concrete slope, the slope is very steep, with limited vegetation and signs of erosion. The slope of the left bank is more gradual, and it provides a distinct floodplain bench upstream from the bridge. Downstream from the bridge, the slope of the bank is more gradual and consistent along its length. Evidence of bank scour within the channel and the transition in slope on the left bank provided an indicator of the location of the Ordinary High Water Mark. The two existing bridge pier columns and their foundations occur at the Ordinary High Water Mark transition.

Environmental Consequences

There are two categories of impacts discussed, permanent and temporary. Permanent impact areas include those areas that will be permanently impacted through pavement or shoulder backing. Temporary impact areas are characterized by work areas that will ultimately be restored to pre-project or better conditions. There are also portions of the permanent and temporary impact areas that overlap with the existing road alignment. These areas were previously paved and will continue to be paved therefore they will be discussed as Existing Highway, and Road Shoulder and Paved Pullouts. Pier columns and foundations that are located at Kings Creek Bridge will be removed and are discussed as areas to be restored.

Removal and replacement of each bridge will require temporary impacts to provide construction access and work areas through the riparian areas and streambeds. All impacts to the riparian habitat will be temporary and include tree and vegetation removal, clearing and grubbing, and ground compaction and disturbance. This work will provide access from the highway to the streambed. All work areas will be graded to original contours, and the vegetation will be restored.

For both bridges, a stream diversion will be required to create a dry work area to remove the existing bridge structures and piers, which will be a temporary impact to the streambed habitat. The diversion will ensure that no debris from the pier will be dropped into the streambed and will provide access to build the new bridge structures. The existing pier columns and foundations that currently infringe on the Kings Creek riparian and continually flowing stream habitat will be removed, which will naturalize the jurisdictional areas and provide additional habitat, a net benefit to the biological study areas. Work in the stream will only occur in the dry season from June through October. After work for each season, the diversion will be removed, and the streambed will be returned to natural grade and contour until the following work season commences.

Work in jurisdictional areas will occur in the dry season for up to three years, when the San Lorenzo River and Kings Creek will be flowing at their lowest velocity and volume. All tree and shrub removal will be replaced after construction work is completed to replace riparian habitat as quickly as possible. Within the riparian zone, non-native trees that are removed will be replaced with native trees at a minimum 1:1 ratio and native trees will be replaced at minimum a 3:1 ratio. This ratio may increase as required by regulatory agency permit conditions. A mitigation and monitoring plan will be used to ensure restoration of the disturbed riparian corridor will occur. Specific replacement plants, erosion control material, native seed mixtures, and an invasive weed treatment plan will be described in detail in in the mitigation and monitoring plan. The final mitigation and monitoring plan will be consistent with the agency requirements as written in the 404, 401, and 1602 permits and will be reviewed and approved through the regulatory review process.

As discussed in Section 2.2.2 (Water Quality) demolition and construction phases of the project will generate sediment, but if a cofferdam is constructed for the removal of pier foundations, the impact on water quality will be reduced. The appropriate best management practices will be deployed to control sediment transport into the stream channel resulting from abutment removal and installation. Degradation of water quality will be minimized through proper engineering controls. Oil, grease, and other pollutants, including metals and pesticides, are not expected to enter the waterways when proper best management practices are applied to construction activities.

San Lorenzo River Bridge

The San Lorenzo River within the biological study area serves to transport water without much change in shape as sediment and flow increases, but it does not provide for significant flood storage or slow water dispersal. Based on its highly confined position and limited density of surrounding vegetation, this segment of the river is expected to provide only limited potential for biogeochemical cycling and water quality filtration. The steep slopes surrounding the river segment are likely a source of fine sediment caused by erosion. The deep pools and cobble layers within the segment provide potential habitat for spawning, migrating, and rearing salmonids. The highly confined nature of the reach, in addition to the overhanging riparian vegetation provide shade, which supports cool, year-round habitat.

The project will not permanently impact wetlands and other waters at the San Lorenzo Bridge site. Potential temporary impacts include equipment staging areas, access roads and work areas needed to construct the new and remove the existing bridge. These impacts will involve tree and vegetation removal, grading, compaction by construction equipment, and foot traffic related to construction and utility work. All temporary work areas in the riparian zones will be returned to the original grade and contour and revegetated after construction. Estimated temporary impacts will total 0.277 acre (12,066 square feet) and will include areas in the San Lorenzo River that will be fully diverted, access roads through riparian zones to reach the river, and ruderal roadside vegetation that will be required for equipment storage.

The project will have temporary impacts to Wetlands and Waters of the United States and State of California, as the bridge replacement will require working in and diverting the water of the San Lorenzo River to allow for construction of the new bridge and demolition of the existing bridge, as well as widening the paved area to allow for the necessary guardrail and taper. Impacts to the slope wetland feature found southwest of the bridge will total 0.001 acre (43.6 square feet). The functions of delineated wetlands are mainly associated with water quality filtration. This slope wetland does not trap water, and its vegetation coverage provides little potential to slow significant runoff. Similarly, the habitat value of the wetland is low because of its direct exposure to the adjacent highway and lack of vegetative complexity.

Wetland impacts are considered temporary, because the wetland will be restored adjacent to the road, but it will be shifted slightly to the west. The adjacent slope will be contoured to maintain the existing hydrologic source to the slope wetland. Estimated impacts below the Ordinary High Water Mark of the San Lorenzo River will total 0.032 acre (1,395 square feet) and be temporary in nature. Impacts to the associated riparian zone along the San Lorenzo River will total 0.022 acre (960 square feet) and will also be temporary in nature.

Kings Creek Bridge

Kings Creek within the biological study area provides opportunities for flood water storage and slow dispersal along the left bank. The vegetated bench provides opportunities for biogeochemical cycling and water quality filtration. The uniform armored right bank does not support the slow dispersal of flows or water quality filtration. The creek itself provides spawning, migratory, and rearing habitat for salmonids. The riparian area also supports foraging and dispersal opportunities for wildlife.

Permanent impacts at Kings Creek will be limited to the removal of two piers, as the new bridge will fully span the creek without piers. The piers will be removed and the riparian area where the piers currently exist will be restored to natural conditions. This area totals 0.0005 acre (22 square feet). One of the piers is located in the riparian habitat area, and the other is located below the Ordinary High Water Mark.

Temporary impacts include equipment staging areas, access roads, and work areas. These impacts will involve tree and vegetation removal, grading, compaction by construction equipment, and foot traffic related to construction and utility work. All temporary work areas in the riparian zones will be returned to the original grade and contour and revegetated after construction. These areas will total 0.192 acre (8,364 square feet).

The project will impact Wetlands and Waters of the United States and State of California, as the bridge replacement will require working in and diverting the waters of Kings Creek to allow for construction of the new bridge and demolition of the existing bridge. Estimated temporary impacts below the Ordinary High Water Mark of Kings Creek will total 0.022 acre (960 square feet). Impacts to the associated riparian zone along Kings Creek will total 0.015 acre (650 square feet) and will be temporary in nature.

Riparian and Streambank

The affected riparian area is limited to the southern bank of Kings Creek, including the bench area upstream of the bridge and the vegetated bank downstream from the bridge. Vegetation within the bench is predominated by non-native, invasive Himalayan blackberry (Rubus armeniacus) and English ivy (Hedera helix) upstream from the bridge. On the downstream side of the bridge, on the left bank, the bench is vegetated with native vegetation including red alder and thimbleberry (Rubus parviflorus). The bank is unvegetated under the bridge. The entire northern bank is developed with existing concrete sack slope protection.

U.S. Army Corps of Engineers Jurisdiction Summary

Surveys conducted for the project identified a total of 0.055 acre (2,400 square feet) of potential U.S. Army Corps of Engineers jurisdictional waters within the San Lorenzo River and Kings Creek Bridge biological study areas.

This includes 0.054 acre (2,350 square feet) of perennial stream below the Ordinary High Water Mark and 0.001 acre (43.6 square feet) of slope wetland. This reflects the findings of the field investigation for the preliminary Jurisdictional Delineation Report prepared for the project and may be subject to final verification by the U.S. Army Corps of Engineers San Francisco District, South Pacific Division. See Table 2.3. ***Caltrans will coordinate with the U.S. Army Corps of Engineers during the Plans, Estimates, and Specifications phase of the project through the submittal of a Nationwide Permit and Pre-construction Notification, which does not require a Jurisdictional Determination. The preliminary Jurisdictional Delineation Report will be included with the permit and notification.**

Table 2.3 U.S. Army Corps of Engineers Preliminary Jurisdictional Impact Area Project Totals

Jurisdictional Area	Permanent Impacts	Temporary Impacts
Perennial Stream	0 acre	0.054 acre
Slope Wetland	0 acre	0.001 acre
Total Impacts	0 acre	0.055 acre

Regional Water Quality Control Board Waters of the State Summary

A total of 0.092 acre (4,008 square feet) falls within Regional Water Quality Control Board jurisdiction. This includes 0.054 acre of perennial stream and 0.001 acre of wetland, and 0.037 acre (1,610 square feet) of "other riparian" areas in the biological study areas. The riparian areas occur above the Ordinary High Water Mark. This reflects the findings of the field investigation for the preliminary Jurisdictional Delineation Report and may be subject to final verification by Regional Water Quality Control Board. See Table 2.4.

Table 2.4 Regional Water Quality Control Board Preliminary Waters of the State Impact Area Totals

Jurisdictional Area	Permanent Impacts	Temporary Impacts
Perennial Stream	0 acre	0.054 acre
Riparian	0 acre	0.037 acre
Slope Wetland	0 acre	0.001 acre
Total Impacts	0 acre	0.092 acre

California Department of Fish and Wildlife Jurisdiction Summary

Survey delineated a total of 0.091 acre (3,964 square feet) within California Department of Fish and Wildlife jurisdiction. This includes 0.054 acre of perennial streambed and 0.037 acre of "riparian" areas in the biological study areas. This reflects the findings of the field investigation for the preliminary Jurisdictional Delineation Report and may be subject to final verification by California Department of Fish and Wildlife. See Table 2.5.

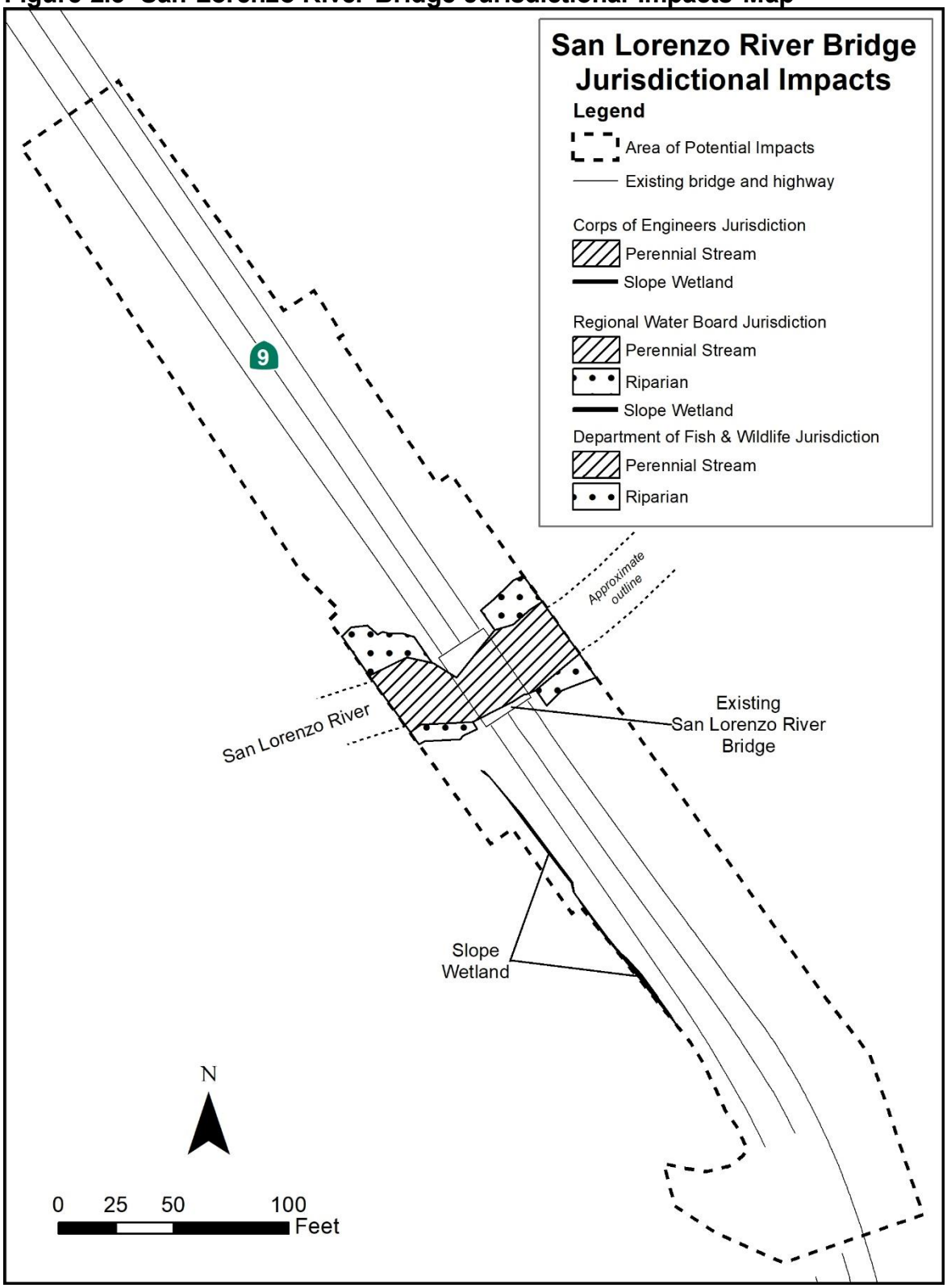
Table 2.5 California Department of Fish and Wildlife Preliminary Jurisditional Impact Area Totals

Jurisdictional Area	Permanent Impacts	Temporary Impacts
Perennial Stream	0 acre	0.054 acre
Riparian	0 acre	0.037 acre
Total Impacts	0 acre	0.091 acre

Figure 2.3 shows impacts to jurisdictional areas that will be caused by replacement of the San Lorenzo River Bridge. Figure 2.4 shows impacts to jurisdictional areas that will be caused by replacement of the King Creek Bridge.

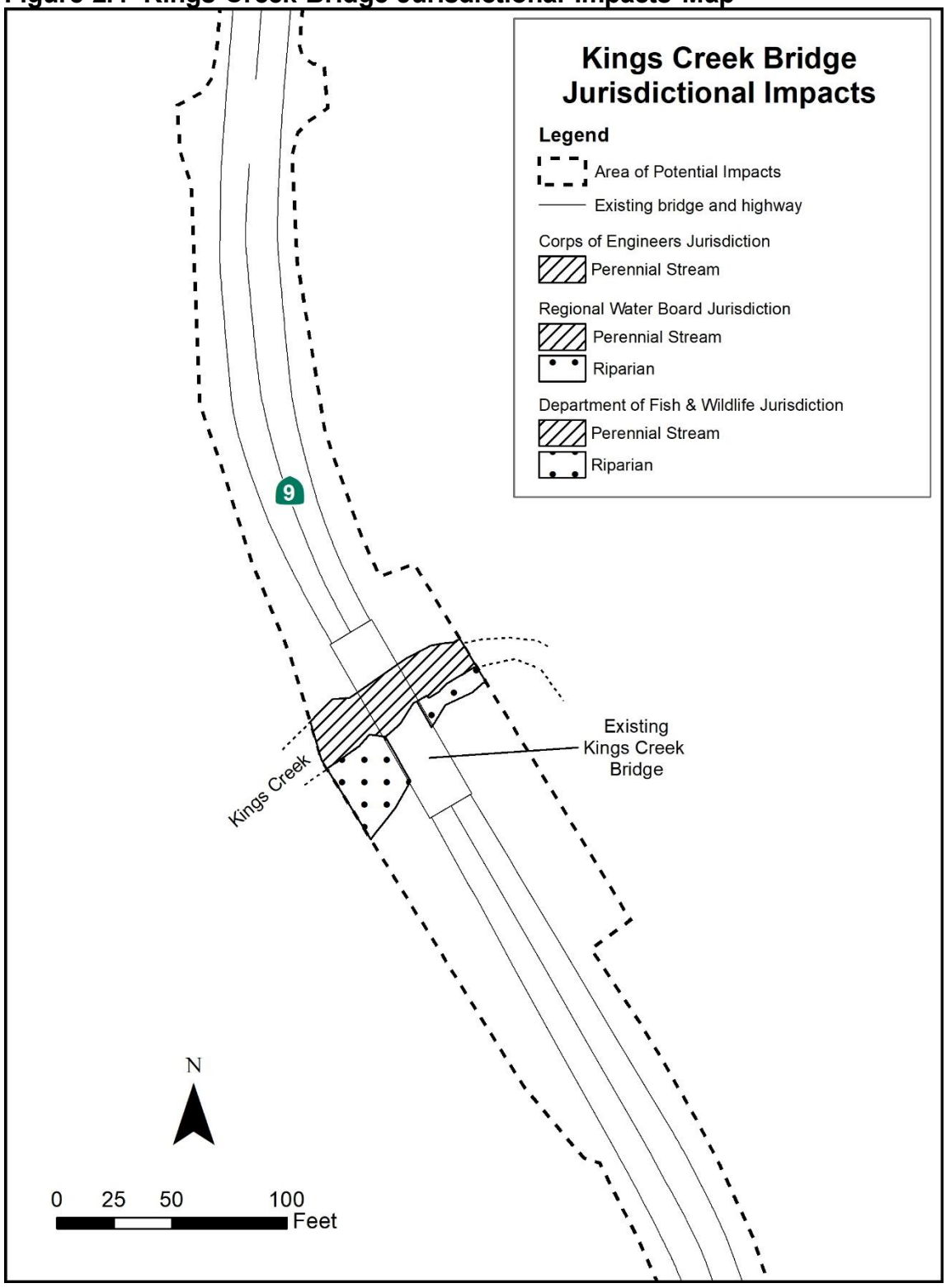
Caltrans standard water quality and construction site Best Management Practices and Standard Specifications for pollution control identified in Section 2.2.2 (Water Quality and Storm Water Runoff) will be included as standard project features will also minimize temporary construction impacts to wetlands and other waters. Prior to construction, Caltrans will prepare a Mitigation and Monitoring Plan to monitor avoidance and minimization efforts for impacts to wetlands and other waters. The plan will be consistent with federal and state regulatory requirements and will be amended with any regulatory permit conditions, as required. Caltrans will implement the Mitigation and Monitoring Plan as necessary during construction and immediately following project completion.

Figure 2.3 San Lorenzo River Bridge Jurisdictional Impacts Map



***The reader should note that this figure has changed since the draft document.**

Figure 2.4 Kings Creek Bridge Jurisdictional Impacts Map



Avoidance, Minimization, and/or Mitigation Measures

Impacts to jurisdictional areas within the project sites are necessary to provide work and access areas to the San Lorenzo and Kings Creek Bridges. All temporary impacts will be restored. Compensatory mitigation for permanent impacts to jurisdictional areas is not expected because the project will only temporarily impact wetlands and other waters and will ultimately result in a net-benefit from removal of the two pier columns. The following measures will be implemented to further avoid and minimize potential impacts to jurisdictional areas resulting from the project:

- **Environmentally Sensitive Area Fencing CEQA Mitigation**—Prior to any ground-disturbing activities, temporary environmentally sensitive area fencing will be installed around jurisdictional resources and all work limits, to ensure no impacts occur outside the project limits. Environmentally sensitive areas will be included on design plans and delineated in the field prior to the start of construction activities.
- **Hazardous Materials Spills CEQA Mitigation**—During construction, all project-related hazardous materials spills within the project site will be cleaned up immediately. The contractor will be required to always keep readily accessible spill prevention and cleanup materials on site during construction.
- **Erosion Control CEQA Mitigation**—During construction, the contractor will implement erosion control measures. Temporary Large Sediment Barriers and fiber rolls will be installed as needed between the project site and jurisdictional waters and riparian habitat. ***The contractor will be prohibited from using synthetic geotextiles material and synthetic filter fabrics for erosion control.**
- **Vehicle Cleaning and Refueling CEQA Mitigation**—During construction, the cleaning and refueling of equipment and vehicles will occur only within a designated staging area. This area will either be a minimum of 100 feet from jurisdictional areas or surrounded by barriers (for example, fiber rolls or equivalent) if it is less than 100 feet from aquatic areas. The staging areas will conform to Caltrans 2017 Construction Site Best Management Practices.
- **Contour Restoration CEQA Mitigation**—Each season after construction has been completed in jurisdictional areas, contours will be restored as close as possible to their original condition.

2.3.3 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, and the California Department of Fish and Wildlife are responsible for implementing these laws. This section discusses

potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in the Section 2.3.4 (Threatened and Endangered Species) of this document. All other special status animal species are discussed here, including California Department of Fish and Wildlife fully protected species and species of special concern, and U.S. Fish and Wildlife Service or National Oceanic and Atmospheric Administration Fisheries 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

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

Affected Environment

The information and analysis contained in this section are based on the Natural Environment Study prepared by Caltrans in December 2020 for the proposed project. General wildlife surveys were conducted on March 18, June 18, and July 3 of 2019.

Common Fish and Wildlife

A variety fish and wildlife inhabit the waterways in the San Lorenzo River Watershed (including the project reach of the San Lorenzo River and Kings Creek). Some common species of fish include the coast-range sculpin, coho salmon, inland threespine stickleback, Monterey roach, Pacific lamprey, pink salmon, prickly sculpin, Sacramento speckled dace, and steelhead trout. The area is home to numerous species of birds, amphibians, and reptiles that feed on a variety of invertebrate and insect species. Black-tailed deer and a subspecies of mule deer are common, as are western gray squirrels, chipmunks and raccoons. Periodic sightings of black bears indicate they frequent the mountains or wander north from Big Sur, where black bears are established. Foxes, coyotes, bobcats, cougars, and non-native Virginia opossums also inhabit the region. Rattlesnakes can also be found in the area, but mostly in the high, dry chaparral.

The biological study areas include habitat for five special status animal species and other nesting and migratory birds, which are discussed below.

California Giant Salamander

The California giant salamander (*Dicamptodon ensatus*) is listed as a California State Species of Concern based on its vulnerability. The species is at moderate risk of extinction due to a restricted range, relatively small populations, and recent and widespread decline. They occur along the California coast from Mendocino County to Monterey County all year long. They are typically found in humid coastal redwood and conifer forests. Aquatic adults and larvae are found in cool, rocky streams in forests. Terrestrial adults feed on invertebrates such as snails and slugs, and possibly small mammals, reptiles, and amphibians. Aquatic adults and larvae eat aquatic invertebrates, fish, and other aquatic amphibians. California giant salamanders are expected to be primarily nocturnal but may be active during the daytime. Adults have been observed active on rainy nights moving towards streams.

This species is known to breed in strong flowing, deep streams. Adults stay under rocks and logs outside the breeding season near perennial streams and then move into streams during fall rains events and spend the breeding season in streams. Eggs are laid in spring between March and May in flowing cold-water springs, channels, and streambanks beneath debris and rocks. It is expected that younger larva exists in shallow, slow-moving water near younger salamanders, and older larva and adults live in the main stream channel under large objects. Cold and flowing water are preferred for egg-laying sites and for aquatic adult and larvae.

The biological study areas for both bridges contain wet riparian and redwood forest on the edge of perennial streams, which could support the California giant salamander. There have been known recorded occurrences of the species within one mile of the biological study area, as recent as 1982. The Kings Creek and San Lorenzo River provide aquatic habitat for the California giant salamander. The nearby upland habitat has plenty of wood, rock, and cover to support California giant salamander. It is likely that the species could exist in the biological study areas.

Santa Cruz Black Salamander

The Santa Cruz black salamander (*Aneides niger*) is listed as a California State Species of Concern based on its vulnerability. This species is at moderate risk of extinction due to a restricted range, relatively small populations, and recent and widespread decline. They live in the hills around Santa Cruz County. The species is typically found on the margins of perennial streams in redwood and mountain forests year-round. They are typically found in moist soils, but they can be tolerant of wet climates. Black salamanders' diet consists of spiders and beetles, typically. They can be found in rockslides, logs, and surface debris on the edges of ravines and river channels. They are usually nocturnal. The salamanders go dormant between April and October and are active between October and March in dry habitats,

but in moist habitats they can be active all year long. Eggs are typically laid in late spring to summer. Santa Cruz black salamanders do not lay eggs in the stream, like other salamanders, but lay in soil cavities or among rocks.

The biological study areas for both bridges contain wet riparian and redwood forest on the edge of perennial streams, which could support the Santa Cruz black salamander. In 1957, there was a recorded occurrence of the species less than 0.5 mile downstream of the biological study area in the San Lorenzo River. The nearby upland habitat has plenty of wood, rock, and cover to support year-round habitat for the Santa Cruz black salamander. It is likely that the species could exist in the biological study areas.

American Peregrine Falcon

The American peregrine falcon (*Falco peregrimus anatumi*) is a small predatory bird that mostly lives in the Pacific Northwest. Small populations and migratory stops occur in or offshore of old-growth coniferous forests of Monterey County and other areas of the Central and Southern California coasts. They are known to lay nests in the upper branches of redwoods or Douglas-fir forests, as high as 150 feet. The species has been removed from the federal Threatened and Endangered species list but is protected under the federal Migratory Bird Treaty Act. The nearest recorded occurrence is over two miles outside the biological study areas.

Suitable foraging habitat is present in the biological study areas, but appropriate nesting habitat is absent. There are no suitable bare cliffs or tall manmade structures that could provide nesting ledges for a peregrine falcon in the biological study areas. The species was not observed during surveys, but due to the proximity of a known peregrine falcon occurrence, there is a remote possibility a falcon may soar over the biological study areas during construction.

Osprey

Osprey (*Pandion haliaetus*) are large predatory water birds that inhabit ocean shores, bays, fresh-water lakes, and large streams. They are known to build large nests in treetops within 15 miles of a good fish-producing body of water. They are a known wetland species and are also protected under the federal Migratory Bird Treaty Act. The nearest recorded occurrence is over three miles outside the biological study areas.

Suitable foraging habitat is present in the biological study areas. The project areas include large streams that are considered fish habitat, which meets the criteria of habitat for osprey. The species was not observed during surveys, but due to the proximity of a known osprey occurrence, there is a remote possibility an osprey may soar over the biological study areas during project construction.

Other Nesting and Migratory Birds

Other nesting and migratory bird species are addressed here as a group because they have similar habitat requirements, project-related impacts, and avoidance and minimization measures. Numerous nesting bird species have the potential to nest in habitats within the project's biological study areas.

The coast redwood forest habitats surrounding the San Lorenzo River and Kings Creek are dense with tall trees and perennial streams. This habitat is suitable for smaller birds such as chickadees and jays, and ground-nesting birds such as turkeys. Although Kings Creek and the San Lorenzo River are large water systems and do support fish, in the biological study areas the waterways are heavily shaded by trees and do not provide the open foraging habitat that is required for larger predatory bird species. Several species of birds were seen in the biological study areas during surveys, but no nests or nesting activities were witnessed. The biological study areas provide suitable foraging or nesting habitat for some migratory birds.

Environmental Consequences

California Giant Salamander and Santa Cruz Black Salamander

Due to the similarity of species behaviors, habitat, and proposed avoidance and minimization measures, impacts to the California giant salamander and Santa Cruz black salamander are discussed together in this section. The temporary removal of vegetation and debris in the biological study areas will remove upland habitat for the California giant salamander and year-round habitat for the Santa Cruz black salamander. The impact will be temporary since vegetation and debris will be replaced after construction, but the three consecutive years of work will remove habitat for the duration. This may require removal and relocation of individuals from the project footprint to other areas in the biological study areas, if they are present, which could stress the animals or displace them. Removing habitat could require individuals to move farther away for resources and access to continually flowing stream habitat, which may require them to expend additional energy. If individuals are present and are not removed from the project area, they may be crushed by large equipment or foot traffic.

Diverting the San Lorenzo River and Kings Creek will temporarily remove aquatic habitat for the California giant salamander. The species will need to be relocated and excluded from the diversion area in order to place the pipes without crushing or burying individuals. If they are found, handling and relocating the species may cause additional stress to the animal. Moving the species and excluding it from its natural location may make it more difficult for the animal to find suitable cover and food resources. The animal may have to move further to find resources. If the diversion plan increases flows downstream of the footprint, the water velocity may crush salamanders and eggs which are lodged in crevices between cobbles. This may cause death or harm from being flushed out of their current location, and they may be moved

to unsuitable habitat downstream where they would need to expend more energy to find cover and food resources.

American Peregrine Falcon, Osprey, and Other Nesting and Migratory Birds

Due to the similarity of species behaviors, habitat, and proposed avoidance and minimization measures, impacts to the American peregrine falcon, osprey, and other nesting and migratory birds are discussed together in this section. Estimates of impacts to potential nesting habitat for migratory nesting birds throughout the biological study areas are represented as impacts to riparian coast redwood habitat.

Temporary impacts to potential nesting habitat could occur mostly due to temporary construction access. The removal of vegetation could directly impact active bird nests and any eggs or young residing in nests, but only if vegetation is removed during nesting bird season (February 1 through September 30). Indirect impacts could also result from noise, and dust associated with construction. Noises created by large construction equipment could alter perching, foraging, and/or nesting behaviors. Dust could disturb air quality, reduce sight visibility, and hide insects available for foraging passerines. Riparian trees are anticipated to be removed, which could alter perching, foraging, and/or nesting behaviors. The understory vegetation surrounding these trees will also be removed, which could disturb prey items such as insects and small mammals or reptiles. Removal of potential nesting trees for three consecutive work seasons could temporarily reduce the availability of nesting and roosting habitat. Since no raptors are currently nesting in the biological study areas, there is no expectation that construction could inhibit nest success for those species.

Avoidance, Minimization, and/or Mitigation Measures

California Giant Salamander and Santa Cruz Black Salamander

The avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing and in Section 2.3.4 (Threatened and Endangered Species) for worker education programs proposed to protect Central California Coast Coho Salmon Critical Habitat apply to California giant salamander and Santa Cruz black salamander as well. The following measures will also be implemented to avoid and minimize potential impacts to California giant salamander and Santa Cruz black salamander:

- **Preconstruction Surveys CEQA Mitigation**—Preconstruction surveys for salamanders will occur before construction begins. If individuals are found, salamanders, larvae, and eggs will be relocated outside the project footprint in suitable habitat.
- **Initial Ground Disturbance CEQA Mitigation**—California Department of Transportation-approved biologist(s) will be present during initial ground

disturbance to monitor debris removal and relocate any salamanders that are found during preconstruction surveys.

- **Exclusion Fencing CEQA Mitigation**—Prior to dewatering/diversion of the Kings Creek and the San Lorenzo River, the contractor will install exclusion fencing to keep all salamanders from entering the project areas.
- **Aquatic Salamander Relocation CEQA Mitigation**—As dewatering occurs in the San Lorenzo River and Kings Creek, California Department of Transportation-approved biologist(s) will be present to relocate all aquatic salamanders, larvae, and eggs from the diversion footprint. Salamanders will be identified and relocated to suitable habitat outside the exclusion fence.
- **Habitat Restoration CEQA Mitigation**—All woody debris and large boulders will be stockpiled and replaced on site after construction. After construction, all vegetation removed will be replaced in coordination with a qualified biologist to provide suitable habitat for California giant salamander and Santa Cruz black salamander.

Compensatory mitigation is not expected because the project will only temporarily impact salamander species and their habitat.

American Peregrine Falcon, Osprey, and Other Nesting and Migratory Birds

The avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing and in Section 2.3.4 (Threatened and Endangered Species) worker education programs proposed to protect Central California Coast Coho Salmon Critical Habitat apply to American peregrine falcon, osprey, and other native and migratory birds as well. The following measures will also be implemented to avoid and minimize potential impacts to American peregrine falcon, osprey, and other native and migratory birds resulting from the project:

- **Vegetation Removal CEQA Mitigation**—If feasible, vegetation removal and tree trimming shall be scheduled to occur between October 1 and January 31, outside of the typical nesting bird season, which is February 1 to September 30.
- **Nesting Bird Preconstruction Survey CEQA Mitigation**—If vegetation removal or other construction activities are proposed to occur during the nesting season (February 1 to September 30), then a nesting bird survey will be conducted by a California Department of Transportation biologist no more than 14 days prior to removal or construction.
- **Active Nest Buffer CEQA Mitigation**—If an active bird nest is found, a qualified biologist will determine an appropriate Environmentally Sensitive Area buffer (typically 100 feet around active perching bird nests and 500 feet for active bird of prey or raptor nests) or monitoring strategy based on the habits and needs of the species. The buffer area will be avoided, or a

monitoring strategy will be implemented until a California Department of Transportation biologist has determined that juveniles have fledged.

- **Tree Protection CEQA Mitigation**—Trees to be removed will be noted on design plans. Prior to any ground-disturbing activities, high-visibility fencing or flagging will be installed around the dripline of trees to be protected within the project limits.
- **Rodent Control Restrictions CEQA Mitigation**—To avoid secondary poisoning of raptors that hunt and feed on rodents and other small animals, no rodent control pesticides will be used in the project area, including anticoagulant rodenticides such as brodifacoum, bromadiolone, difethialone and difenacoum.

Compensatory mitigation is not expected because the project will only temporarily impact American peregrine falcon, osprey, and other nesting and migratory bird habitat which will be replaced in the riparian zones after the new bridges are completed.

2.3.4 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the federal Endangered Species Act: 16 United States Code Section 1531, et seq. See also 50 Code of Federal Regulations Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (and Caltrans, as assigned), are required to consult with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service to ensure that 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 or a Letter of Concurrence. Section 3 of the federal Endangered Species Act defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the California Endangered Species Act, California Fish and Game Code Section 2050 and following sections. The California Endangered Species Act emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The California Department of Fish and Wildlife is the agency responsible for implementing the California Endangered Species Act. Section 2080 of the California 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 California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California Endangered Species Act allows for take incidental to otherwise lawful development projects; for these actions an Incidental Take Permit is issued by the California Department of Fish and Wildlife. For species listed under both federal Endangered Species Act and the California Endangered Species Act requiring a Biological Opinion under Section 7 of federal Endangered Species Act, the California Department of Fish and Wildlife may also authorize impacts to California Endangered Species Act species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

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

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with the Secretary of Commerce regarding any action or proposed action authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat, which is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The National Marine Fisheries Service has provided further clarification that "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include historical areas if 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 contribution of species to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a full life cycle of species. The definition of Essential Fish Habitat may include habitat for an individual species or an assemblage of species, whichever is most appropriate to the specific fishery management plan. In coordination with the National Marine Fisheries Service, the Pacific Fishery Management Council develops and amends fishery management plans for fisheries in waters off the coast of Washington, Oregon, and California.

Affected Environment

***The information and analysis contained in this section are based on the December 2020 Natural Environment Study and August 2020 Biological Assessment prepared by Caltrans for the proposed project.** Caltrans consulted with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to obtain lists of federally threatened and endangered species that could potentially be within the project area. A current list of special status species potentially within the project area was obtained from the California Natural Diversity Database. Copies of these lists are provided in Appendix E of this document.

Field surveys were conducted in the biological study areas for threatened and endangered plant species in 2018 and 2019 and for wildlife in 2019. Though listed as potentially occurring within the region, no observations of or suitable habitat for the following listed rare, threatened, and endangered plant and animal species occurred during seasonally appropriate field surveys.

- Ben Lomond spineflower (*Chorizanthe pungens, hartwegianna* variety). There are no ponderosa pine sandhills to support the species.
- Ben Lomond wallflower "Santa Cruz wallflower" (*Erysimum terettifolium*). There are no inland marine sands to support the species within the biological study areas.
- Marsh sandwort (*Arenaria paludicula*). The biological study areas are more than 150 miles from the only two known natural occurrence locations (Black Lake Canyon and Oso Flaco Lake).
- Pacific grove clover (*Trifolium polydon*). No closed-cone coniferous forests, prairies, meadows, or grasslands needed to support the species are present within the biological study areas.
- Santa Cruz cypress (*Hesperocyparis abramsiana, abramsiana* variety). There are no sandstone and granite derived soils with *Pinus attenuate* redwood forests to support the species within the biological study areas.
- Scotts Valley polygonum (*Polygonum hickmanii*). There are no Purisma sandstone or mudstone to support the species within the biological study areas.
- Scotts Valley spineflower (*Chorrizanthe robusta, hartwegii* variety). There are no sandstone or mudstone deposits to support the species within the biological study areas.
- White-rayed pentachaeta (*Pentachaeta bellidiflora*). There are no grasslands or cismontane woodland habitats to support the species within the biological study areas.
- California tiger salamander (*Ambystoma californiense*). There are no ephemeral pools or ponding water bodies that could support California

tiger salamander in the biological study areas. There are not enough small mammal burrows to provide upland refuge for the species.

- Least Bell's vireo (*Vireo bellii pusillus*). The biological study areas do not occur near a known nesting population of least Bell's vireo. The waterways in the biological study areas are perennially flowing deep water streams and do not provide open sandy bottoms that the species prefers. There are redwoods in the biological study areas that provide enough lichens and mosses to build nests, but there is no sign of least Bell's vireo during any surveys. The nearest recorded occurrence is 30 miles southeast of the biological study areas.
- Southwestern willow flycatcher (*Empidonax traillii extimus*). There are no marshes or shrubby clearings in the biological study areas that could provide habitat for the species.
- Tidewater goby (*Eucyclogobius newberryi*). There no lagoons or brackish water present within the biological study area to support tidewater goby.
- Zayante band-winged grasshopper (*Trimerotropis infantilis*). There are no Zayante sandhill ecosystems present in the biological study areas to support the species. The biological study areas are several miles away from any designated Critical Habitat for the species.
- Townsend's big eared bat (*Corynorhinus townsedndii*). There are no rocky, dry habitats that could support a roosting bat colony. The biological study areas are shady due to the presence of tall redwood trees and may not reach high enough temperatures to support roosting bats.
- San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). There are no slow flowing streams in the biological study arras that could support the species. The project is outside the range of the San Francisco garter snake.

Based on a lack of suitable habitat and no observations during seasonally appropriate field surveys, the project will not impact these listed animal species. Therefore, no further discussion of the state-listed species is necessary. However, Federal Endangered Species Act Section 7 effects determinations for federally listed threatened and endangered plant and animal species are summarized in Table 2.6 and Table 2.7 in the following Environmental Consequences for this section.

Butano Ridge Cypress

The Butano Ridge cypress (*Hesperocyparis abramsiana, butaneonsis* variety) is a federally and state listed endangered plant species. This evergreen tree occurs in redwood, closed-cone/cypress forests. Its range is limited to the Santa Cruz Mountains at elevations from 850 feet to 2,600 feet above mean sea level, and the species flowers in October. Seasonally appropriate field surveys found suitable conditions present for the species, which include

openings and edges in a redwood forest that are needed to support the species, but no species were found.

Dudley's Lousewort

Dudley's lousewort (*Pedicularis dudleyi*) is listed as California rare plant species. It is a perennial herb that is found in old coast redwood forests, maritime chaparral, north coast coniferous forests, and valley and foothill grasslands at elevations from 200 feet to 3000 feet above mean sea level. This plant flowers from April through June. Seasonally appropriate field surveys did find suitable conditions in the form of old redwood/coniferous forest within the biological study areas, but the species was not found. Therefore, it is unlikely that the species will be found in the biological study areas during vegetation removal or construction, so no further discussion of this species will occur in this document.

California Red-Legged Frog

The California red-legged frog (*Rana draytonii*) is federally listed as a threatened species with associated areas of designated Critical Habitat needed to support the species. The bridge sites are not located within or near any of the designated Critical Habitat areas identified for the species by the U.S. Fish and Wildlife Service. This amphibian lives in surface water with depths to at least 2.3 feet with sturdy underwater support plants like cattails. California red-legged frogs prefer water habitats with little or no flow. They often find terrestrial refuge in underground mammal burrows. Vernal pools and other seasonal water sources are needed for breeding. Seasonally appropriate field surveys found suitable upland habitat in the biological study areas to support the species in the form of redwood forests that are wet and have deep layers of plant debris. However suitable water habitat was not found since the water sources in the biological study areas are deep and fast flowing without any still pools with little or no flow. No California red-legged frogs were found in the biological study areas, and all recorded observances for this species are over four miles away.

Foothill Yellow-Legged Frog

The foothill yellow-legged frog (*Rana boylii*) is an amphibian that is a California state-listed endangered species. It is known to inhabit lowland and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. The species prefers partly shaded streams and needs some cobble-sized layers for egg-laying. Larva require 11 to 20 weeks of permanent water for development. There are recorded occurrences in the San Lorenzo River a mile upstream and downstream of the San Lorenzo River Bridge, but the closest one was sighted in 1941, and the most recent in the area was recorded in 1951.

Suitable habitat is present in the biological study areas. The project work areas contain permanent sources of deep shady water and cobble-sized

substrate suitable to support egg and larval development. Due to the historic nature of the species occurrences in this area, it is likely this area was once inhabited by the species but is no longer. The species was not observed during surveys, and it is not anticipated that the species will be present in the biological study areas during construction. Therefore, no further discussion of this species will occur in this document.

Federally Designated Critical Habitat and Essential Fish Habitat

Two areas of federally designated Critical Habitats occur within the biological study areas: one for Central California Coast steelhead and one for Central California Coast coho salmon. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service consider the physical and biological features essential to the conservation of the species that may require special management considerations or protection. These elements, called Primary Constituent Elements, must occur in the habitat for it to be considered Critical Habitat. Primary Constituent Elements must occur in the appropriate quantity and spatial arrangement essential to the conservation of the species.

Essential Fish Habitat is generally defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Essential Fish Habitat includes all associated physical, chemical, and biological properties of aquatic habitat that are used by fish. Central California Coast Coho Salmon Essential Fish Habitat is listed on the National Marine Fisheries Service Official Species List for the project region. Essential Fish Habitat for Chinook salmon (*Oncorhynchus tshawytscha*) is also included on the National Marine Fisheries Service Official Species List for the project area, but the project does not occur and will not have a direct or indirect impact on Chinook salmon habitat or range. Since the project is not expected to have any adverse effects to Essential Fish Habitat for Chinook salmon, no further discussion of it will occur in this document.

The San Lorenzo River is the southernmost extent of the Central California Coast coho salmon range. Coho Salmon Essential Fish Habitat falls under the broader category of Pacific Coast Salmon Essential Fish Habitat. The Pacific Fishery Management Council first designated Pacific Coast Salmon Essential Fish Habitat in 2001 as part of Amendment 14 to the Pacific Coast Salmon Fishery Management Plan, and it has been updated since by recent amendments (PFMC 2005). The most recent definition for Pacific Coast Salmon Essential Fish Habitat includes “all streams, estuaries, marine waters, and other water bodies occupied or historically accessible to salmon in Washington, Oregon, Idaho, and California.” Coho Salmon is the only covered species in the biological study areas under the Essential Fish Habitat boundaries.

There are two freshwater riverine systems that can support the Central California Coast coho salmon in the biological study area, Kings Creek and San Lorenzo River, and therefore the biological study area supports only

Freshwater Essential Fish Habitat. Freshwater Essential Fish Habitat for coho salmon consists of four major components: spawning and incubation, juvenile rearing, juvenile migration corridors, and adult migration corridors and holding habitat. Freshwater Essential Fish Habitat depends on the following ten conditions to support the above-listed habitat requirements:

- water quality (dissolved oxygen, nutrients, temperature),
- water quantity (depth and velocity),
- riparian stream-marine energy exchanges,
- channel gradient and stability,
- prey availability,
- cover and habitat complexity,
- space,
- habitat connectivity from headwaters to the ocean,
- groundwater stream interactions, and
- substrate composition.

The biological study areas support the two waterways which have cool, deep water with dense riparian systems that provide shade and cover for the species. The riverine systems have appropriate channel slope and stability, as well as space due to the wide, deep channels and presence of perennially deep waters. The substrate composition varies from cobble to sand but can support the species. Habitat connectivity to the headwaters can be somewhat complex. There are 11 partial barriers to fish passage recorded between the headwaters and the biological study areas, but none of these are full passage barriers to coho salmon. The barriers can be described as low flow period barriers that do not limit fish migration in the system in a typical rain year.

Central California Coast Coho Salmon Critical Habitat

The National Marine Fisheries Service designates Critical Habitat based Primary Constituent Elements, also referred to as physical or biological features to the conservation of a species. The specific features are described in the final Critical Habitat ruling and species recovery plans for the associated species. Federally designated Critical Habitat for the Central California Coast coho salmon Evolutionary Significant Unit (*Oncorhynchus kisutch*) occurs within reaches of the San Lorenzo River Watershed in the biological study areas. The Primary Constituent Elements for Central California Coast Coho salmon are listed in the Designation of Critical Habitat of Central California Coast and Southern Oregon/Northern California Coast Coho Salmon (64 FR 24029). ***Central California Coast Coho Salmon Critical Habitat is designated to include all river reaches accessible to listed coho salmon from Punta Gorda in northern California south to the San Lorenzo River in central California, and includes Arroyo Corte Madera Del

Presidio and Corte Madera Creek, tributaries to San Francisco Bay. Critical habitat consists of the water, substrate, and adjacent riparian zone of estuarine and riverine reaches (including off-channel habitats).**

Within the range of the Central California Coast coho salmon Evolutionarily Significant Unit, the life cycle of the species has been broken down into five essential habitat types: juvenile summer and winter rearing areas, juvenile migration corridors, areas for growth and development to adulthood, adult migration corridors, and spawning areas. It is recognized in the Federal Register that juvenile summer and winter ranges and spawning areas are typically found in small headwater streams and side channels, while adult and juvenile migration corridors and areas for development into adulthood are typically found in tributaries as well as mainstream reaches and estuarine zones. Specifically, growth and development into adulthood, item 3, occurs in marine waters. The Federal Register goes on to specifically call out the following essential features for Central California Coast Coho Salmon Critical Habitat: substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions.

The biological study areas for the San Lorenzo River Bridge and Kings Creek Bridge replacement work falls within designated Critical Habitat for Central California Coast coho salmon. The San Lorenzo River and Kings Creek are perennial streams that provide freshwater juvenile rearing habitat, adult and juvenile migration corridors, and potential spawning habitat all year long. The riverine systems in the biological study areas have rocky substrate, clear cool water, and large riparian trees that provide shade, cover, and shelter for fishes. Water flows all year in these deep perennial systems; and therefore, there is an adequate quantity of water to support fish year-round. Juvenile salmonids were seen in the biological study areas, and although the identification of the fishes was not possible, they were likely either Central California Coast coho or steelhead fry.

Central California Coast Steelhead Critical Habitat

Federally designated Critical Habitat for the Central California Coast steelhead Distinct Population Segment occurs within reaches of the San Lorenzo River Watershed in the biological study areas. Central California Coast steelhead (*Oncorhynchus mykiss irideus*) are a species of coastal rainbow trout. The physical and biological features for steelhead Critical Habitat are: 1) freshwater spawning sites with water quality and quantity and substrate to support spawning, incubation and larval development; 2) freshwater rearing sites with water quality, floodplain connectivity, forage habitat and natural cover to support juvenile growth; 3) freshwater migration corridors free of obstructions; 4) estuarine areas for juvenile transition between fresh and salt water; 5) nearshore marine areas for growth and maturation; and 6) offshore marine areas for growth and maturation.

The biological study areas for the San Lorenzo River Bridge and Kings Creek Bridge replacement work falls within designated Critical Habitat for Central California Coast steelhead. ***The Primary Constituent Elements for Central California Coast steelhead are listed in the Critical Habitat for 19 Evolutionary Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho, and California (65 FR 7764).** Critical habitat consists of the water, substrate, and adjacent riparian zone of estuarine and riverine reaches (including off-channel habitats). ***Central California Coast steelhead Critical Habitat is designated from the Russian River to the San Lorenzo River to a lateral extent of ordinary high water in freshwater stream reaches, and to extreme high water in estuarine areas. Critical habitat consists of the water, substrate, and adjacent riparian zone of estuarine and riverine reaches (including off-channel habitats).** The San Lorenzo River and Kings Creek are perennial streams that provide freshwater juvenile rearing habitat, adult and juvenile migration corridors, and potential spawning habitat all year long. The riverine systems in the biological study areas have rocky substrate, clear cool water, and large riparian trees that provide shade cover and shelter for fishes. Water flows all year in these deep perennial systems and therefore there is an adequate quantity of water to support fish year-round. Juvenile salmonids were seen in the biological study areas, and although the identification of the fishes was not possible, they were either Central California Coast coho or steelhead fry.

Central California Coast Coho Salmon Evolutionary Significant Unit

This project lies within range of the Central California Coast coho salmon Evolutionary Significant Unit (*Oncorhynchus kisutch*). The species was originally federally listed as threatened on October 31, 1996 (61 Federal Register 56138), and the status was modified to endangered on June 28, 2005 (70 Federal Register 37160). A recovery plan was released in January of 2012. This species is also listed as California state endangered.

The Central California Coast coho salmon require cool, deep pools with clean flowing water and plenty of dissolved oxygen for spawning, incubation, and rearing. Juveniles require cool stream temperatures all year long because most individuals spend one year rearing in freshwater before migrating from the spawning stream. Adult coho salmon typically migrate from the ocean and estuary waters into fresh water in late fall and winter (mid-November through February). Adult females dig beds in gravel at the head of riffles and deposit eggs.

Coho embryos incubate and normally hatch in 12 weeks, and fry selectively live in deeper, slow-moving pool habitats. Fry thrive in temperature up to 57 degrees and will perish in temperature above 79 degrees. After one year of rearing, juveniles will typically emigrate as smolts to the estuary/ocean in April to May of the following year.

The Central California Coast coho salmon Evolutionary Significant Unit includes all naturally spawned populations of Coho salmon from Punta Gorda

in northern California south to, and including, Aptos Creek, as well as Coho salmon originating from tributaries to San Francisco Bay. The southern-most stream system in California with coho salmon is Aptos Creek, although year-round access into the stream is currently restricted by a sewer line located downstream of State Route 1. However, coho salmon are known to occur all along the coast in Santa Cruz County north of the Pajaro River, including the San Lorenzo River and Kings Creek.

Many west coast salmon and steelhead populations have declined substantially from their historic numbers and now are at a fraction of their historical abundance (Rogers et al. 2016). The National Marine Fisheries Service believes that the Central California Coast coho salmon are still in danger of extinction.

In the San Lorenzo River, specifically, the Central California Coast coho salmon are nearly wiped out. The 2012 Recovery Plan lists several poor watershed and population conditions contributing to decline including: estuary/lagoon habitat, habitat complexity, hydrology, sediment, stream temperature, water quality, and viability. The largest future threats contributing to those factors include channel modification, urban development, roads and railroads, severe weather, and diversions.

The San Lorenzo River Watershed once supported an independent population of Central California Coast coho salmon, but in recent history the population has declined due to urbanization in the Santa Cruz Mountains. The Recovery Plan, written in 2012, stated that the species was nearly wiped out from the watershed. The same report estimated that historically there were 1,600 spawning adults in the stream, but in 2004 the estimates were 55 individuals. There have been ongoing releases of fry and fingerlings from hatcheries, and there have been recent reports of coho salmon in the San Lorenzo River just south of the city of Felton according to consultation with the National Marine Fisheries Service. It is understood that the population in the San Lorenzo River is not thriving as it once was due to recent and historical decline, but that the species does exist in the San Lorenzo River and Kings Creek.

During surveys of the biological study areas, the stream water appeared to be abundant even in the dry season. The water was deeper than five feet, cold, and flowing. There was not an abundance of trash or litter in the streams, but erosion of the streambanks at Kings Creek was an obvious source of sedimentation to the water. Juvenile salmonids were seen in Kings Creek in the shade under the bridge. The fish were not identified at the time, but due to the location they are anticipated to be either Central California Coast coho salmon or steelhead. Due to the known presence of the species in the watershed and the presence of salmonids in the biological study areas, the species is assumed to be present.

Central California Coast Steelhead Distinct Population Segment

The project site falls within range of the Central California Coast steelhead Distinct Population Segment (*Onchorhynchus mykiss irideus*). This species is federally listed as threatened. Steelhead typically follow a cyclical lifestyle, migrating between upstream freshwater habitats to pools of mixed fresh and sea water as they mature, and finally out to open ocean when they have reached maturity. Adult steelhead then migrate back from the Pacific Ocean upstream to spawn in freshwater.

Juveniles typically rear in freshwater streams and rivers for one to three years before out-migrating to the Pacific Ocean during the late winter when winter flows are highest. If juveniles are large enough, they move out to sea within one year, but if not, they may remain in the estuary of their birth stream for additional seasons. Juveniles may remain in the estuary during summer months when the mouth is cut off from the ocean by the formation of a sandbar. Juveniles affected by this delay are usually larger than other juveniles that enter the ocean in the same year. Larger sized juvenile fish generally have a higher survival rate in the ocean, and the lagoon-reared fish represent a large majority of the returning adult spawning population.

After reaching maturity, steelhead have a variety of life histories. Adults may return to the ocean and repeat spawning migrations, become residents in freshwater and continue to spawn for consecutive years without migrating, or die following spawning. Coastal estuaries play an important role in migration of anadromous fishes such as steelhead, because the brackish water can provide a transition period between saltwater and freshwater morphologies. Once mature, adult steelhead enter coastal rivers and streams to spawn during the winter and early spring when storms produce enough flows to breach sandbars at the mouths of freshwater streams, to allow access for fish to swim upstream.

Within the Central California Coast Steelhead Distinct Population Segment, rainfall is restricted typically to winter months (December through March), but the San Lorenzo River and Kings Creek flow all year long. The best in-stream habitat for steelhead throughout its entire range on the Pacific Coast can generally be characterized by clear, cool water with abundant cover (for example, submerged branches, rocks, logs), well-vegetated stream margins, relatively stable water flow, and a 1:1 pool-to-riffle ratio. However, steelhead can also occupy reaches of streams containing less than optimal habitat, particularly in southern California streams.

Steelhead are known to be abundant in the San Lorenzo River watershed. Juvenile salmonid individuals were seen swimming at Kings Creek in the biological study areas during field surveys. Due to the presence of both coho and steelhead in the watershed, it was likely to be either of those species. Due to the known and documented presence of steelhead in the watershed and the presence of juvenile salmonids, presence of the species is assumed.

Marbled Murrelet

Marbled murrelet (Brachyramphus marmoratus) is a listed as a federal threatened species and a state-listed endangered species with associated areas of designated Critical Habitat needed to support the species. The nearest designated Critical Habitat for the species is 2.9 miles away to the south in Henry Cowell Redwood State Park. This bird species is protected by the Migratory Bird Treaty Act. It is mostly found in the Pacific Northwest, but small populations and migratory stops inland and offshore of the old-growth coniferous forests of Monterey County and other parts of the Central and Southern California coastline. The murrelet is the only California alcid species to nest inland. Alcid birds include murres, guillemots, auklets, puffins, and murrelets. Murrelets typically build nest of lichens and mosses in the upper branches of redwoods or Douglas-fir forests, as high as 150 feet. They spend winters at sea. Seasonally appropriate field surveys found suitable habitat present in the form of redwoods in the biological study areas that provide enough lichens and mosses to build nests, but there was no sign of marbled murrelet.

Environmental Consequences

This section discusses the project's potential environmental effects on threatened and endangered species. Potential effects to federally listed threatened and endangered plant species are summarized in Table 2.6.

Table 2.6 Summary of Federal Endangered Species Act Section 7 Effects Determinations for Plant Species

Species Name	Federal Status	Effect Finding
Ben Lomond spineflower	Endangered	No Effect
Ben Lomond wallflower	Endangered	No Effect
Butano Ridge cypress	Threatened	No Effect
Marsh sandwort	Endangered	No Effect
Santa Cruz cypress	Threatened	No Effect
Scott's Valley polygonum	Endangered	No Effect
Scott's Valley spineflower	Endangered	No Effect
White-rayed pentachaeta	Endangered	No Effect

Potential impacts to federally listed threatened and endangered animal species are summarized in Table 2.7.

Table 2.7 Summary of Federal Endangered Species Act Section 7 Effects Determinations for Animal Species

Species Name	Federal Status	Effect Finding	Effect Finding for Critical Habitat (if applicable).
California Central Coast coho salmon	Endangered	May Affect, Likely to Adversely Affect (Formal consultation with National Marine Fisheries Service is required.)	May Affect, Likely to Adversely Affect. (Formal consultation with National Marine Fisheries Service is required.)
California Central Coast steelhead	Threatened	May Affect, Likely to Adversely Affect (Formal consultation with National Marine Fisheries Service is required.)	May Affect, Likely to Adversely Affect (Formal consultation with National Marine Fisheries Service is required.)
California red-legged frog	Threatened	No Effect	No Effect
California tiger salamander	Threatened	No Effect	No Effect
Least Bell's vireo	Endangered	No Effect	No Effect
Marbled murrelet	Threatened	No Effect	No Effect
San Francisco garter snake	Endangered	No Effect	Not Applicable
Southwestern willow flycatcher	Endangered	No Effect	No Effect
Tidewater goby	Endangered	No Effect	No Effect
Zayante band-winged grasshopper	Endangered	No Effect	No Effect

Butano Ridge Cypress

Although seasonally appropriate field surveys found suitable conditions present for the species, which include openings and edges in a redwood forest that are needed to support the species, no species were found. It is unlikely that this species will be found in the project footprint during vegetation removal or construction. There will be no take of the species. The federal Endangered Species Act finding determination is that the project will have No Effects to Butano Ridge cypress; therefore, no further discussion of this species will occur in this document.

California Red Legged Frog

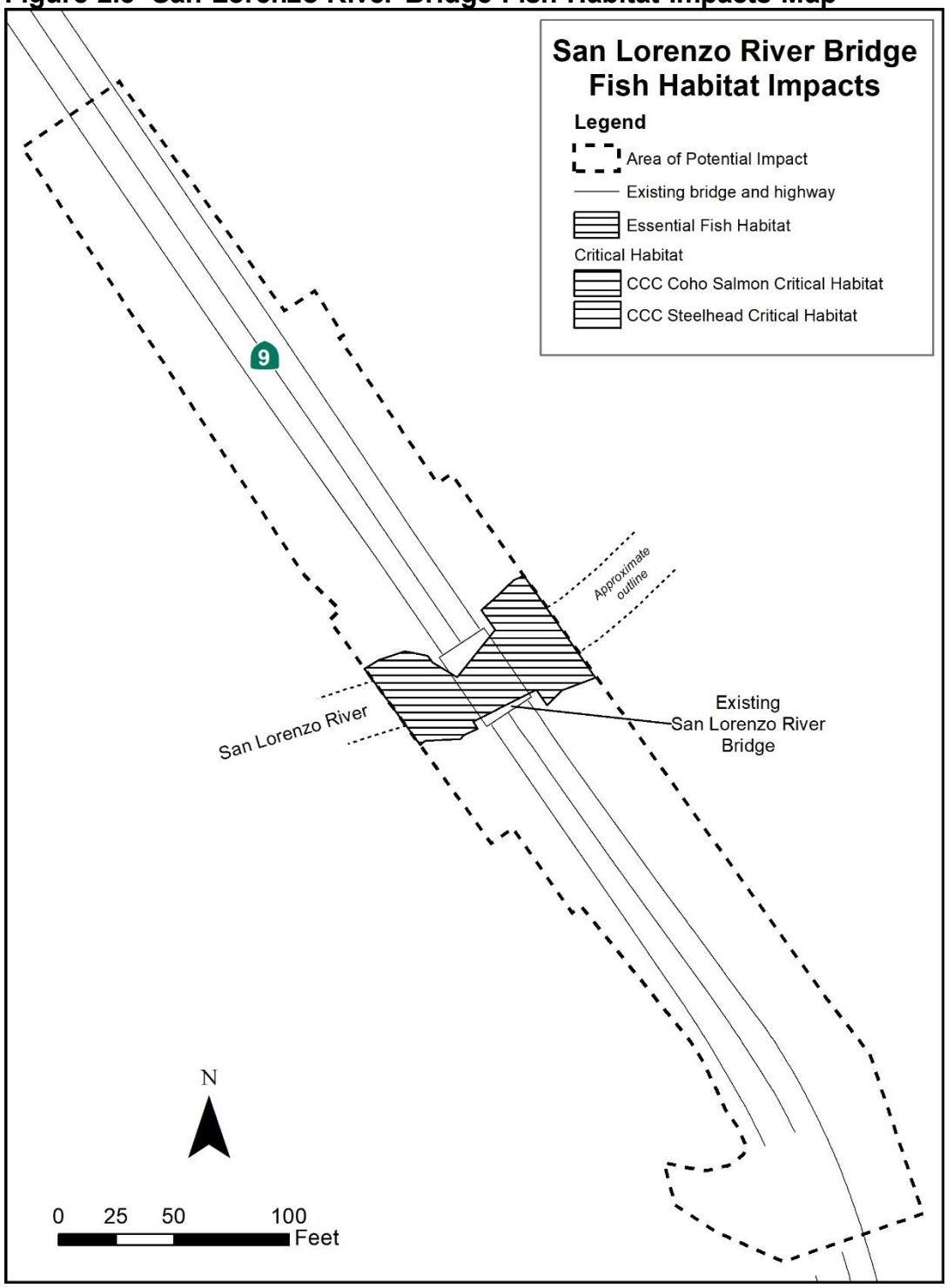
Although seasonally appropriate field surveys found suitable upland habitat in the biological study areas to support the species; however, no suitable water habitat was found in the biological study areas. Also, no California red-legged frogs were found in the biological study areas, and all recorded observances for this species are over four miles away. It is unlikely that the species will be found in the biological study areas during vegetation removal or construction. The federal Endangered Species Act finding determination is that the project will have No Effects to California Red Legged Frog; therefore, no further discussion of this species will occur in this document.

Essential Fish Habitat

The project will have impacts to Essential Fish Habitat for Central California Coast Coho salmon. The boundary for Critical Habitat and Essential Fish Habitat for coho salmon is the Ordinary High Water Mark, as delineated for Section 2.3.2 (Wetlands and Other Waters), therefore the impacts to those habitats is the same as that for the Ordinary High Water Mark, in the previous Wetlands and Waters discussion. Affected acreages for both project sites are listed here, but impacts are discussed in more detail in the evaluation for Central Coast Coho Salmon Critical Habitat and Central California Coast Steelhead Critical Habitat below. The proposed project will cause a total of 0.054 acre (2,350 square feet) of temporary impacts to Essential Fish Habitat, 0.032 acre (1,395 square feet) at the San Lorenzo River and 0.022 acre (960 square feet) at Kings Creek. Kings Creek Bridge replacement will result in a net reduction of permanent man-made structures in Essential Fish Habitat area by 0.0005 acre (22 square feet). Figure 2.5 and Figure 2.6 show the location of potential impacts to Essential Fish Habitat.

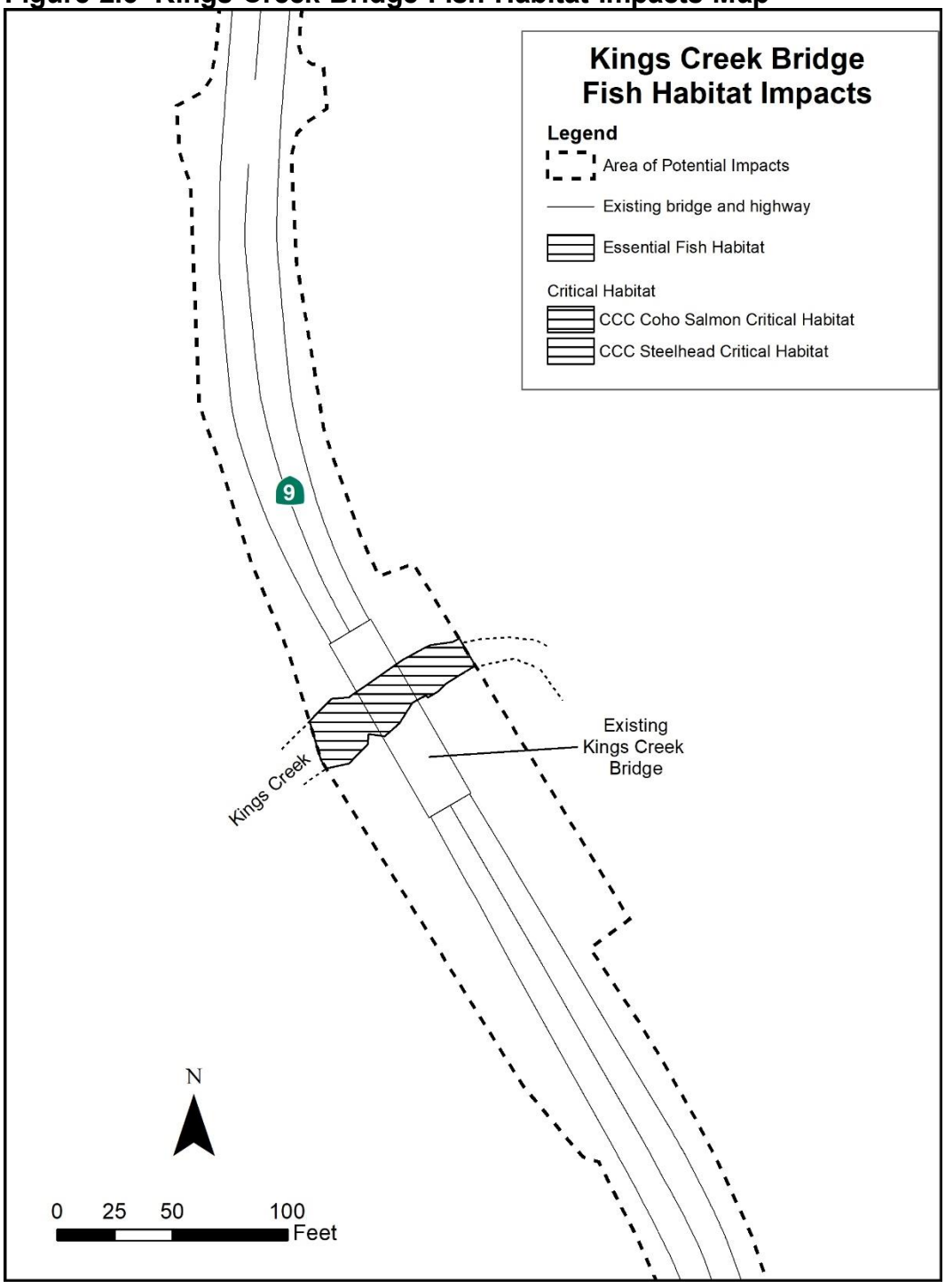
As discussed in Section 2.2.2 (Water Quality) demolition and construction phases of the project will generate sediment, but if a cofferdam is constructed for the removal of pier foundations, the impact on Essential Fish Habitat will be reduced. The appropriate best management practices will be deployed to control sediment transport into the stream channel resulting from abutment removal and installation. Degradation of water quality will be minimized through proper engineering controls. Oil, grease, and other pollutants, including metals and pesticides, are not anticipated to enter the waterways when proper best management practices are applied to construction activities. Standard water quality Best Management Practices from Section 7 (Non-Storm Water Management Best Management Practices) and Section 8 (Waste Management and Materials Pollution) of the Caltrans Construction Site Best Management Practices Manual and Caltrans Standard Specifications for pollution control identified in Section 2.2.2 (Water Quality and Storm Water Runoff) will minimize temporary construction impacts to Essential Fish Habitat. The federal Endangered Species Act finding determination is that the project May Affect and will Likely Adversely Affect Essential Fish Habitat for Central California Coast Coho salmon.

Figure 2.5 San Lorenzo River Bridge Fish Habitat Impacts Map



***The reader should note that this figure has changed since the draft document.**

Figure 2.6 Kings Creek Bridge Fish Habitat Impacts Map



Central California Coast Coho Salmon and Steelhead Critical Habitat

Environmental consequences to designated Central California Coast Coho Salmon Critical Habitat and Central California Coast Steelhead Critical Habitat are discussed together because of the similar scope and degree of potential project impacts. Based on the current area of proposed project impacts, the project will only temporarily impact 0.054 acre of designated Critical Habitat to both species due to the required stream diversion and work in the riverbed at both locations. Figure 2.5 and Figure 2.6 show the location of potential impacts to Critical Habitat areas for Central California Coast coho salmon and Central California Coast steelhead.

Tree removal will be required to create access roads, move utilities, and create construction work areas under each bridge. The removal of shade trees may temporarily increase the amount of sunlight reaching the river and creek in the biological study areas, which may temporarily increase the water temperature in the area and remove the shade and cover that currently exist. The analysis for the designation of Critical Habitat notes that the quality of freshwater habitat is tied to the quality of riparian habitat because of the requirement of large woody debris, gravel, and water quality in remote reaches of rivers.

Dewatering/diverting water flows will require temporary fish exclusion to install the diversion, which could cause water to flow more rapidly in the biological study area and may decrease the quality of critical habitat in the area, as it is now more difficult for small juvenile fish to swim through the project area. ***Due to the location of this project in a Fire Hazard Severity Zones designated as Moderate by the California Department of Forestry and Fire Protection, there is a potential for fire to reach this site in upcoming seasons. Any plastic-material based diversion pipe in the diversion system could melt or burn in the event of a catastrophic fire. The melting or burning of the plastic diversion pipe could create impacts through toxins being released into the creek system or from the inability to properly remove all the melted material from the creek. The contractor will use fire-resistant materials for stream dewatering/diversion, when feasible.**

The project will not result in long-term effects to either Central California Coast Coho Salmon Critical Habitat or Central California Coast Steelhead Critical Habitat. ***Since the existing abutments at both bridges were constructed by casting materials directly into the exposed bedrock within the stream channel, the abutments will be partially removed in an effort to minimize removal of bedrock and alteration of the stream channel.

Abutments and side support columns at the San Lorenzo River Bridge will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. Future design plans are anticipated to provide greater detail on existing abutment removal.

At the Kings Creek Bridge, abutments will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. A portion of existing sacked concrete (0.049 acre), located approximately 10 feet above the Ordinary High Water Mark, along the existing northern abutment, will be replaced with rock slope protection. The existing pier located below the Ordinary High Water Mark will be removed to approximately 3 feet below original grade.** This will result in a net reduction of permanent man-made structures in the streambed by 0.0005 acre (22 square feet). The new bridge structure will have no piers in Kings Creek or its associated riparian zone. These design features will provide more open habitat for migrating coho salmon and steelhead. Standard water quality Best Management Practices from Section 7 (Non-Storm Water Management Best Management Practices) and Section 8 (Waste Management and Materials Pollution) of the Caltrans Construction Site Best Management Practices Manual and Caltrans Standard Specifications for pollution control identified in Section 2.2.2 (Water Quality and Storm Water Runoff) will also minimize temporary construction impacts to Central California Coast Coho Salmon Critical Habitat and Central California Coast Steelhead Critical Habitat.

***A copy of the Biological Opinion and Incidental Take Statement acquired by Caltrans for both species from the National Marine Fisheries Service through the federal Endangered Species Act Section 7 formal consultation process is included in Appendix G (Biological Opinion and Incidental Take Statement) of this document. The federal Endangered Species Act Section 7 finding determination is that the project May Affect and will Likely Adversely Affect designated Critical Habitats for Central California Coast coho salmon Evolutionary Significant Unit and the Central California Coast steelhead Distinct Population Segment. In the signed Biological Opinion, the National Marine Fisheries Service concluded that the project is not likely to jeopardize the continued existence of these species; nor is it likely to adversely modify critical habitat. However, the National Marine Fisheries Service expects that take of Central California Coast steelhead and Central California Coast coho salmon may occur. An Incidental Take Statement which applies to this project with non-discretionary terms and conditions was included with the signed Biological Opinion for this project. The National Marine Fisheries Service did not provide any conservation recommendations with the signed Biological Opinion and Incidental Take Statement.**

Central California Coast Coho Salmon Evolutionary Significant Unit and Central California Coast Steelhead Distinct Population Segment

Environmental consequences to the Central California Coast coho salmon Evolutionary Significant Unit and the Central California Coast steelhead Distinct Population Segment are discussed together because of the similar scope and degree of potential project impacts.

No pile driving or use of vibratory hammers are proposed for this project. As such, no hydroacoustic impacts to fish are expected.

A stream diversion will be required at both the San Lorenzo River and Kings Creek locations for up to three consecutive years. There will be no in-water work, including the dewatering and diversion plan implementation, between October 31 and May 30, when adult coho salmon and steelhead could be present. Juvenile fry and fingerlings will be present within the streams all year and could be impacted by the water diversion. During the dewatering, exclusions and relocations will be required if coho salmon or steelhead are present, which could create stress for the fish. Relocating animals out of their preferred habitat may make them expend more energy finding food and cover. The higher velocity flows within the pipe diversion could make it more difficult for small fry to swim or find shelter in the project area and biological study areas and push them further downstream. Additionally, once a diversion is in place, fine sediments may accumulate upstream of the diversion because of the limited capacity of the diversion.

As discussed in Section 2.2.2 (Water Quality) demolition and construction phases of the project will generate sediment, but if a cofferdam is constructed for the removal of pier foundations, the impact on fish species will be reduced. The appropriate best management practices will be deployed to control sediment transport into the stream channel resulting from abutment removal and installation. Degradation of water quality will be minimized through proper engineering controls. Oil, grease, and other pollutants, including metals and pesticides, are not expected to enter the waterways when proper best management practices are applied to construction activities. Standard water quality Best Management Practices from Section 7 (Non-Storm Water Management Best Management Practices) and Section 8 (Waste Management and Materials Pollution) of the Caltrans Construction Site Best Management Practices Manual and Caltrans Standard Specifications for pollution control and measures to avoid and minimize impacts to wetlands, and other waters will further reduce potential impacts to special status fish species in the project area (see Section 2.2.2 and Section 2.3.2).

To document effects to sensitive species like coho salmon, Caltrans will provide the National Marine Fisheries Service a written summary of work performed (including biological surveying and monitoring), Best Management Practices implemented (for example, use of biological monitors, flagging of project areas, erosion and sedimentation controls) and supporting photographs. Furthermore, the documentation describing listed species surveys and relocation efforts (if appropriate) will include the name(s) of the Caltrans-approved biologist(s), location and description of area surveyed, time and date of survey, all survey methods used, a list and tally of all sensitive animal species observed during the survey, a description of the instructions/recommendations given to the applicant during the project, and a detailed discussion of capture and relocation efforts, if appropriate.

The removal of vegetation for three consecutive years will reduce shade in the biological study areas and may inadvertently increase water temperature in the project footprint. The effects will be localized, and not so strong as to injure fish due to an increased temperature, but it may reduce the amount of shade and cover available for the species during construction. That may force the fish to expend more energy finding cover and shelter outside the project footprint.

There will be direct and indirect temporary negative impacts due to the implementation of a stream diversion/dewatering plan, fish relocation, and tree removal, but those will be minimized with the appropriate measures. ***-**

Ultimately, removing the existing piers in the riparian and stream habitat will be a net benefit to the species and will provide additional habitat for juveniles and adults. Since the project has the potential for take of Central California Coast coho salmon, an approved California Endangered Species Act Section 2081 Incidental Take Permit Statement from the California Department of Fish and Wildlife is required prior to construction.

***Caltrans has acquired a Biological Opinion and Incidental Take Statement for both species from the National Marine Fisheries Service through the federal Endangered Species Act Section 7 formal consultation process. The federal Endangered Species Act Section 7 finding determination is that the project May Affect and will Likely Adversely Affect the Central California Coast coho salmon Evolutionary Significant Unit and the Central California Coast steelhead Distinct Population Segment. In the signed Biological Opinion, the National Marine Fisheries Service concluded that the project is not likely to jeopardize the continued existence of these species; nor is it likely to adversely modify critical habitat. However, the National Marine Fisheries Service expects that take of Central California Coast steelhead and Central California Coast coho salmon may occur. An Incidental Take Statement which applies to this project with non-discretionary terms and conditions was included with the signed Biological Opinion for this project. Copies of both can be found in Appendix G (Biological Opinion and Incidental Take Statement) of this document.**

Marbled Murrelet

Although seasonally appropriate field surveys found suitable habitat present in the form of redwoods in the biological study areas that provide enough lichens and mosses to build nests, there was no sign of marbled murrelet. There are no known occurrences of marbled murrelet within four miles of the two bridge sites. It is unlikely that marbled murrelet will be within the biological study areas during vegetation removal or construction. There will be no take of the species. The federal Endangered Species Act finding determination is that the project will have No Effects to marbled murrelet; therefore, no further discussion of this species will occur in this document.

Avoidance, Minimization, and/or Mitigation Measures

Essential Fish Habitat

Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration are applicable to federally designated Central California Coast Coho Salmon Essential Fish Habitat. Also, avoidance and minimization measures identified for worker education programs, migration period, in-stream work, dewatering, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring proposed to protect Central California Coast Coho Salmon Critical Habitat are applicable to federally designated Central California Coast Coho Salmon Essential Fish Habitat. In addition, the following measure is proposed to further minimize temporary impacts to Essential Fish Habitat:

- **Vegetation Replacement CEQA Mitigation**—All cut banks, road fills, bare shoulders, disturbed streambanks, and other similar disturbed areas in the riparian zones will be revegetated after construction to prevent erosion. All sediment control and retention structures will be checked throughout the rainy season during construction and the plant establishment period.

Compensatory mitigation is not expected because the project will only temporarily impact Essential Fish Habitat and the compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to Essential Fish Habitat.

Central California Coast Coho Salmon Critical Habitat

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast Coho Salmon Critical Habitat, which are included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration apply to federally designated Critical Habitat for the Central California Coast Coho salmon. Furthermore, avoidance and minimization measures for vegetation replacement proposed to protect Central California Coast Coho Salmon Essential Fish Habitat will apply to federally designated Critical Habitat for the Central California Coast Coho salmon. In addition, the following measures are proposed to further minimize the impacts to Central California Coast Coho Salmon Critical Habitat:

- **Worker Education Program CEQA Mitigation**—Prior to vegetation removal, construction, and initiation of any stream diversion/dewatering

activity, a qualified biologist will conduct a worker environmental training programs for all workers on site. The worker education program will include a description of protected species and habitats, their legal/protected status, proximity to the project site, avoidance/minimization measures to be implemented during the project, and the implications of violating the federal Endangered Species Act and other relevant permit conditions.

- **Migration Period CEQA Mitigation**—To avoid impacts to Critical Habitat, all work will be completed outside of the anticipated migration period for threatened and endangered fish species, through coordination with National Marine Fisheries Service and the California Department of Fish and Wildlife Service.
- **In-stream Work CEQA Mitigation**—During construction, in-stream work will be limited to June 1 and October 31, during the period of seasonally lower water levels. Deviations from this work window will only be made with concurrence from the Department of Transportation biologist and regulatory resource agencies.
- **Dewatering CEQA Mitigation**—Dewatering/diversion will be performed according to Caltrans Construction Site Best Management Practices (2017), and upstream and downstream passage of adult and juvenile fish will be maintained at all times, according to current National Marine Fisheries Service guidelines and criteria (2001). ***The Contractor will use fire-resistant materials for stream dewatering/diversion, when feasible.**
- **In-Channel Structure Removal CEQA Mitigation**—Immediately upon completing in-channel work, the contractor will work with a qualified biologist to ensure that all in-channel structures will be removed in a manner that minimizes disturbance to downstream flows and water quality.
- **Site Restoration CEQA Mitigation**—After site construction activities are completed, the contractor will remove all temporary excavations and fills within the project limits in their entirety and return the affected areas to preconstruction elevations.
- **Biological Monitoring CEQA Mitigation**—A qualified biological monitor will monitor erosion and sediment controls to identify and correct any conditions that could adversely affect threatened or endangered species or their Critical Habitat. The biological monitor will be granted the authority to halt work activity as necessary and to recommend measures to avoid/minimize adverse effects to threatened or endangered species or their Critical Habitat.
- **Tree and Shrub Replacement CEQA Compensatory Mitigation**— All tree and shrub removal will be replaced after construction work is completed to replace riparian habitat as quickly as possible. Within the riparian zone, non-native trees that are removed will be replaced with

native trees at a minimum 1:1 ratio and native trees will be replaced at minimum a 3:1 ratio. This ratio may increase as required by regulatory agency permit conditions. A mitigation and monitoring plan will be used to ensure restoration of the disturbed riparian corridor will occur. Replacement plants, erosion control material, native seed mixtures, and an invasive weed treatment plan will be described in detail in in the mitigation and monitoring plan. The final mitigation and monitoring plan will be consistent with the agency requirements as written in the 404, 401, and 1602 permits and will be reviewed and approved through the regulatory review process.

No additional compensatory mitigation is expected because the project will only temporarily impact Central California Coast Coho Salmon Critical Habitat and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

Central California Coast Steelhead Critical Habitat

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast Steelhead Critical Habitat, which are included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration apply to federally designated Critical Habitat for the Central California Coast steelhead. Furthermore, avoidance and minimization measures for vegetation removal proposed to protect Central California Coast Coho Salmon Essential Fish Habitat apply to federally designated Critical Habitat for the Central California Coast steelhead. The Central California Coast Coho Salmon Critical Habitat avoidance and minimization measures which are proposed for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring will also be implemented to avoid and minimize potential adverse impacts to California Central Coast Steelhead Critical Habitat. The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to natural Central California Coast Steelhead Critical Habitat. No additional compensatory mitigation is expected because the project will only temporarily impact Central California Steelhead Critical Habitat areas and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

Central California Coast Coho Salmon Evolutionary Significant Unit

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast coho salmon, which are

included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration apply to Central California Coast coho salmon Evolutionary Significant Unit. Also, avoidance and minimization measures for vegetation replacement proposed to protect Central California Coast Coho Salmon Essential Fish Habitat apply to Central California Coast coho salmon Evolutionary Significant Unit. The Central California Coast Coho Salmon Critical Habitat avoidance and minimization measures which are proposed for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring will also be implemented to avoid and minimize potential adverse impacts to Central California Coast coho salmon Evolutionary Significant Unit. In addition, the following measures are proposed to further minimize the impacts to Central California Coast coho salmon Evolutionary Significant Unit.

- **Biological Monitoring and Fish Relocation CEQA Mitigation**—California Department of Transportation-approved biologist(s) with experience in coho salmon biology and ecology, aquatic habitats, biological monitoring (including diversion and dewatering), and capturing, handling, and relocating fish species will be retained for the project. During in-stream work, the biologist(s) will continuously monitor placement and removal of any required stream diversions to capture stranded steelhead and other native fish species and relocate them to suitable habitat as appropriate. The biologist(s) will capture coho salmon stranded as a result of diversion/dewatering and relocate coho salmon to suitable in-stream habitat outside of the work area, using methods approved by the appropriate regulatory agencies, which may include providing aerated water in buckets for transport and ensuring adequate water temperatures during transport. The biologist(s) will note the number of coho salmon observed in the affected area, the number relocated, and the date and time of the collection and relocation. The biologist(s) will monitor erosion and sediment controls to identify and correct any conditions that could adversely affect coho salmon or their habitat. The biologist(s) will be granted the authority to halt work activity as necessary and to recommend measures to avoid/minimize adverse effects to coho salmon and their habitat.
- **Dewatering Pumps CEQA Mitigation**—During in-stream work, if pumps are incorporated to assist in temporarily dewatering the site, intakes will be completely screened with no larger than 3/32-inch (2.38-millimeter) wire mesh to prevent coho salmon and other sensitive aquatic species from entering the pump system. Pumps will release the additional water to a settling basin or tan, allowing the suspended sediment to settle out prior to re-entering the stream(s) outside of the isolated area. The form and

function of all pumps used during the dewatering activities will be checked daily, to ensure a dry work environment and minimize adverse effects to aquatic species and habitats.

The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to Central California Coast coho salmon Evolutionary Significant Unit. No additional compensatory mitigation is expected because the project will only temporarily impact Central California Coast coho salmon Evolutionary Significant Unit and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

Central California Coast Steelhead Distinct Population Segment

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast steelhead, which are included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration apply Central California Coast steelhead Distinct Population Segment. Avoidance and minimization measures for vegetation replacement proposed to protect Central California Coast Coho Salmon Essential Fish Habitat apply Central California Coast steelhead Distinct Population Segment. The Central California Coast Coho Salmon Critical Habitat avoidance and minimization measures which are proposed for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring will also be implemented to avoid and minimize potential adverse impacts to Central California Coast steelhead Distinct Population Segment. Furthermore, avoidance and minimization measures identified for biological monitoring and fish relocation and for dewatering pumps apply to Central California Coast steelhead Distinct Population Segment.

The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to Central California Coast steelhead Distinct Population Segment. No additional compensatory mitigation is expected because the project will only temporarily impact Central California Coast steelhead Distinct Population Segment and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

2.3.5 Invasive Species

Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of

invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act analysis for a proposed project.

Affected Environment

The Natural Environment Study for the project, dated December 2020, was the main source used in preparation of this section. Executive Order 13112 defines invasive species as "…an alien (or non-native) species whose introduction does or is likely to cause economic or environmental harm or harm to human health." Twenty-eight invasive plant species identified by the online California Invasive Plant Council Database (2017) were observed within the biological study areas (refer to Table 2.7).

Environmental Consequences

Ground disturbance and other aspects of project construction (for example: erosion control or landscaping) could spread or introduce invasive species within the biological study area. Invasive plants make up a substantial portion of the biological study areas and are often the dominant species in their plant community. The proposed project has the potential to increase the number of invasive, terrestrial species in communities and areas that are not currently dominated by them. Table 2.8 provides a list of known invasive species in the biological study areas for this project.

Table 2.8 Invasive Species in the Biological Study Areas

Common Name	Scientific Name	California Invasive Plant Species Rating
French broom	*Genista monspessulana*	high
English ivy	*Hedera helix*	high
Himalayan blackberry	*Rubus armeniacus*	high
ripgut brome	*Bromus diandrus*	moderate
Periwinkle	*Vinca major*	moderate
hedge parsley	*Torilis arvensis*	moderate
Harding grass	*Phalaris aquatica*	moderate
Italian rye grass	*Festuca perennis*	moderate
velvet grass	*Holcus lanatus*	moderate
Italian thistle	*Carduus pycnocephalus*	moderate
wild oat	*Avena fatua*	moderate
Bermuda buttercup	*Oxalis pes-caprae*	moderate
hairy cat's ear	*Hypochaeris radicata*	moderate
annual dogtail	*Cynosurus echinatus*	moderate

silver wattle	*Acacia dealbata*	moderate
African asparagus fern	*Asparagus asparagoides*	moderate
blue gum eucalyptus	*Eucalyptus globulus*	limited
forget-me-not	*Myosotis latifolia*	limited
wild geranium	*Geranium dissectum*	limited
Holly	*Ilex aquifolium*	limited
curly dock	*Rumex crispus*	limited
milk thistle	*Silybum marianum*	limited
rattlesnake grass	*Briza maxima*	limited
English plantain	*Plantago lanceolate*	limited
herb Robert	*Geranium purpureum*	limited
soft cheese	*Bromus hordeaceus*	limited
slender false garlic	*Nothoscordum gracile*	watch

In compliance with the Executive Order 13112 on Invasive Species and guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will not use species listed as invasive. None of the species on the California list of invasive species is used by Caltrans for erosion control or landscaping. All equipment and materials will be inspected for the presence of invasive species and cleaned if necessary. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and minimization measures will be implemented for to limit the introduction and spread of invasive species within the project sites:

- **Invasive Plant Avoidance**—During construction, the California Department of Transportation will ensure that the spread or introduction of invasive exotic plant species will be avoided to the maximum extent possible.
- **Imported Fill**—If the use of imported fill material is necessary, the imported material will be obtained from a source that is known to be free of invasive plant species or the material will consist of purchased clean material, such as crushed aggregate, sorted rock, or similar.
- **Revegetation Plans CEQA Mitigation**—Project plans will avoid the use of plant species that the California Invasive Plant Council, California Department of Agriculture, California Department of Fish and Wildlife, or other resource organization considers to be invasive or potentially invasive.

2.4 Temporary Construction Impacts

This section of the document discusses temporary impacts from the project that will occur during project implementation but will stop by the end of

construction. These impacts will not be considered ongoing but will be limited in duration. Construction activities are detailed in Section 1.4.1 (Build Alternative—Replace Bridges).

2.4.1 Air Quality

Regulatory Setting

The Federal Clean Air Act, 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 United States Environmental Protection Agency and the California Air Resources Board, set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards. The National Ambient Air Quality Standards and state ambient air quality standards have been established for six criteria pollutants that have been linked to potential health concerns: carbon monoxide, nitrogen dioxide, ozone, particulate matter—which is broken down for regulatory purposes into particles of 10 micrometers or smaller 10) and particles of 2.5 micrometers and smaller, lead, and sulfur dioxide. In addition, state standards exist for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The National Ambient Air Quality Standards 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 (known as, 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 the National Environmental Policy Act. In addition to this environmental analysis, a parallel "Conformity" requirement under the Federal Clean Air Act also applies.

Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to the State Implementation Plan for attaining the National Ambient Air Quality Standards. "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 National Ambient Air Quality Standards, and only for the specific National Ambient Air Quality Standards that are or were violated. The U.S. Environmental Protection Agency regulations at 40 Code of Federal Regulations 93 govern the conformity process. Conformity

requirements do not apply in unclassifiable/attainment areas for National Ambient Air Quality Standards 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 National Ambient Air Quality Standards for carbon monoxide, nitrogen dioxide, ozone, particulate matter, and in some areas (although not in California), sulfur dioxide. California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except sulfur dioxide, and also has a nonattainment area for lead; however, lead is not currently required by the Federal Clean Air Act to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans and Federal Transportation Improvement Programs that include all transportation projects planned for a region over a period of at least 20 years (for the Regional Transportation Plan) and 4 years (for the Federal Transportation Improvement Program). The Regional Transportation Plan and Federal Transportation Improvement Program conformity uses travel demand and emission models to determine whether or not the implementation of those projects will conform to emission budgets or other tests at various analysis years showing that requirements of the Federal Clean Air Act and the State Implementation Plan are met. If the conformity analysis is successful, the Metropolitan Planning Organization, Federal Highway Administration, and Federal Transit Administration make the determinations that the Regional Transportation Plan and Federal Transportation Improvement Program are in conformity with the State Implementation Plan for achieving the goals of the Federal Clean Air Act. Otherwise, the projects in the Regional Transportation Plan and/or Federal Transportation Improvement Program 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 Regional Transportation Plan and Federal Transportation Improvement Program, 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 Regional Transportation Plan and Transportation Improvement Program; the project has a design concept and scope that has not changed significantly from those in the Regional Transportation Plans and Transportation Improvement Program; project analyses have used the latest planning assumptions and Environmental Protection Agency-approved emissions models; and in particulate matter areas, the project complies with any control measures in the State Implementation Plan. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in carbon monoxide and particulate matter nonattainment or maintenance areas to examine localized air quality impacts.

Affected Environment

The December 2020 Air Quality, Noise, and Green House Gas Memorandum prepared for the project forms the primary basis for this evaluation of air quality impacts. The proposed project is in the North Central Coast Air Basin. This basin consists of Monterey, Santa Cruz, and San Benito Counties. The Monterey Bay Unified Air Pollution Control District regulates air quality in the air basin. It fosters and support programs that reduce ozone precursor emissions, implement rules when necessary, and maintain robust permitting and enforcement programs. The North Central Coast Air Basin is considered in attainment for all federal ambient air quality standards and non-attainment transitional for state ambient air quality standards for ozone and non-attainment for airborne particulate less than 10 microns in diameter.

The Monterey Bay Unified Air Pollution Control District's *2012-2015 Air Quality Management Plan* identified that the air basin continues to make progress toward attaining the 8-hour ozone standard, but emissions transported into the air basin challenge achieving full attainment. The plan prioritized reduction of ozone precursor emissions from mobile sources as this is the primary contributor of emissions, especially for nitrogen oxides. Mobile sources consist of the numerous cars and trucks that travel the streets and highways of the North Central Coast Air Basin, as well as other mobile sources such as off-road agricultural and construction equipment, trains and aircraft.

Both bridge sites are within a mostly rural area with scattered habitable dwellings near the proposed project work areas. These dwellings are on properties designated for rural residential use under the Santa Cruz County General Plan and are zoned Single-Family Residential under the Santa Cruz County Code. These residences are considered sensitive receptors for air quality impacts.

Environmental Consequences

The replacement of the two existing bridges will not result in the emission of any long-term air pollutants. Based upon review of the federal guidelines, this project will qualify for an exemption from further air quality review because it consists of bridge reconstruction (with no additional travel lanes) which is considered exempt from federal conformity analysis. All air quality impacts associated with the project will be temporary and will result from demolition and construction activities.

Certain construction activities can be the source of temporary impacts on air quality. These potential impacts include dust-producing and odor-producing activities that occur during demolition, excavation and grading, construction, and paving. Standard provisions included for all Caltrans projects will address potential emissions generated by construction equipment, grading activities, and various construction materials.

Construction duration is estimated to take a combined 18 months ***of activity over a three-year period** and is expected to progress quickly once the construction contract is awarded. With almost every construction project, there will be a short-term temporary increase in air emissions and fugitive dust during the construction period. During construction, the project will generate temporary air pollutants. Exhaust from construction equipment contains hydrocarbons, oxides of nitrogen, carbon dioxide, suspended particulate matter, and odors.

The use of heavy equipment during project construction could generate fugitive dust that will cause temporary impacts to local air quality if large amounts of excavation, soil transport, and subsequent fill operations are necessary. It is known that earthwork will be required for the improvements associated with this project and will include abutment and foundation excavation, construction of several retaining walls, drainage infrastructure construction, and other miscellaneous activities. The roadway will utilize existing grade to the maximum extent practicable but will require some fill to smooth the transition back to existing highway grade at the conform points. Some dust generation will be expected from the earthwork component of this project. The effects of construction equipment on air quality can vary substantially from day to day, depending on the level of activity, the specific type of operation, and the prevailing weather conditions.

Caltrans Standard Specifications pertaining to dust control and dust palliative application are required for all construction contracts to effectively reduce and control impacts related to construction emissions. The provisions of Caltrans Standard Specification Section 10-5, Dust Control, and Section 14-9, Air Pollution Control, will require the contractor to comply with all required California Air Resources Board and Monterey Bay Unified Air Pollution Control District rules, ordinances, and regulations. The project-level Stormwater Pollution Prevention Plan will provide water pollution control measures that will cross-correlate with standard dust emission minimization measures, such as covering soil stockpiles, watering haul roads, watering excavation and grading areas, and so on. In accordance with Caltrans Standard Specification 14-11.13B(2),a Debris Containment and Collection Plan will be included in the project's special provisions, as approved by the resident engineer, to effectively capture and collect all demolition debris and waste materials, thereby preventing any material from entering the creek channel or migrating off site during windy conditions. All stockpiled construction debris will, at a minimum, be covered daily or be hauled off as soon as possible.

Equipment emissions can vary substantially from day-to-day depending on the level of activity, the specific type of operation and the prevailing weather conditions. Depending on the construction site location and proximity to sensitive receptors, a project that generates high levels of construction emissions, including diesel particulate matter, may require special attention

and mitigation. Due to the small scope of work and its location, this project presents minimal potential to subject surrounding sensitive receptors to inhalable construction emissions that would be considered significant.

Removing the existing bridge structures will require demolition activities that potentially could create nuisance dust near the actual work location but is not expected to be significant enough to impact the nearest residences. Lead paint on the rail systems or girders and or asbestos wrapped utility pipes may potentially be present. Both bridge decks may have been treated with methacrylate in the past to try and seal cracks. Any work that disturbs the existing paint system and/or demolition of the structures exposes workers to health hazards and produces debris containing heavy metals and toxic fumes when heated. Grime, waste, and debris already on the bridge before the start of work may also contain lead.

A "Debris Containment and Collection Plan" will be included in the project special provisions (approved by the project Resident Engineer) to effectively capture and collect all demolition debris and waste materials, preventing any material from entering the river channel or migrating offsite during windy conditions. All stockpiled construction debris will be covered or be off-hauled as soon as possible.

If after a waste characterization evaluation determines if lead paint or asbestos wrapped pipe is present, the project will implement "Work Area Monitoring" of the ambient air and soil in and around the work area to verify the effectiveness of any containment system if one is ultimately included in the engineers estimate.

The project will not reduce mobile source emissions in the air basin in accordance with the goals of the *2012-2015 Air Quality Management Plan*. However, air pollutant emissions will be temporary and minimal, and the project will comply with all required California Air Resources Board and Monterey Bay Unified Air Pollution Control District rules, ordinances, and regulations.

Avoidance, Minimization, and/or Mitigation Measures

Since effects to air quality will be temporary and minimal, no avoidance, minimization, or mitigation measures are required.

2.4.2 Hazardous Waste and Materials

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 as well as the investigation and mitigation of issues pertaining to waste releases, air and water quality, human health, and land use.

The primary federal laws primarily regulate hazardous wastes/materials are the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and the Resource Conservation and Recovery Act of 1976. The purpose of the Comprehensive Environmental Response, Compensation, and Liability Act, often referred to as "Superfund," is to identify and cleanup abandoned contaminated sites so that public health and welfare are not compromised. The Resource Conservation and Recovery Act 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
- Atomic Energy Act
- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the acts listed above, Executive Order 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 California Health and Safety Code and is authorized by the federal government to implement the Resource Conservation and Recovery Act in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning issues pertaining to hazardous waste. The Porter-Cologne Act restricts the disposal of wastes and requires cleanup for wastes that are below hazardous waste concentrations but capable of affecting ground and surface water quality. California regulations that address waste management issues as well as the 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 hazardous materials that may affect human health and the environment are encountered. Proper management and disposal are vital if hazardous materials are found, disturbed, or generated during project construction.

Affected Environment

This section discusses what could be affected by the proposed project in relation to hazardous wastes and materials. A Hazardous Waste Initial Site Assessment was completed for this project on November 12, 2020. This report served as the primary source used in preparation of this section. A field review was not conducted for this project since it was not necessary. There are no hazardous waste sites or businesses commonly associated with hazardous waste generation nearby that have a potential for effecting or will be affected by this type of project. The following is a discussion regarding typical hazardous waste issues that could be associated with this project.

Aerially Deposited Lead

Aerially deposited lead may be present in roadside soils within the project limits. Until the mid-1980s, gasoline and petroleum refiners added lead to reduce engine noise. As motor vehicles traveled the highways, tiny particles of lead were emitted in the exhaust and settled on the soils next to the freeways and roads. Over the years, lead built up in the soils alongside the highways and roads. This contaminated soil is referred to as aerially deposited lead soils.

Lead occurs naturally in soils, but because of the widespread use of leaded paint before the mid-1970s and leaded gasoline before the mid-1980s, and contamination from various industrial sources, roadside soils often have lead concentrations much greater than normal background levels. Lead doesn't biodegrade or disappear over time, but it remains in the soil for thousands of years. Serious human health risks are associated with lead poisoning. Aerially deposited lead may be an issue for the proposed project.

Asbestos Containing Materials and Lead Containing Paint

Naturally occurring asbestos will not be an issue since it does not occur in the project area. However, asbestos containing materials and lead containing paint may be present in the existing structure proposed for demolition and removal. These types of materials in certain concentrations are considered hazardous materials and must be handled and disposed of in accordance with regulations.

Treated Wood Waste

Treated wood was likely used in the posts for metal beam guardrails, thrie-beam barriers, piles, and roadside signs that are proposed for demolition and removal. Treated wood waste is wood that was used in ground or water contact applications that has been removed from service. This wood is typically treated with preserving chemicals that protect the wood from insect attack and fungal decay during its use. Examples include fence posts, sill plates, landscape timbers, pilings, guardrails, and decking. It contains hazardous chemicals that pose a risk to human health and the environment. Arsenic, chromium, copper, creosote, and pentachlorophenol are among the

chemicals added to preserve wood. These chemicals are known to be toxic or cause cancer. Harmful exposure to these chemicals may result from skin contact with treated wood waste, or from inhalation or ingestion of treated wood waste particles in sawdust and smoke. It is presumed to be a hazardous waste and must be managed in accordance with the Alternative Management Standards, which among other things permits disposal of presumed hazardous waste treated wood waste at specific non-hazardous waste landfills.

Yellow Traffic and Thermoplastic

Older yellow stripe and thermoplastic typically contains lead which can be considered a hazardous material in certain concentrations. Some of the proposed yellow stripe and thermoplastic proposed for removal may contain lead and will need to be managed differently depending on its age and the way it will be removed. However, some of the yellow traffic stripe in this segment of State Route 9 may be newer yellow stripe that does not contain lead.

Environmental Consequences

The project will involve demolition and soil disturbance and excavation activities which could result in the temporary release of hazardous materials and waste if not properly managed and disposed. As part of construction traffic management, rerouted bicycle and pedestrian traffic will be directed away from demolition and excavation activities. Therefore, the proposed project is not expected to result in exposure of bicyclists or pedestrians to hazardous materials.

Excavation and Aerially Deposited Lead Release

There is the likely presence of soils with elevated concentrations of lead because of aerially deposited lead on the state highway system right-of-way within the limits of the project. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed under the July 1, 2016, Aerially Deposited Lead Agreement between Caltrans and the California Department of Toxic Substances Control. This agreement allows such soils to be safely reused within the project limits if all requirements of the agreement are met. The project will involve soil disturbance and excavation, which have the potential to release aerially deposited lead contained in the soil. Soils from the shoulder at the bridge approaches that are disturbed for purposes of conforming to the new bridge or exported from the site, will be tested to determine aerially deposited lead concentrations for reuse or disposal. Per Caltrans requirement, the project contractors will prepare a project-specific Lead Compliance Plan to minimize worker exposure to lead-containing soil. The plan will include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of lead-containing soil.

Asbestos Disturbance and Exposure

Testing for asbestos containing materials in structures, expansion joints, asbestos piping, and railing gaskets will occur before demolition of the existing bridges. If asbestos containing material is found then contractors conducting demolition, renovation, or related activities will be notified of the presence of asbestos in their work areas (for example: provide the contractor[s] with a copy of the any asbestos containing materials reports and list of asbestos removed during subsequent activities). Personnel not trained for asbestos work will be prohibited from disturbing asbestos.

Contractors are responsible for informing landfills and recycling facilities of the contractor's intent to dispose of asbestos waste. Landfills and recycling facilities may require additional waste characterization. Contractors are responsible for segregating and characterizing waste streams prior to disposal.

Written notification to the Monterey Bay Unified Air Pollution Control District is required 10 working days prior to commencement of any demolition activity whether asbestos is present or not.

Lead Containing Paint, Yellow Traffic Stripe, and Thermoplastic Removal

Testing for lead containing paint proposed for removal will occur before demolition of the existing bridges or any roadway pavement.

All lead containing paint at the project site will be subject to the California Division of Occupational Safety and Health Administration lead standards during maintenance, renovation, and demolition activities. In accordance with Title 8, California Code of Regulations, Section 1532.1(p), written notification to the nearest California Division of Occupational Safety and Health Administration district office is required at least 24 hours prior to certain lead-related work. Compliance and training requirements regarding construction activities where workers may be exposed to lead are presented in Title 8, California Code of Regulations, Section 1532.1, subsections (e) and (l), respectively. The removal, transportation, placement, handling, and disposal of lead-containing paint must result in no visible dust.

Yellow stripe or thermoplastic proposed for removal will be managed differently depending on its age and the way it will be removed. The plans for any recent projects that placed yellow stripe on this portion of State Route 9 will be reviewed to verify that lead-free yellow stripe was used. If this can be verified, then standard measures will be included to require preparation of a lead compliance plan but will not require the stripe debris to be disposed of as a hazardous waste. If it cannot be determined if lead-free yellow stripe was used or if some of the alignment has older yellow paint that the lead content cannot be determined, then standard measures will be included to collect the residue and determine if it needs to be disposed of as a hazardous waste. If the stripe is going to be removed as part of a cold plane or grinding operation

where the stripe is being removed with the asphalt concrete, then standard measures will require the contractor(s) to prepare a project-specific Lead Compliance Plan to minimize worker exposure to lead containing paint. The plan will include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of lead containing paint.

Treated Wood Waste Demolition and Disposal

Proposed demolition activities will remove and dispose of treated wood waste. It is presumed that treated wood waste is a hazardous waste and must be managed in accordance with the Department of Toxic Substances Control's Alternative Management Standards, which will permit disposal of presumed hazardous treated wood waste at specific non-hazardous waste landfills. Proper management of treated wood waste will follow Caltrans standardized project measures through the inclusion of Caltrans Standard Special Provisions in the project contract that will require certain prescribed actions from the contractor(s). Treated wood waste is presumed to be a hazardous waste and must be managed in accordance with the Alternative Management Standards which among other things permits disposal of presumed hazardous waste treated wood waste at specific non-hazardous waste landfills. Since treated wood waste is presumed to be a hazardous waste, Caltrans is charged a Hazardous Waste Generator Fee by the State Board of Equalization.

Avoidance, Minimization, and/or Mitigation Measures

It is unlikely that the project will create significant environmental effects related to hazardous waste and materials. The project effects are routine construction issues that are handled in the construction contract through regulatory requirements and the inclusion of standard specifications and special provisions. Therefore, no avoidance, minimization, or mitigation measures are required.

2.4.3 Noise

Affected Environment

The December 2020 Air Quality, Noise, and Green House Gas Memorandum prepared for the project forms the primary basis for this evaluation of noise impacts. The project is situated in a primarily rural section of Santa Cruz County. There are scattered residences near the project limits at both locations.

Environmental Consequences

The project does not meet the required conditions to be considered a Type 1 project for noise according to Federal Highways Administration procedures. Since no capacity will be added to the highway and the vertical profile of the new bridges will be the same after construction, this is considered a Type 3

project, it is assumed that local noise levels will be the same after completion of the project as they were before. Although the project will involve widening of the horizontal profile of the bridge decks by 8 feet in each direction, the project will not involve realignment of lanes and will not bring vehicle movement closer to residences. Long-term noise abatement measures are not anticipated with this project.

Noise levels in the project vicinity will experience a short-term increase due to construction activities. The level of construction noise will vary, based on the construction activity type, the location of construction and the type of construction equipment used by the contractor. Pile driving is not anticipated for this project.

Adverse noise impacts from construction are not anticipated because construction will be temporary and intermittent, conducted in accordance with Caltrans Standard Specifications, and because local noise levels are significantly influenced by local traffic noise. Caltrans Standard Specifications (Section 14-8.02) requires the contractor to control and monitor noise resulting from work activities and not to exceed 86 dBA Lmax at 50 feet from the job site from 9:00 p.m. to 6:00 a.m.

The Caltrans Resident Engineer will ensure that whenever possible construction work will be done during the day, especially when work is near sensitive receptors. If nighttime construction activities are necessary, the noisiest construction activities will be done nearest the residences as early in the evening as possible.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and minimization measures will be implemented to minimize noise and vibration impacts during periods of construction:

Equipment Noise Control

- **Equipment Shielding**—The Contractor will shield especially loud pieces of stationary construction equipment.
- **Equipment Location**—The Contractor will locate portable generators, air compressors, etc., as far away from sensitive noise receptors as feasibly possible and limit grouping major pieces of equipment operating in one area to the greatest extent feasible.
- **Heavy Traffic Areas**—The Contractor will place heavily trafficked areas such as the maintenance yard, equipment, tool, and other construction-oriented operations in locations that will be the least disruptive to surrounding sensitive noise receptors.
- **Equipment Noise Abatement**—The Contractor will use newer equipment that is quieter and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as

mufflers, engine covers, and engine vibration isolators intact and operational. Internal combustion engines used for any purpose on or related to the job will be equipped with a muffler or baffle of a type recommended by the manufacturer.

- **Nighttime Construction**—The Resident Engineer will ensure that whenever possible construction work will be done during the day, especially when work is near sensitive receptors. If nighttime construction activities are necessary, the noisiest construction activities will be done nearest the residences as early in the evening as possible.

Administrative Measures

- **Public Notice**—The California Department of Transportation will notify surrounding residents and the public in advance of the construction schedule when construction noise and upcoming construction activities likely to produce an adverse noise environment are expected. This notice will be given two weeks in advance. Notice will be published in local news media of the dates and duration of proposed construction activity. The District 5 Public Information Office will post notice of the proposed construction and potential community impacts after receiving notice from the Resident Engineer.
- **Noise Complaints**—The Resident Engineer will consult with District 5 Noise staff to determine appropriate steps to alleviate noise-related concerns if complaints are received during the construction process.

2.4.4 Traffic and Transportation/Pedestrian and Bicycle Facilities

Affected Environment

The Draft Project Report (December 2020) prepared for the project is the primary source for the evaluation of project impacts on transportation. State Route 9 is a conventional highway connecting the Monterey Bay Area and the city of Santa Cruz to the San Lorenzo Valley and the Southern San Francisco Bay Area. It serves the communities of the San Lorenzo Valley as main streets. Within the project area, State Route 9 is a two-lane highway. Both bridges are located within the defined limits of the Boulder Creek Census Designated Place. The San Lorenzo River Bridge is closer to the town core of Boulder Creek. The area surrounding the Kings Creek Bridge is in the Redwood Grove neighborhood. The San Lorenzo River Bridge is less than 0.5 mile away from the commercial core of Boulder Creek. The core also contains community-based uses that draw people from the surrounding residential areas, including recreation facilities, meeting sites, and parks.

Seven residential properties take direct access from Route 9 within the project limits of the San Lorenzo Bridge site. Two are located off separate private driveways to the northwest of the bridge; four share a private driveway to the northeast; and one residential property takes access from a private driveway to southeast of the bridge. Within the project limits, a total of 42

residential properties are provided primary access by public local roads that connect directly to State Route 9 within the project limits of the San Lorenzo River Bridge site. Monaco Lane provides access to eight of these properties from a connection located 300 feet to the north of the bridge on the east side of the route, and Riverdale Boulevard provides access to 34 residential properties from a connection to Route 9 approximately 200 feet to the south on the bridge on the west side.

Within the Kings Creek Bridge project limits, three residential properties take direct access from Route 9 using a shared private driveway on the west side of the route at the end of the guardrail to the south of Kings Creek Bridge. A total of 51 residential properties near this site take primary access from local public roads that connect directly to Route 9 within the project limits. Old County Highway and Riverview Drive provide access to 32 of these properties using a shared connection to Route 9 approximately 200 feet to the north of the bridge on the east side of the route, and Primavera Road and Riverview Road provide primary access to the other 19 residential properties from a connection to Route 9 approximately 200 feet to the north of the bridge on the west side of the route.

Santa Cruz Metro is the public transit agency serving the project area. The San Lorenzo River Bridge is 0.06 mile (300 feet) from the closest Santa Cruz Metro bus stop. The Kings Creek Bridge is 0.1 mile (500 feet) from the closest Santa Cruz Metro bus stop.

No sidewalk exists along the approach roadways leading to both bridges. However, San Lorenzo River Bridge has a three-foot-and-three-inch-wide sidewalk on both sides. Kings Creek Bridge has a 4-foot-and-six-inch-wide sidewalk along the northbound side. There are no pedestrian ramps leading to the bridge sidewalks. The guardrails connecting to the front side of the sidewalks hinder pedestrian access to the bridge sidewalks.

State Route 9 is a bike accessible highway. The rural sections of this route provide intercommunity mobility to schools and community facilities by walking and biking. Bicyclists use the route for community mobility and recreational biking as a link between trails. The route provides access to recreational destinations such as the Santa Cruz Mountains and area parks.

Environmental Consequences

The project will replace existing bridges and improve multimodal access. It will not conflict with any program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. The existing sidewalks on both bridges will be removed and replaced with standard-width, 8-foot outside shoulders since no other sidewalk facilities are within the area. The widened shoulders will provide enough area for pedestrian and bicycle access.

Construction duration is estimated to take a combined 18 months ***of activity over a three-year period** and is expected to progress quickly once the construction contract is awarded. Due to staging of the proposed project, temporary detours will not be necessary as all traffic will remain on the existing alignment during new bridge construction. Temporary pedestrian walkways will be provided as needed during construction. The proposed 8-foot-wide shoulders on the bridges will provide safe passage for bicyclists and pedestrians crossing the bridges. Community input will be sought on maintaining pedestrian, bicycle, and transit bus stop access during project construction phase. In cooperation with Santa Cruz Metro, this project is proposing minor improvements to the existing bus stop along the southbound lane just north of the San Lorenzo River Bridge.

Caltrans traffic management and control will include typical actions and strategies implemented during project construction to maintain traffic access within the project area while keeping the traveling public separated from construction activities. These strategies will include reduction of travel lanes to allow for construction to occur and traffic to continue at the same time, reduction of speed limit to reduce potential for traffic incidents, and installation of construction warning signs to inform the public. The reduction of lanes and traffic control will be accomplished through a combined use of concrete k-rail barriers and traffic signals to control one-way traffic on the bridges. There will only be one 10-foot-wide lane open for traffic at a time.

Lane reduction is a practice that is commonly done by Caltrans for a variety of needs. Standard practice for one-way lane reduction is to limit the extent as much as possible to allow for vehicles to clearly see that all oncoming traffic has cleared once the light has turned green before continuing forward. The scope of lane reduction will vary with each phase of construction based on the ongoing activities and their needs. The staging and maneuvering of equipment and materials will require areas that are adequately separated from traffic. This will be accomplished by closing the lane immediately leading to and from the work area. For most of construction, lane closure will be located relatively close to the bridge site. The temporary staging of 125-foot-long steel beam girders to support the new decking, resurfacing of 150 feet of existing pavement, and replacement of guardrails will require the temporary extension of the length of lane closure for a few days until the activity is complete. Once the new bridge lane is ready to open to traffic then the lane closure will shift to the new work location on the other side.

The construction of temporary work platforms, utility relocation, deck demolition, debris removal, and girder placement will require intermittent full lane closures until the immediate construction need is met and alternating traffic flow can reopen. Full lane closures will be scheduled for late night hours or weekends and could last up to six hours. Work involving cranes, like utility relocation and girder placement, could also require full closure. Depending on the size of the crane, full closure of the entire route may be

required to transport the nearest available cranes to and from the project locations. Caltrans will coordinate with the California Highway Patrol, local emergency services, and transit providers to minimize interruption of services during full closures. More information on temporary construction impacts to emergency services are discussed in Section 2.4.2 (Emergency Services).

At the Kings Creek Bridge project site, for a few days during construction the lane closures will have to temporary extend past the shared private driveway that provides primary access to the three residential properties on the west side of the route at the end of the guardrail to the south. Access to and from the 51 residential properties on Old County Highway, Riverview Drive, Primavera Road, and Riverview Road will be impacted by delay resulting from traffic queuing for alternating one-way traffic flow. It is possible that lane closure will also temporarily extend to the intersection with these local roads. At the San Lorenzo River Bridge project site, for a few days during construction the lane closures will temporarily extend past the three private driveways that provide primary access to seven residential properties along the route. Access to and from the 42 residential properties on Monaco Lane, Riverdale Boulevard, and connecting local roads will be impacted by delay resulting from traffic queuing for alternating traffic. Some of these properties have mailboxes along the route that will potentially be blocked by traffic control measures.

The Caltrans Construction Manual notes that it is physically impossible to carry on a series of operations between an existing roadway and adjoining properties that have access to the roadway without temporarily disrupting the access. However, it requires, whether permanent or temporary, restoration of access as soon as possible without waiting for the work to be completed past all the adjacent access points. The Caltrans Construction Manual (2019, Section 3-702A) states that the contractor has a contractual obligation to provide for the convenience of the public and public traffic. Section 7-1.03, "Public Convenience," of the Standard Specifications requires that operations present the least possible obstruction and inconvenience to the public. The public consists of anyone passing through or affected by construction operations, including bicyclists, pedestrians, and residents, as well as vehicular traffic. The "least possible obstruction and inconvenience" will always depend on judgment. The contractor for the project will use good construction industry practice, comply with specifications, and not materially diminish the degree of convenience and free passage through the area that existed before construction.

Caltrans will coordinate traffic control measures along with signal timing and placement to provide access priority to local properties owners and residents in the project area. Also, Caltrans will coordinate with the local transit provider to temporary relocate bus stops as needed and to provide information in advance to allow for route rescheduling. Caltrans will work with the U.S. Post Office to temporarily relocate any mailboxes blocked by project activities.

Temporary construction impacts on traffic and transportation are expected to be minor as traffic access will be maintained within the project area.

Avoidance, Minimization, and/or Mitigation Measures

Since effects to traffic and transportation/pedestrian and bicycle facilities will be temporary and minimal, no avoidance, minimization, or mitigation measures are required.

2.4.5 Utilities/Emergency Services

Affected Environment

Utilities

The San Lorenzo Valley Water District is the water utility provider for the project area. The water district owns and operates an 8-inch water main along the State Route 9. The water main is suspended from the bridge decking.

The Pacific Gas and Electric Company (known as PG&E) owns and operates an aerial power line along the route. The aerial power line within the San Lorenzo River Bridge project area runs along the southbound lane outside shoulder. The aerial line crosses the road from the northbound lane shoulder to the southbound lane shoulder within the Kings Creek Bridge project area.

The AT&T Company owns and operates an aerial telephone cable along the route. The Comcast Corporation owns and operates aerial and underground fiber optic cables. Within the San Lorenzo Bridge project area, the aerial telephone and fiber optic line share poles in the northbound lane outside shoulder. These same aerial communication lines share poles along the southbound lane outside shoulder within the Kings Creek Bridge project area.

There is no public sewer service in the project area. Solid waste generated within the county is collected by private waste haulers for disposal at one of the local designated landfills.

Emergency Services

The Santa Cruz Sheriff Department provides police service for the project area. The nearest county sheriff substation to the project sites is in Boulder Creek 0.5 mile south of the San Lorenzo River Bridge.

The Boulder Creek Volunteer Fire Department provides public service and responds to vehicle accidents, medical aid requests, hazardous material incidents vehicle fires, wildland fires, and structure fires within the project area. The nearest fire station to the project site is 0.5 mile south of the San Lorenzo River Bridge.

CalFire also provides fire protection services in the remote project regions. The nearest CalFire station (Jamison Creek) is along County Road 236 which

is approximately 1.5 miles west of the Kings Creek Bridge and 2 miles northwest of the San Lorenzo River Bridge.

Environmental Consequences

Utilities

The proposed replacement of two existing bridges and minor enhancements to an existing bus stop will not require any utility usage. Caltrans will coordinate with utility operators to ensure that all utilities within the roadway right-of-way will be relocated before and during construction. No permanent or long-term effects to utilities will occur.

During each stage of construction utility relocation will be required to avoid conflict with construction operations. Caltrans has included funds to provide for the state share of utility relocation and will work closely with the utility providers to facilitate relocation. Once construction is complete, utilities will be relocated to the appropriate areas as needed in coordination with the utility providers and Caltrans.

Construction of the proposed project will generate a minimal amount of wastewater. The primary source of wastewater will be associated with sanitary waste generated by construction workers. Portable waste facilities will be provided for use by all workers, and sanitary waste generated from the use of these facilities will be disposed of by an approved contractor at an approved disposal site.

Because the proposed project will involve replacing an existing bridge, the amount of water required during construction and operation of the proposed project will not require new or expanded water entitlements.

The proposed project will require the use of a local landfill to dispose of demolition materials. The use of the local landfill will be temporary and occur only during construction. It is Caltrans policy to recycle materials whenever possible. The proposed project will be served by a landfill with enough capacity to serve its solid waste disposal needs during construction.

The project will not affect any public sewer lines or waste processing facilities within or near the project site.

Emergency Services

The project will replace the existing bridges with new bridges of similar superstructure design and provide minor enhancement to an existing bus stop at existing locations. The new bridges and enhanced bus stop will not alter planned routes for emergency responses or evacuations. Therefore, the proposed project will not permanently affect emergency service plans or activities in the region.

Temporary construction impacts on emergency services are anticipated to be minor as emergency services will still be allowed to access the project area during construction. The proposed project will coordinate and notify regional emergency service providers of construction-related activities to provide advance notice and to allow for planning. Emergency service providers will be notified of any project activities that may have the potential to restrict or prevent emergency service access within the project area. The project will include Caltrans Standard Specifications and Caltrans Standard Special Provisions pertaining to actions and strategies that will help maintain a safe environment for construction workers and the traveling public. Emergency access to all interconnecting roadways and routes within the project area will be maintained during construction.

Avoidance, Minimization, and/or Mitigation Measures

Utilities

The project will not permanently impact utilities. Temporary impacts on utilities are expected to be minor as utility facilities will be relocated out of the work area and quickly reconnected for continued service during construction. Since it is unlikely that utilities will be adversely affected, no measures are proposed.

Emergency Services

The project will not permanently impact emergency services. Temporary impacts on emergency services are expected to be minor as emergency services will still be allowed to access the project area during construction. Since adverse effects to emergency services will be minimal, no avoidance, minimization, or mitigation measures are required.

2.5 Cumulative Impacts

2.5.1 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 to resources in the project area may result from residential, commercial, industrial, and highway development as well as timber harvesting and mineral resource production. These land use activities can degrade habitat and species diversity through consequences such as the 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 any potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act 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 California Environmental Quality Act can be found in Section 15355 of the California Environmental Quality Act Guidelines. A definition of cumulative impacts under the National Environmental Policy Act can be found in 40 Code of Federal Regulations Section 1508.7.

Resources Considered in the Cumulative Impact Analysis

A cumulative impact analysis is required whenever an environment document is prepared. The purpose of a cumulative impact analysis is to analyze the potential incremental environmental impacts associated with a project in conjunction with past, present, and reasonably foreseeable future projects. Caltrans, in conjunction with the Federal Highway Administration and the Environmental Protection Agency, developed a guidance document entitled "Guidance for Preparers of Cumulative Impact Analysis," which was consulted. As specified in the guidance, if the project does not result in a direct or indirect effect on a resource, it would not contribute to a cumulative effect on that resource. This cumulative impact analysis includes resources that are substantially affected by the project and resources that are currently in poor or declining health, or that would be at risk even if project impacts would not be substantial.

Based on the guidance, the following the California Environmental Quality Act-identified resources were evaluated and will either not be significantly impacted by the proposed project or were determined not to be in poor or declining health. Therefore, these resources were not included in the cumulative impact analysis for this project.

- Aesthetics (see Section 2.1.2 and 3.2.1)
- Air Quality (see Sections 2.4.1 and 3.2.3)
- Animal Species (Sections 2.3.3 and 3.2.4)
- Coastal Zone (see Chapter 2 and Section 3.2.11)
- Community Character and Cohesion (see Chapter 2 and Section 3.2.11)
- Consistency with State, Regional, and Local Plans and Programs (see Sections 1.1 and 3.2.11 and Chapter 2)
- Cultural Resources (see Sections 2.1.3 and 3.2.5)
- Energy (see Chapter 2 and Section 3.2.6)

- Environmental Justice (see Chapter 2 and Sections 3.2.11 and 3.2.14)
- Existing and Future Land Uses (see Chapter 2 and Section 3.2.14)
- Farmland (see Chapter 2 and Section 3.2.2)
- Geology, Soils, Seismicity and Topography (see Sections 2.2.3 and 3.2.7)
- Growth (see Chapter 2 and Section 3.2.14)
- Hazard and Hazardous Waste and Materials (see Sections 2.2.2 and 3.2.9)
- Hydrology and Floodplain (see Sections 2.2.1, 3.2.7, and 3.2.10)
- Invasive Species (see Sections 2.3.5 and 3.2.4)
- Land Use and Planning (see Chapter 2 and Section 3.2.11)
- Mineral Resources (see Chapter 2 and Section 3.2.12)
- Natural Communities (see Sections 2.3.1 and 3.2.4)
- Noise and Vibration (see Chapter 2 and Sections 2.4.3 and 3.2.13)
- Paleontology (see Chapter 2 and Section 3.2.7)
- Parks and Recreation (see Chapter 2 and Section 3.2.16)
- Plant Species (see Chapter 2 and Section 3.2.4)
- Relocations and Real Property Acquisition (see Chapter 2 and Section 3.2.14)
- Section 4(f) (see Chapter 2)
- Traffic and Transportation/Pedestrian and Bicycle Facilities (see Sections 2.4.4 and 3.2.17)
- Tribal Cultural Resources (see Sections 2.1.3 and 3.2.18)
- Utilities/Emergency Services (see Sections 2.4.5 and 3.2.19)
- Timberlands (see Sections 2.1.1 and 3.2.2)
- Water Quality and Stormwater Impacts (see Section 2.2.2 and 3.2.10)
- Wild and Scenic Rivers (see Chapter 2)
- Wildfire (see Section 3.2.20 and 3.3.5)

Environmental review and analysis have identified resources that may be impacted by the project or are in poor health within the project area, even if the project's impacts are relatively minor. Caltrans guidance for the California Environmental Quality Act cumulative impact assessments includes defining a resource study area. A resource study area is the geographic area within which impacts on a resource are analyzed. The boundaries of resource study areas for cumulative impact analysis are often broader than the boundaries used for project-specific analysis.

Greenhouse Gas Emissions and Climate Change Resources

Cumulative impacts associated with greenhouse gas emissions and climate change are discussed in Section 3.3 (Climate Change) of this document.

San Lorenzo River Watershed

The resource study area identified for this cumulative impact analysis (see Appendix C) is the open water and streambanks of the San Lorenzo River Watershed, which include the San Lorenzo River and its tributaries. The river is 29 miles long, and the watershed drains 137 square miles. The resource study area has been heavily impacted by historic land use and timber production. Due to excessive sedimentation, the San Lorenzo River Watershed has been identified on the Central Coast Regional Water Quality Control Board 303(d) list for Total Maximum Daily Loads Priority Schedule of impaired waters. This resource was identified for inclusion in the cumulative impact analysis due to the project's impacts on this resource and its sensitive nature and poor health in relation to protected biological resources.

Historical Context

There has been an overall decline in the quality of the riparian streambanks and open waters in the resource study area due to historic development. Although not quantifiable, based on lack of available information, it is likely that far more riparian and stream habitats were historically present in the area. Starting in 1863 with construction of a gunpowder factory near Felton, the San Lorenzo River Watershed has been subject to stream diversions and dam construction for industrial operations. In 1875, the San Lorenzo Valley Flume and Transportation Company constructed a flume to transport milled logs downstream to the coast. First a mill north of Boulder Creek was built. From there, prefabricated sections of v-flume were constructed until the flume reached Felton. Because of a lack of tributaries south of Felton, the flume company decided to build a railroad for the final seven miles of the route to Santa Cruz. To ensure a steady supply of water, feeder flumes were installed up Feeder Creek, Kings Creek, Two Bar Creek, Bear Creek, Boulder Creek, Clear Creek, Love Creek, Newell Creek, and other tributaries. This flume allowed other mills to be constructed all along the flume's course, including the Peery Mill in Lorenzo, Boulder Mill south of Lorenzo, Pacific Mills in Ben Lomond, and smaller operations outside of Felton. With these additional lumber patrons, the flume began to strain. Despite being leaky and stressed with increased usage, low water supplies, and damage from annual storms, the flume served as the primary conduit of lumber between the upper San Lorenzo Valley and Felton for ten years until completion of the narrow-gauge railroad route to Boulder Creek in April 1885. Demolition of the flume along the train route was completed in short order. Almost no verifiable remnants of the flume survive today. Although rumors persist that dams which supported the feeder flumes still survive along Bear Creek and Boulder Creek.

Current Health and Trends

The gunpowder mill was closed in 1914, and the dam was demolished. But other industrial operations like lumber mills, lime kilns, flour mills, factories, tanneries, commercial fishing, dairies, agriculture, and wineries continued to operate in the watershed as they had since the 1850s. By the early 1970s, the San Lorenzo River Watershed was in a poor state, suffering from excessive sedimentation, pollution from septic systems, reduced stream flow, urban runoff, and loss of terrestrial habitat. Many of these problems were the result of rapid and poorly planned development in the region. Conservation efforts in 1973 prompted a change in river management. Extensive sampling combined with cutting-edge hydrological modelling helped scientists and managers better understand the function of the watershed.

In 1979, the Santa Cruz County Board of Supervisors adopted the San Lorenzo River Watershed Management Plan. That plan represented a joint effort by Santa Cruz County and the California Department of Fish and Wildlife, under the California Protected Waterways Program. The 1979 Plan was a comprehensive watershed management plan with detailed recommendations that addressed water supply, instream flows, groundwater recharge, erosion and sedimentation, flood hazard, water quality, fishery resources, aquatic habitat, biotic resources, recreation, scenic values, and historic resources. While the County was the primary agency for implementation, the 1979 Plan included recommendations for action by most of the 35 other federal, state, and local agencies whose actions affected the Watershed. The recommendations of this plan resulted in a 70 percent decrease in sedimentation, and significant reductions in contamination. Continued management by the Central Coast Regional Water Quality Control Board through permitting of activities in impaired waters has significantly reduced sedimentation and improved water quality in the Resource Study Area.

Based on the dramatic loss of riparian areas and open waters within the resource study area and with continuing pressures on the remaining resources, this resource is in a state of poor health. With the interest in these resources and the recent trend towards restoration, the trend for this resource is stable and may be starting to improve.

Central California Coast Coho Salmon Evolutionary Significant Unit and Critical Habitat and Essential Fish Habitat

The biological study area occurs within a federal designation of Central California Coast Coho Salmon Critical Habitat and Freshwater Essential Fish Habitat in the San Lorenzo River Watershed. Coho salmon spend the first half of their life cycle rearing and feeding in streams and small freshwater tributaries. Spawning habitat is small streams with stable gravel substrates. The remainder of their life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean. The Central California Coast coho salmon is

listed as Federal Endangered and California State Endangered. These resources were identified for inclusion in the cumulative impact analysis due to the project's potential impacts on these resources and their sensitive nature, limited dispersion, and protected status.

Within the range of the Central California Coast coho salmon Evolutionarily Significant Unit, the life cycle of the species has been broken down into five essential habitat types: juvenile summer and winter rearing areas, juvenile migration corridors, areas for growth and development to adulthood, adult migration corridors, and spawning areas. It is recognized in the Federal Register that juvenile summer and winter ranges and spawning areas are typically found in small headwater streams and side channels, while adult and juvenile migration corridors and areas for development into adulthood are typically found in tributaries as well as mainstem reaches and estuarine zones. Specifically, growth and development into adulthood, occurs in marine waters. The Federal Register goes on to specifically call out the following essential features for coho salmon Critical Habitat: substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions.

The resource study area identified for this cumulative impact analysis (see Appendix C) is the San Lorenzo River Watershed. The biological study area has a total of 0.054 acre (2,350 square feet) of coho salmon Critical Habitat and Freshwater Essential Fish Habitat that may be directly and indirectly affected by the proposed project. No estimate for Critical Habitat within the watershed is available. Based on consideration that the river is 29 miles long and the watershed drains 137 square miles, the project will impact only a small portion of the potentially available Critical Habitat area.

Historic Context

Over a hundred years ago, coho salmon may have ranged as far south as the Santa Ynez River, using accessible coastal streams from there northward. Observation of salmon species in the San Lorenzo River was first reported by surveyors in 1879. Starting in the mid-1800's, the Santa Cruz Mountains were subjected to intensive logging that employed practices that were undoubtedly extremely damaging to stream habitats. Logging in the San Lorenzo Valley was particularly intense.

Historically the San Lorenzo River flowed across a floodplain extending from Neary Lagoon to the eastern bluff. After severe flooding in downtown Santa Cruz during the winters of 1938, 1941, and 1955, the U.S. Army Corps of Engineers constructed a flood control project in 1957 that included construction of levees and straightening and dredging of the river channel. This created a channelized flood control channel for the lower 2.5 miles of the river below State Route 1, and ultimately disconnected the lower river from its historical floodplain. Each summer and fall a seasonal lagoon forms at the mouth of the river. This is typical of coastal watersheds in California in which

lagoons form due to decreasing freshwater inflow during summer and fall months. Wave action deposits sand to create a barrier beach that prevents the river from flowing into Monterey Bay. This was made worse by the construction of jetties for the Santa Cruz Harbor to the 2,800 feet to east in Woods Lagoon. This barrier beach and the alteration of the river's course affected historic migration patterns for coho salmon. Due to flooding and increased water levels in the lagoon, the barrier beach is eventually breached, and water rapidly empties from the lagoon flushing juvenile salmonids prematurely into marine waters.

By 1978 the San Lorenzo River Water shed had lost its native coho salmon runs due to the combined effects of the severe 1976-77 drought and the influence of a state planting program from the 1950's through the mid-1970's that introduced non-native coho stocks. Cumulative impacts to the San Lorenzo Watershed caused by logging and other industrial activities which have also contributed to the decline of coho salmon and their Critical Habitat and Essential Fish Habitat are further discussed under the Historical Context for the San Lorenzo River Watershed in Section 2.5.2.

While there is no single factor responsible for Central California Coast coho salmon decline, both human activities and natural events have degraded their Critical Habitat and Freshwater Essential Fish Habitat. Coho salmon need cold, clean freshwater streams to lay their eggs, along with side channels and floodplains where young fish can find food and hide from predators. Agriculture and logging practices have straightened rivers and streams, deforested the riverbanks, and continued to extract water for farming, watering lawns, and other uses. The water that remains can become too warm for young salmon. Climate change, droughts, and poor water quality all contribute to the struggle for this species to thrive.

By the late 1990s, coho salmon lived in only a few places and were on the verge of extinction. Data showed the species declining throughout its range, except in two places: the Russian River and Scott Creek. In these two areas, conservation hatchery programs have supported the species, and we have recently observed some increases in abundance. Scientists use a combination of genetic studies, conservation supplementation programs, tagging efforts and in-stream surveys to understand how the population changes over time. They then work with local leaders to carefully manage the population and ensure that their recovery can fuel a region-wide comeback.

Significant Critical Habitat and Freshwater Essential Fish Habitat restoration and protection actions at the federal, state, and local levels have been implemented to improve degraded habitat conditions and restore fish passage. While these efforts have been substantial and are expected to benefit the survival and productivity of the targeted populations, there is no evidence demonstrating that improvements in habitat conditions have led to improvements in population viability. The effectiveness of habitat restoration

actions and progress toward meeting the viability criteria is being monitored and evaluated with the aid of new reporting techniques. Generally, it takes one to five decades to demonstrate increases in viability.

Current Health and Trends

The information for this section has largely been drawn from the National Oceanic and Atmospheric Administration's *2016 5-Year Review: Summary & Evaluation of Central California Coast Coho Salmon* (National Marine Fisheries Service West Coast Region, April 2016. Available at: https://repository.library.noaa.gov/view/noaa/17797) and Technical Memorandum (NOAA-TM-NMFS-SWFSC-472) "Historical Occurrence of Coho Salmon (*Oncorhynchus kisutch*) in Streams of the Santa Cruz Mountain Region of California: Response to an Endangered Species Act Petition to Delist Coho Salmon South of San Francisco Bay" (National Marine Fisheries Service Southwest Fisheries Science Center, February 2011, Available at: https://www.fs.fed.us/psw/publications/harvey/psw_2011_harvey004_spence.pdf).

Coho salmon are listed as Federal Endangered and California State Endangered throughout the California Central Coast region and are gone from most watersheds south of San Francisco. The existing research indicates that all independent and dependent populations are well below recovery targets and, in some cases, exceed previously established high-risk thresholds. An area of concern is the downward trends in the amount of dependent populations. These trends suggest that dependent populations are less able to maintain connectivity or act as buffers against declines in neighboring independent populations, suggesting that the independent populations are becoming more isolated with time.

The status of coho salmon in the Santa Cruz Mountains, where virtually all observed salmon have been the result of hatchery operations, remains especially dire. Observations of multiple wild returning adults to the region have been reported to the National Oceanic and Atmospheric Administration since publication of the last five-year study by the agency. Tagged adult coho salmon were also detected swimming past monitoring stations maintained on the San Lorenzo River (Source: Coastal Watershed Council, "Coho Salmon: Rooting for a Comeback", by Katie Kobayashi. Available at: https://coastal-watershed.org/coho-salmon-rooting-comeback/). Given these return events and detections hope remains for species recovery in the area.

Although longer-term trends tend to be downward, data suggest that some populations reached their lowest levels around 2008-2009 and have rebounded slightly since then. Through extensive habitat restoration and monitoring efforts, scientists and managers remain hopeful that coho salmon will return to the Santa Cruz Mountains. The San Lorenzo River serves as a key site for the recovery of the coho salmon, along with nearby Soquel Creek and Aptos Creek. Each of these streams once provided ideal habitat for coho

salmon comprised of cold, deep pools with wooded habitat for cover. As such, restoration projects such as large woody-debris installations have been implemented across the region to support the re-colonization of coho salmon.

Although conservation efforts for coho salmon have reduced some threats for this Evolutionary Significant Unit, threats from surface water and groundwater extraction, poor water quality, timber harvest, agriculture, urbanization, and estuary and wetland loss remain. While historical threats, such as timber harvest and commercial exploitation, have lessened during the past few decades, other previously unidentified threats, often linked to climate change, have worsened, and will likely worsen further in the coming decades. Shifts in oceanographic dynamics, such as sea-surface temperatures, wind patterns, and coastal upwelling, can alter salmon migration patterns and decrease food availability, greatly impacting Central California Coast coho salmon survival in the marine environment. Likewise, shifting temperature and precipitation patterns throughout the western U.S. are expected to significantly alter riverine hydrologic patterns, with warmer winter temperatures leading to less snowpack storage, more intense runoff events, and lower stream flows during dry periods. Recent local and state regulatory efforts may help mitigate the impact of climate change on streamflow, with the state's Sustainable Groundwater Management Act perhaps the most promising. However, the two-decade timeframe for full implementation of the act suggests the expected benefits may not be rapidly forthcoming. Overall, California has been a leader in addressing climate change through innovative technology and regulation, but international solutions are likely necessary given the global nature and extent of the issue. In summary, the health of the Central California Coast coho salmon Evolutionary Significant Unit in the San Lorenzo Watershed is poor but showing slight improvement. However, the health of the species as a whole is likely to continue decline over time.

Central California Coast Steelhead Distinct Population Segment and Critical Habitat

The biological study area occurs within federally designated Central California Coast Steelhead Critical Habitat in the San Lorenzo River Watershed. Steelhead are an ocean-going form of rainbow trout native to Pacific Coast streams from Alaska south to northwestern Mexico. Like salmon, they spend most of their adult lives in the ocean but spawn and rear in freshwater streams and rivers. Their diverse life histories have allowed steelhead to adapt to changing environmental conditions for millennia, but they haven't been able to withstand habitat losses from water diversions, dams, and urban development. The Central California Coast steelhead Distinct Population is listed as Federal Threatened. This resource was identified for inclusion in the cumulative impact analysis due to the project's less than significant with mitigation incorporated impact on this resource and its sensitive nature, limited dispersion, and protected status.

Steelhead are born in freshwater streams, where they spend their first few years of life. They then emigrate to the ocean where most of their growth occurs. After spending between one to four growing seasons in the ocean, steelhead return to their native freshwater stream to spawn. Unlike Pacific salmon, steelhead do not necessarily die after spawning and are able to spawn more than once. The physical and biological features for Central California Coast steelhead Critical Habitat are: 1) freshwater spawning sites with water quality and quantity and substrate to support spawning, incubation and larval development; 2) freshwater rearing sites with water quality, floodplain connectivity, forage habitat and natural cover to support juvenile growth; 3) freshwater migration corridors free of obstructions; 4) estuarine areas for juvenile transition between fresh and salt water; 5) nearshore marine areas for growth and maturation; and 6) offshore marine areas for growth and maturation.

The resource study area identified for this cumulative impact analysis (see Appendix C) is the San Lorenzo River Watershed. The biological study area has a total of 0.054 acre (2,350 square feet) of steelhead Critical Habitat that may be directly and indirectly affected by the proposed project. No estimate for Critical Habitat within the watershed is available. Based on consideration that the river is 29 miles long and the watershed drains 137 square miles, the project will impact only a small portion of the potentially available Critical Habitat area.

Historical Context

Historical abundance estimates of Central California Coast steelhead are limited. During the early 1960s, the California Department of Fish and Wildlife estimated 94,000 Central California Coast steelhead spawned throughout their range, with most spawning occurring in the Russian River Watershed (count of 50,000) and San Lorenzo River Watersheds (count of 19,000). One historical record (1964) estimated a run size of 20,000 steelhead in the San Lorenzo River before 1965. Recent data for the Russian River Watershed and San Lorenzo River Watershed suggests that these basins had populations smaller than 15 percent of the size that they had 30 years previously. These two basins were thought to have originally contained the two largest steelhead populations.

Many West Coast steelhead stocks have declined substantially to a fraction of their historic numbers. There are several factors that contribute to these declines, including: overfishing, loss of freshwater and estuarine habitat, hydropower development, poor ocean conditions, and hatchery practices. These factors collectively led to the National Marine Fisheries Service's listing of 28 salmon and steelhead stocks in California, Idaho, Oregon, and Washington under the Federal Endangered Species Act. In the San Lorenzo River Watershed, the cumulative impacts to the watershed caused by logging and other industrial activities discussed under the Historical Context for the San Lorenzo River Watershed in Section 2.5.2 have also contributed to the

decline of steelhead and their Critical Habitat. The historic alteration of the San Lorenzo River and creation the San Lorenzo Lagoon for flood control purposes affected migration and development for steelhead. The sudden breaches of the lagoon prematurely flush juvenile steelhead out to marine waters, as discussed above for coho salmon.

Historically the San Lorenzo River flowed across a floodplain extending from Neary Lagoon to the eastern bluff. After severe flooding in downtown Santa Cruz during the winters of 1938, 1941, and 1955, the U.S. Army Corps of Engineers implemented a flood control project in 1957 that included construction of levees and straightening and dredging of the river channel. This created a flood control channel for the lower 2.5 miles of the river below State Route 1, and ultimately disconnected the lower river from its historical floodplain. Each summer and fall a seasonal lagoon forms at the mouth of the river. This is typical of coastal watersheds in California in which lagoons form due to decreasing freshwater inflow during summer and fall months. Wave action deposits sand to create a barrier beach that prevents the river from flowing into Monterey Bay. This was made worse by the construction of jetties for the Santa Cruz Harbor located 2,800 feet to the east in Woods Lagoon. Due to flooding and increased water levels in the lagoon, the barrier beach is eventually breached, and water rapidly empties from the lagoon flushing juvenile salmonids prematurely into marine waters.

Significant habitat restoration and protection actions at the federal, state, and local levels have been implemented to improve degraded habitat conditions and restore fish passage. While these efforts have been substantial and are expected to benefit the survival and productivity of the targeted populations, there is no evidence demonstrating that improvements in habitat conditions have led to improvements in population viability. The effectiveness of Critical Habitat restoration actions and progress toward meeting the viability criteria will be monitored and evaluated with the aid of new reporting techniques. Generally, it takes one to five decades to demonstrate such increases in viability.

Current Health and Trends

The information for this section has largely been drawn from the National Oceanic and Atmospheric Administration's *2016 5-Year Review: Summary & Evaluation of Central California Coast Steelhead* (National Marine Fisheries Service West Coast Region, April 2016. Available at: https://repository.library.noaa.gov/view/noaa/17017) and the *Updated Status of Federally Listed ESUs of West Coast Salmon and Steelhead*, (National Marine Fisheries Service West Coast Salmon Biological Review Team, July 2003. Available at: https://swfsc.noaa.gov/publications/FED/00684.pdf).

The Central California Coast steelhead Distinct Population Segment is listed as Federal Threatened. Steelhead populations in the Central California Coast are the most poorly monitored salmonid populations in the North-Central

California Coast Recovery Domain. Population-level estimates of adult abundance is entirely lacking for 28 populations that constitute the North Coastal, Interior, Coastal San Francisco Bay, and Interior San Francisco Bay diversity strata. Only in the Santa Cruz Mountain stratum has implementation of the Coastal Monitoring Plan been initiated, and here only recently. Thus, except for the life-cycle monitoring station in Scott Creek, estimates of abundance span only one to three years for populations in this stratum. More limited monitoring efforts have produced data for a few partial populations, but the lack of data continues to make it extraordinarily difficult to assess the status and trends of populations in the Distinct Population Segment.

The scarcity of information on steelhead abundance in the Central California Coast Distinct Population Segment continues to make it difficult to assess whether conditions have changed since it was concluded that the population was likely to become endangered in the foreseeable future. New information from three years of Coastal Monitoring Plan implementation in the Santa Cruz Mountain stratum indicates that population sizes are perhaps higher than previously thought. However, the downward trend in the Scott Creek population, which has the most robust estimates of abundance is a source of concern. While data availability for this species remains poor, there is little new evidence to suggest that the extinction risk has changed appreciably in either direction since the last status review. Therefore, the health of the Central California Coast steelhead Distinct Population Segment and their Critical Habitat is considered poor and in decline.

The collective risk to Central California Coast steelhead has not changed significantly since it was classified as Federal Threatened. Improvements have been made in small fish passage barriers, and numerous habitat restoration projects have improved Critical Habitat conditions. Conversely, Critical Habitat problems are still common throughout the region, legacy effects persist in many areas, new urban growth threatens existing habitat, and many more habitat improvements and protections are likely needed to achieve viability. Harvest rates remain relatively low and the protection afforded by some regulatory mechanisms, such as implementation of Total Maximum Daily Loads by the U.S. Environmental Protection Agency, has increased, although existing regulatory mechanisms could be improved to better protect steelhead in the San Lorenzo Watershed. Ongoing impacts from urbanization and diversion facilities (including small diversions as well as large dams) continue to impair Critical Habitat and limit species viability, and ongoing threats associated with urban expansion and illegal marijuana cultivation is expected to continue to adversely affect the Distinct Population Segment. These effects, as well as the impacts that climate change pose, remain a concern for long term conservation and recovery of the species.

2.5.2 Direct and Indirect Impacts of the Proposed Project that Might Contribute to a Cumulative Impact

San Lorenzo River Watershed

Temporary impacts to the watershed will occur from equipment staging areas, access roads, and work areas that are needed to construct the new bridge and remove the existing bridge. These impacts will involve tree and vegetation removal, grading, compaction by construction equipment, and foot traffic related to construction and utility work. All temporary work areas in the riparian zones will be returned to the original grade and contour and revegetated after construction. Estimated temporary impacts will total 0.277 acre (12,066 square feet) and will include areas in the San Lorenzo River that will be fully diverted and access roads through riparian areas to reach the river. At the Kings Creek Bridge project site, estimated temporary impacts will total 0.192 acre (8,364 square feet) and will include areas in Kings Creek that will be fully diverted and access roads through riparian areas to reach the creek.

The project will have impacts to Wetlands and Waters of the United States and State of California, as the bridge replacement will require working in and diverting the water of the San Lorenzo River and Kings Creek to allow for construction of the new bridges and demolition of the existing bridges. Impacts below the Ordinary High Water Mark of the San Lorenzo River will total 0.032 acre (1,395 square feet) and be temporary in nature. Impacts to the associated riparian zone along the San Lorenzo River will total 0.022 acre (960 square feet) and will also be temporary in nature. Temporary impacts below the Ordinary High Water Mark of Kings Creek will total 0.022 acre (960 square feet). Impacts to the associated riparian zone along the Kings Creek will total 0.015 acre (650 square feet) and will be temporary in nature.

In Kings Creek, there are currently two pier columns and foundations which will be removed, as the new bridge will fully span the creek without a pier. The pier will be removed and the riparian area where the pier columns and foundations currently exist will be restored to natural conditions. This area totals 0.0005 acre (22 square feet) of riparian and streambed habitat.

Prior to construction, Caltrans will prepare a Mitigation and Monitoring Plan to monitor avoidance and minimization efforts for impacts to wetlands and other waters. The plan will be consistent with federal and state regulatory requirements and will be amended with any regulatory permit conditions, as required. Caltrans will implement the Mitigation and Monitoring Plan as necessary during construction and immediately following project completion.

Central California Coast Coho Salmon Evolutionary Significant Unit and Critical Habitat and Freshwater Essential Fish Habitat

The proposed project has the potential to result in take of Central California Coast coho salmon during stream diversion and dewatering efforts. This section provides a summary of possible impacts on coho salmon during construction and demolition activities in the San Lorenzo River and Kings Creek.

Stream diversion and dewatering has the potential to result in water quality impacts through the release of sediments, including an increase in turbidity, reduction in dissolved oxygen, and release of pollutants. Increases in turbidity and reductions in dissolved oxygen are expected to be temporary, occurring mainly when the stream diversion is being installed and removed. Therefore, Caltrans has made the determination that a potential release of pollutants will not be a significant concern. Caltrans hydraulics engineers evaluated fish passage conditions for the existing bridges and for the proposed bridges and determined that both are favorable for the passage of adult and juvenile salmonids.

The boundary for Critical Habitat and Freshwater Essential Fish Habitat for coho salmon is the Ordinary High Water Mark, as delineated for Section 2.3.2 (Wetlands and Other Waters), therefore the impacts to this habitat is the same as that for the Ordinary High Water Mark, in the San Lorenzo River Watershed discussion above. The proposed project will cause a total of 0.054 acre (2,350 square feet) of temporary impacts to Central California Coast Coho Salmon Critical Habitat and Freshwater Essential Fish Habitat: 0.032 acre at the San Lorenzo River and 0.022 acre at Kings Creek. The Kings Creek Bridge replacement will result in a net reduction of permanent human-made structures in Critical Habitat areas by 0.0005 acre (22 square feet).

Implementation of the project will result in temporary impacts on open-water habitat, resulting primarily from dewatering the project work areas during pier removal and construction. Equipment access to the stream channel, construction of the new bridges, and demolition of the existing bridges will be performed in the dewatered portion of the stream; debris from bridge demolition will be separated from the stream by a temporary platform. The temporary impacts may result in the loss of service of coho salmon Critical Habitat for an estimated five months (June to October) per year during the staged three-year in-stream construction and demolition periods. However, the magnitude of these adverse effects will be minimized through implementation of avoidance and minimization efforts. Coho salmon passage along the San Lorenzo River and Kings Creek through the project area will still be unconstrained on the wetted side of the temporary sheet pile cofferdam. More detail regarding construction and demolition activities and proposed work schedules is provided in Section 1.4.1 (Build Alternative).

Central California Coast Steelhead Distinct Population Segment and Critical Habitat

The proposed project has the potential to result in take of Central California Coast steelhead Distinct Population Segment during stream diversion and dewatering efforts. This section provides a summary of possible impacts on steelhead during construction and demolition activities in the San Lorenzo River and Kings Creek.

Stream diversion and dewatering has the potential to result in water quality impacts through the release of sediments, including an increase in turbidity, reduction in dissolved oxygen, and release of pollutants. Increases in turbidity and reductions in dissolved oxygen are expected to be temporary, occurring mainly when the stream diversion is being installed and removed. Therefore, Caltrans has made the determination that a potential release of pollutants will not be a significant concern. Caltrans hydraulics engineers evaluated fish passage conditions for the existing bridges and for the proposed bridges and determined that both are favorable for the passage of adult and juvenile trout.

The boundary for Critical Habitat for steelhead is the Ordinary High Water Mark, as delineated for Section 2.3.2 (Wetlands and Other Waters), therefore the impacts to this habitat is the same as that for the Ordinary High Water Mark, in the previous San Lorenzo River Watershed discussion. The proposed project will cause a total of 0.054 acre (2,350 square feet) of temporary impacts to Central California Coast Steelhead Critical Habitat, 0.032 acre at the San Lorenzo River and 0.022 acre at Kings Creek. The Kings Creek Bridge replacement will result in a net reduction of permanent man-made structures in Critical Habitat area by 0.0005 acre (22 square feet).

Implementation of the project will result in temporary impacts on open-water habitat, resulting primarily from dewatering the project work areas during pier removal and construction. Equipment access to the stream channel, construction of the new bridges, and demolition of the existing bridges will be performed in the dewatered portion of the stream; debris from bridge demolition will be separated from the stream by a temporary platform. The temporary impacts may result in the loss of service of steelhead Critical Habitat for an estimated five months (June to October) per year during the staged three-year in-stream construction and demolition periods. However, the magnitude of these adverse effects will be minimized through implementation of avoidance and minimization efforts. Steelhead passage along the San Lorenzo River and Kings Creek through the project area will still be unconstrained on the wetted side of the temporary sheet pile cofferdam. More detail regarding construction and demolition activities and proposed work schedules is provided is Section 1.4.1 (Build Alternative) of this document.

2.5.3 Other Current or Reasonably Foreseeable Projects to Consider

The California Environmental Quality Act defines a project as an activity which may result in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and which is any of the following:

- An activity directly undertaken by any public agency.
- An activity undertaken by a person which is supported, in whole or in part, through contracts, grants, subsidies, loans, or other forms of assistance from one or more public agencies.
- An activity that involves the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies.

Ministerial projects are exempt from the requirements of the California Environmental Quality Act. The determination of what is "ministerial" can most appropriately be made by the particular public agency involved based upon its analysis of its own laws, and each public agency makes such determination either as a part of its implementing regulations or on a case-by-case basis.

This section contains a discussion of projects that are reasonably foreseeable or have recently been completed and have potential impacts to the identified cumulatively affected resources. Most are bridge and roadway repair and erosion control projects, and the remaining projects are mostly drainage repair and flood control improvements. The projects discussed are a mix of Caltrans-sponsored and locally-sponsored actions. These projects were selected based upon their potential direct and indirect cumulative impacts to the San Lorenzo Watershed and Critical Habitat areas for coho salmon and steelhead species and were identified from the following sources:

- Caltrans Project Portal, *State Highway Operation & Protection Program Ten-Year Project Book Fiscal Years 2019/20—2028/29*. Available at: https://dot.ca.gov/programs/asset-management/caltrans-project-portal
- County of Santa Cruz, Department of Public Works Project Portal and the *County of Santa Cruz 2020/2021 Capital Improvement Plan*. Available at: http://dpw.co.santa-cruz.ca.us/Home/Projects.aspx
- County of Santa Cruz, Planning Department Active Planning Applications and Status. Available at: https://www.cityofsantacruz.com/government/city-departments/planning-and-community-development/active-planning-applications-and-status
- City of Santa Cruz, Department of Planning and Community Development Active Applications and Development Projects. Available at: https://www.cityofsantacruz.com/government/city-departments/planning-and-community-development/development-projects

- City of Santa Cruz, Department of Public Works Current and Recent Projects. Available at: https://www.cityofsantacruz.com/government/city-departments/public-works/traffic-engineering/current-and-recent-projects
- City of Scotts Valley, Active Citywide Development Projects. Available at: https://www.scottsvalley.org/340/Active-Citywide-Projects
- City of Scotts Valley, *Funding Year 2018/19 Annual Budget and Five-Year Financial Plan*. Available at: http://scottsvalley.org/DocumentCenter/View/1250/FY-2018-19-Preliminary-Budget

Caltrans Projects

There are 17 planned and recently constructed Caltrans highway improvement projects on State Route 9 and State Route 17 within the Resource Study area. They range from pavement improvement projects, such as shoulder widening and safety projects, to erosion repair and drainage maintenance. Caltrans Standard Specifications and Best Management Practices will be included for all of these projects. Due to their nature and scope, it is unlikely that they would have direct or indirect impacts on the San Lorenzo Watershed or protected fish species and their designated Critical Habitat and Essential Fish Habitat.

County of Santa Cruz Projects

The County of Santa Cruz has identified 11 planned bridge replacement projects within the Resource Study Area (San Lorenzo River Watershed). One is proposed for construction in 2021, and the others would not be constructed until 2023 or later (refer to Table 2.8). These bridges are proposed for replacement for variety of often overlapping concerns including storm damage, foundation scour, structural instability, and poor design. Most of these bridges were constructed over 75 years ago and have outlived their design life. They would be replaced with modern two-lane, single-span bridge designs that would, where possible, remove or reduce the footprint of human-made structures in the open water and along the shorelines and thus increase available Critical Habitat and Essential Fish Habitat areas. Temporary access areas and temporary dewatering and stream diversion may be required to access and remove bridge abutments and piers. Permits from regulatory agencies would be required to perform in-stream work and sedimentation control. Avoidance and minimization measures for water quality, flood and erosion control, debris removal, and biological resources protections would likely be implemented for these projects. However, temporary impacts to Central California Coast coho salmon and steelhead and their designated Critical Habitats and Essential Fish Habitat would likely occur from these actions. Permanent impacts would likely result from widening of the bridges to where additional lanes are proposed. These bridges would also include new or redesigned storm water drainage features that would be subject to Best Management Practices to protect water quality. In one case fish passage issues would be addressed through a new bridge design. Critical Habitat

areas would be increased from projects that remove abutment and pier foundations from the streams. In-stream work would require permit approval and would be limited to the low water flow season when fish migration is unlikely.

A streambank stabilization project and a bridge foundation scour repair project are also proposed in the Resource Study Area. Both projects would include efforts to limit erosion which would result in temporary and permanent impacts within the streambed. Like the bridge replacement projects, they would include regulatory permit conditions, Best Management Practices, and seasonally limited in-stream work. Where possible, streambed and foundation protection would likely use natural materials as encouraged by regulatory agencies with jurisdiction over the project.

Table 2.8 Santa Cruz County Bridge Replacement and Erosion Projects

Project Name	Description & Background	Estimated Completion Year—Status
Branciforte Drive Storm Drainage Repair	Repair road slipout. The project will construct a steel beam pile wall with a timber lagging retaining wall requiring earth excavation and backfill, drainage facilities, asphalt pavement replacement, metal beam guard railing, asphalt dike, erosion control, and revegetation.	2021—Construction
Brimblecom Road at San Lorenzo River Bridge Replacement	Replace the 105-foot-long single-lane, steel treadway bridge north of the Town of Boulder Creek. The new bridge will be a two-lane, single-span post-tensioned concrete box girder bridge with improved roadway approaches.	2025—Preliminary Design
Conference Drive at Zayante Creek Bridge Scour Mitigation	Repair scour that has developed under an existing pier footing on the Conference Drive Bridge at Zayante Creek. Construction will consist of building a concrete cutoff wall in the front of the existing footing and repairing the scoured area.	2022—Environmental Review and Design
Either Way at San Lorenzo River Bridge Replacement	Replace the 59-foot-long Either Way Bridge over the San Lorenzo River, north of Boulder Creek. The narrow, load-limited, single-lane bridge will be completely replaced with a new two-lane bridge to meet current standards	2025—Environmental Review
Fern Drive at San Lorenzo River Bridge Replacement	Replace the 72-foot-long Fern Drive Bridge over the San Lorenzo River near Boulder Creek. The narrow single-lane bridge will be replaced with a two-lane single-span concrete box girder bridge to meet current standards and improved roadway approaches.	2023—Environmental Review and Design
Forest Hill Drive at Bear Creek Bridge Replacement	Replace the 70-foot-long Forest Hill Drive Bridge over Bear Creek northeast of the Town of Boulder Creek. The new bridge will be a two-lane single-span	2023—Environmental

Project Name	Description & Background	Estimated Completion Year—Status
	concrete slab bridge to meet current design standards.	Review and Design
Larkspur Street at San Lorenzo River Bridge Replacement	Replace the Larkspur Street Bridge over the San Lorenzo River in the Town of Brookdale. The existing narrow one-lane structure and roadway approaches will be completely replaced with a two-lane bridge and standard bridge approaches.	2023—Environmental Review and Design
Lompico Road at Lompico Creek Bridge Replacement	Replace the 21-foot-long Lompico Road Bridge over Lompico Creek at Creekwood Drive, north of the Town of Felton. The new bridge will be a single-span, concrete slab bridge to meet current standards and improve fish passage.	2023—Environmental Review and Design
Pleasant Way at San Lorenzo River Bridge Replacement	Replace the 57-foot-long single-lane, steel pontoon bridge north of the Town of Boulder Creek. The new bridge will be a two-lane, single-span post-tensioned concrete box girder bridge with improved roadway approaches.	2025—Preliminary Design
Quail Hollow Road at Zayante Creek Bridge Replacement	Replace the 84-foot-long Quail Hollow Road Bridge over Zayante Creek, northeast of the Town of Felton. The new bridge will be a two-lane, single-span concrete box girder with improved roadway approaches.	2023—Utilities Coordination
Ranch Rio Avenue at Newell Creek Bridge Replacement	Replace the 38-foot-long Rancho Rio Avenue Bridge over Newell Creek in Ben Lomond. The existing, narrow one-lane bridge will be completely replaced with a two-lane bridge and improved roadway approaches.	2023—Environmental Review and Design
San Lorenzo Way at San Lorenzo River Bridge Replacement	Replace the San Lorenzo Way Bridge, over San Lorenzo River in Felton. The existing one-lane structure and roadway approaches will be replaced with a two-lane clear span concrete box girder bridge and standard bridge approaches.	2021—Final Design
Two Bar Road at Two Bar Creek Bridge Rehabilitation	Rehabilitate and widen the 31-foot-long single-lane, steel treadway bridge north of the Town of Boulder Creek. The rehabilitated bridge will be a two-lane, single-span bridge with improved roadway approaches.	2025—Preliminary Design

In addition to the bridge replacement and erosion reduction work, the County has 48 storm damage repair projects within the Resource Study Area. According to the *County of Santa Cruz 2020/2021 Capital Improvement Plan* intense flooding caused a significant amount of roadway damage to mountain areas in 2011, 2016, and 2017. As a result of these flood events, 231 Emergency Proclamations were approved in total throughout the county by the Federal Highway Administration, the Federal Emergency Management Agency, and the California Office of Emergency Services. Of these, 51 have

been identified to be within the Resource Study Area, to which 11 have either completed construction or are currently in construction (refer to Table 2.9). Those in design and proposed to start construction next year total 28; and 12 more are planned between 2021 and 2024. These projects would mostly perform road repair and embankment stabilization, which often includes excavation and backfill, retaining walls, asphalt pavement and dike construction, erosion control and rock slope protection, drainage facility reconstruction, and revegetation. These storm damage repair projects will include agency permit conditions, Best Management Practices, standard construction practices, and environmental Avoidance, Minimization, and Mitigation Measures, as needed.

Table 2.9 County of Santa Cruz Storm Damage Projects in the Resource Study Area (*2020/2021 Capital Improvement Plan*)

Current Phase	2011	2016	2017	Total
Completed	4	2	15	21
Construction	0	1	1	2
Design	1	8	18	27
Future	0	0	1	1
Total by Year	5	11	35	51

City of Santa Cruz Projects

The City of Santa Cruz, in partnership with regulatory agencies, proposes the San Lorenzo River Culvert Project (formally known as the San Lorenzo River Lagoon Interim Management Program). This project would:

- Prevent excessive unnatural flooding of lower Ocean and Beach Flat neighborhoods caused by a closed lagoon.
- Reduce or eliminate catastrophic breaches of the lagoon which impacts protected fish species.
- Mitigate or eliminate the life-safety danger posed by lagoon breaches which can sweep beachgoers into life-threatening swift waters.

This would be accomplished through the installation of a water level control structure in the San Lorenzo River Lagoon to prevent unauthorized breaching of the river mouth and provide flood protection. The proposed water control system would protect the lagoon's water levels. Without this project, when the lagoon reaches high water levels and breaches during spring and summer months, the rapid dewatering of the lagoon is extremely harmful to juvenile

coho salmon and steelhead since it can prematurely flush these species to the ocean.

The project would require interim measures like the construction of a temporary outlet channel while a head driven culvert is constructed. The purpose of the temporary outlet channel is to provide a controlled drawdown of the lagoon elevation and then be closed. The Temporary Outlet Channel will be constructed up to six times during the season as needed to achieve the above flood control water level. The work would take place on one day for each channel that may be installed in a season.

The purpose of the head driven culvert is to allow the lagoon elevation levels under normal river mouth closure conditions and then maintain that elevation through passive removal of water from the lagoon via overflow of surface waters through a small weir and infiltration through the barrier sandbar as an additional contribution. A series of three 4-foot diameter standpipes (risers) would be partially buried in the lagoon adjacent to San Lorenzo Point and would be connected to a 450-foot horizontal culvert buried in the beach connecting the lagoon to the ocean. Lagoon water would seep into the porous bottoms of the risers, feeding flows into the horizontal culvert. Outflows through the culvert would be elevation driven by the head difference between the closed lagoon and the ocean.

Installation would require excavation of an estimated 700 linear feet of the channel bed at a depth of two to three feet at the east end of the Main Beach, and the culvert will be constructed in 100-foot-long segments with backfill between each segment. An estimated 500 cubic yards of material will be excavated and refilled to bury the pipe within an approximate area of 0.026 acres. It is anticipated that the culvert could be constructed in less than two weeks. The temporary outlet channel may affect but is not likely to adversely affect juvenile coho salmon or steelhead migration and would not result in significant impacts. The head driven culvert would affect steelhead smolt migration if installation would cause earlier closure of the lagoon than would be the case otherwise. This project would include agency permit conditions, Best Management Practices, standard construction practices, and environmental Avoidance, Minimization, and Mitigation Measures. Measures restricting closure of temporary outlet channel are included to avoid impacts to protected fish species during migration. The project would ultimately result in improved conditions for protected fish species and their designated Critical Habitat through the reduction or elimination of future catastrophic breaches.

2.5.4 Cumulative Impacts Conclusion

San Lorenzo River Watershed

The recently constructed and future identified projects with potential cumulative effects on the San Lorenzo River Watershed are mostly road and drainage improvement projects involving repair and replacement of roadways,

bridges/viaducts, culverts, scour mitigation, and retaining walls, all undertaken by public agencies. Due to the varied scheduling of environmental analysis, information regarding individual project impacts is limited at best. Therefore, a quantifiable and reliable model for evaluation is not feasible. Based upon the types of improvement projects listed, it can be assumed that the work would all be locally specific and disperse with short construction durations resulting in mostly temporary impacts from sedimentation and work in and near the waterways.

Projects that would potentially release pollutants or sediments into the San Lorenzo River Watershed are subject to regulatory permit approval and regulation by the Central California Coast Regional Water Quality Control Board since the San Lorenzo River Watershed has been identified on the Central Coast Regional Water Quality Control Board 303(d) list for Total Maximum Daily Loads Priority Schedule of impaired waters. Kings Creek is a tributary to the San Lorenzo River and follows the same guidelines for purposes of water quality. Under the U.S. Clean Water Act, Total Maximum Daily Loads is a regulatory plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

Some of these improvement projects would ultimately reduce the sedimentation in the San Lorenzo River and help meet Total Maximum Daily Limit requirements, which would be a net benefit to the watershed. It is anticipated that all potential significant effects of these projects would be mitigated, if necessary, through individual project measures and permit approval conditions. Based on this evaluation, it is unlikely that significant cumulative impacts on riparian areas and the open water of the San Lorenzo River Watershed will occur.

Central California Coast Coho Salmon Evolutionary Significant Unit and Critical Habitat and Freshwater Essential Fish Habitat

The recently constructed, current, and reasonably future identified projects with potential cumulative effects on the Central California Coast coho salmon Evolutionary Significant Unit and designated Central California Coast Coho Salmon Critical Habitat and Freshwater Essential Fish Habitat in the San Lorenzo River Watershed are mostly road and drainage improvement projects involving repair and replacement of roadways, bridges/viaducts, culverts, scour mitigation, and retaining walls, all undertaken by public agencies. Due to the varied scheduling of environmental analysis, information regarding individual project impacts is limited at best. Therefore, a quantifiable and reliable model for evaluation is not feasible. Based upon the types of improvement projects listed, it can be assumed that the work would all be locally specific and disperse with short construction durations resulting in mostly temporary impacts from sedimentation and work in and near the waterways.

Projects that would potentially directly affect coho salmon and their designated Critical Habitat in the San Lorenzo River Watershed would be subject to regulatory permit approval through the National Marine Fisheries Service. Furthermore, project impacting water quality through the release of pollutants and sediments into the San Lorenzo River Watershed are subject to permit approval and regulation by the Central California Coast Regional Water Quality Control Board since the San Lorenzo River Watershed has been identified on the Central Coast Regional Water Quality Control Board 303(d) list for Total Maximum Daily Loads Priority Schedule of impaired waters. Kings Creek is a tributary to the San Lorenzo River and follows the same guidelines for purposes of water quality. Under the U.S. Clean Water Act, Total Maximum Daily Loads is a regulatory plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

A few of these improvement projects would ultimately improve fish passage, increase Critical Habitat and Essential Fish Habitat area, and/or reduce the sedimentation in the San Lorenzo River Watershed, which would be a net benefit to protected fish species. It is anticipated that all potential significant effects of these projects would be mitigated, if necessary, through individual project measures and permit approval conditions. Based on this evaluation, it is unlikely that significant cumulative impacts to Central California Coast coho salmon Evolutionary Significant Unit and designated Central California Coast Coho Salmon Critical Habitat and Essential Fish Habitat in the San Lorenzo River Watershed will occur.

Central California Coast Steelhead Distinct Population Segment and Critical Habitat

The recently constructed and future identified projects with potential cumulative effects on the Central California Coast steelhead Distinct Population Segment and designated Central California Coast Steelhead Critical Habitat in the San Lorenzo River Watershed are mostly road and drainage improvement projects involving repair and replacement of roadways, bridges/viaducts, culverts, scour mitigation, and retaining walls, all undertaken by public agencies. Due to the varied scheduling of environmental analysis, information regarding individual project impacts is limited at best. Therefore, a quantifiable and reliable model for evaluation is not feasible. Based upon the types of improvement projects listed, it can be assumed that the work would all be locally specific and disperse with short construction durations resulting in mostly temporary impacts from sedimentation and work in and near the waterways.

Projects that would potentially directly affect steelhead and their designated Critical Habitat in the San Lorenzo River Watershed would be subject to regulatory permit approval through the National Marine Fisheries Service. Furthermore, project impacting water quality through the release of pollutants

and sediments into the San Lorenzo River Watershed are subject to permit approval and regulation by the Central California Coast Regional Water Quality Control Board since the San Lorenzo River Watershed has been identified on the Central Coast Regional Water Quality Control Board 303(d) list for Total Maximum Daily Loads Priority Schedule of impaired waters. Kings Creek is a tributary to the San Lorenzo River and follows the same guidelines for purposes of water quality. Under the U.S. Clean Water Act, Total Maximum Daily Loads is a regulatory plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

A few of these improvement projects would ultimately improve fish passage, increase Critical Habitat area, and/or reduce the sedimentation in the San Lorenzo River Watershed, which would be a net benefit to protected fish species. It is anticipated that all potential significant effects of these projects would be mitigated, if necessary, through individual project measures and permit approval conditions. Based on this evaluation, it is unlikely that significant cumulative impacts to Central California Coast steelhead Distinct Population Segment and designated Central California Coast Steelhead Critical Habitat in the San Lorenzo River Watershed will occur.

Chapter 3 CEQA Evaluation

3.1 Determining Significance under CEQA

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act and the National Environmental Policy Act. The Federal Highway Administration'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 U.S. Code 327) and the Memorandum of Understanding dated December 23, 2016 and executed by the Federal Highway Administration and Caltrans. Caltrans is the lead agency under California Environmental Quality Act and the National Environmental Policy Act.

One of the main differences between the National Environmental Policy Act and the California Environmental Quality Act is the way significance is determined. Under the National Environmental Policy Act, significance is used to determine whether an Environmental Impact Statement, or a lower level of documentation, would be required. The National Environmental Policy Act requires that an Environmental Impact Statement be prepared when the proposed federal action (the 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 the California Environmental Quality Act may not be of enough magnitude to be determined significant under the National Environmental Policy Act. Under the National Environmental Policy Act, once a decision is made regarding the need for an Environmental Impact Statement, it is the magnitude of the impact that is evaluated, and no judgment of its individual significance is deemed important for the text. The National Environmental Policy Act does not require that a determination of significant impacts be stated in the environmental document.

The California Environmental Quality Act, 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 Environmental Impact Report must be prepared. Each and every significant effect on the environment must be disclosed in the Environmental Impact Report and mitigated if feasible. In addition, the California Environmental Quality Act Guidelines list "mandatory findings of significance," which also require the preparation of an Environmental Impact Report. There are no

types of actions under the National Environmental Policy Act that parallel the findings of mandatory significance of the California Environmental Quality Act. This chapter discusses the effects of this project and California Environmental Quality Act significance.

3.2 CEQA Environmental Checklist

This checklist identifies physical, biological, social, and regulatory factors that might be affected by the proposed project. Potential impact determinations include Significant and Unavoidable Impact, Less Than Significant With Mitigation Incorporated, Less Than Significant Impact, and No Impact. In many cases, background studies performed in connection with a project will indicate that there are no impacts to a particular resource. A No Impact answer reflects this determination. The words "significant" and "significance" used throughout the following checklist are related to the California Environmental Quality Act, not the National Environmental Policy Act, impacts. The questions in this checklist are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project, and standardized measures that are applied to all or most Caltrans projects such as Best Management Practices 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 to provide you 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.

3.2.1 Aesthetics

CEQA Significance Determinations for Aesthetics

Except as provided in Public Resources Code Section 21099, would the project:

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

Less Than Significant Impact—Scenic vistas throughout the project area mostly include close-up to mid views of steep topography and hillsides, streamside areas, native vegetative patterns, and mostly undeveloped landscapes. The most noticeable aspect of the project will be the widened shoulders on the bridge and new, slightly taller bridge rails on both bridges. Depending on the height of the driver's viewing position, views from the

roadway to the riparian areas will be affected to some degree by the bridge rail. The metal bicycle rail on the top of the bridge rail will be darkened to visually recede.

The existing overhead utility lines and poles that are on both sides of the highway will be relocated farther away from the roadway. The poles and lines will still have a backdrop of vegetation so that the change will be largely unnoticed by the casual observer. The proposed retaining walls will be parallel to and lower than the elevation of the highway, thus the visibility of the walls from the highway is not expected. As a result of these changes, the highway environment in the immediate project vicinity will be somewhat altered, although the effect on the scenic vistas will be minimal.

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

No Impact—The project will not damage any scenic resources because this portion of State Route 9 is not within the Designated Scenic Highway limits.

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?

Less Than Significant Impact—The existing scenic quality of State Route 9 is based to a large degree on its well-vegetated and forested character. The communities of Boulder Creek and Redwood Grove, as well as the highway itself, also contribute to the overall character of the site and its surroundings.

Proposed project elements such as widened shoulders, metal guardrails and transitions, and new bridge rails will be readily visible from the roadway. By themselves, these types of elements are not uncommon and will not be seen as unexpected visual elements in a highway setting. The new guardrails and bridge rails will be slightly taller than the existing guardrails and bridge rails, which when seen with the wider road shoulders, will increase the visual scale and engineered appearance of the highway. The addition of all these elements together will create a slightly more engineered-looking highway facility and will add a degree of visual clutter to the setting. As a result, these visual changes will cause a minor reduction of rural character and visual quality to the immediate project area.

Although existing trees and other plants will be removed by the project, vegetation removal will be fully replaced and established. As a result, the streamside areas will over time be fully revegetated and result in a somewhat natural appearing visual condition. Construction access roads and areas of

demolition, if restored to natural-appearing landforms will reduce the noticeability of disturbance and engineered alterations.

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

No Impact—No new sources of light or glare are proposed as part of the project.

3.2.2 Agriculture and Forest Resources

CEQA Significance Determinations for Agriculture and Forest Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection 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?

No Impact—According to the California Department of Conservation's Farmland Mapping and Monitoring Program, no farmlands or vacant lands that have been mapped as Prime Farmlands, Unique Farmlands, Farmlands of Statewide Importance, or Farmlands of Local Importance occur within the vicinity of the project. The project will not have any direct or indirect impacts that would convert farmland. (Sources: California Department of Conservation's Farmland Mapping and Monitoring Program, *County of Santa Cruz General Plan and Town Plan*)

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact—According to the *County of Santa Cruz General Plan and Town Plan*, no lands with existing zoning for agriculture use or lands subject to

Williamson Act contracts occur within the vicinity of the project. The project will not have any direct or indirect impacts that would conflict with lands with existing zoning for agriculture use or lands subject to Williamson Act contracts. (Sources: California Department of Conservation's Farmland Mapping and Monitoring Program, *County of Santa Cruz General Plan and Town Plan*)

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))?

No Impact—The proposed bridge replacement project will not require any right-of-way or property from lands identified within a Timber Production Zone per the California Timberland Productivity Act of 1982 (CA Government Code Sections 51100 and following), which was enacted to preserve forest resources. According to the *County of Santa Cruz General Plan and Town Plan*, the proposed project will not affect any lands designated or zoned as timberland. (Sources: California Department of Conservation's Farmland Mapping and Monitoring Program, *County of Santa Cruz General Plan and Town Plan*)

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Less Than Significant—The project will involve removal of forest trees from the project area for bridge access and temporary utility relocation. Removed trees will be replaced after construction in accordance with regulatory agency permit conditions. Permanent impacts to forest trees will result from the loss of 0.237 acre of unpaved road shoulder and California Coast redwood forest understory that will be paved to support a road taper from the existing alignment to the newer, wider bridges. According to the *County of Santa Cruz General Plan and Town Plan*, the proposed bridge replacement project will not require any right-of-way or property from lands identified within a Timber Production Zone per the California Timberland Productivity Act of 1982 (CA Government Code Sections 51100 and following). Even though some forest trees will be removed from the project site, potential impacts involving the loss of forest land or conversion of forest land to non-forest use will be less than significant.

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?

Less Than Significant—The proposed project will replace two existing bridges within the existing state right-of-way. The project will involve removal of forest trees from the project area for bridge access and temporary utility

relocation. Removed trees will be replaced after construction in accordance with regulatory agency permit conditions. Permanent impacts to forest trees will result from the loss of 0.237 acre of unpaved road shoulder and California Coast redwood forest understory that will be paved to support a road taper from the existing alignment to the newer, wider bridges. The state ***and County** rights-of-way within the project area are considered non-forest use. No right-of-way expansion or realignment will occur. The proposed bridge replacement project will not require any right-of-way or property from lands identified within a Timber Production Zone per the California Timberland Productivity Act of 1982 (CA Government Code Sections 51100 and following). Even though some forest trees will be removed from the project site, potential impacts resulting in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use will be less than significant.

3.2.3 Air Quality

CEQA Significance Determinations for 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:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant—As discussed in Section 2.4.1 (Air Quality), the project will not reduce mobile source emissions in the air basin in accordance with the goals of the Monterey Bay Unified Air Pollution Control District *2012-2015 Air Quality Management Plan*. However, air pollutant emissions will be temporary and minimal, and the project will comply with all required California Air Resources Board and Monterey Bay Unified Air Pollution Control District rules, ordinances, and regulations. Temporary construction-related usage will be outweighed by the additional transportation energy usage from trip rerouting if the bridge will fail in the future should the No-Build Alternative be selected.

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?

Less Than Significant—The project area is considered in attainment for all federal ambient air quality standards and non-attainment transitional for state ambient air quality standards for ozone and non-attainment for airborne particulate less than 10 microns in diameter. The replacement of the two existing bridges will not result in the emission of any long-term pollutants, as discussed in Section 2.4.1 (Air Quality). Based upon review of the federal guidelines, this project will qualify for an exemption from further air quality

review because it consists of bridge reconstruction (with no additional travel lanes) which is considered exempt from federal conformity analysis.

All air quality impacts associated with the project will be temporary and will result from demolition and construction activities that produce fugitive dust and ozone precursors, like nitrogen oxides. Construction duration is estimated to take a combined 18 months ***of activity over a three-year period** and is expected to progress quickly once the construction contract is awarded. Standard provisions included for all Caltrans projects will address potential emissions generated by construction equipment, grading activities, and various construction materials. Impacts associated with 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 will be Less Than Significant.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant—The replacement of the two existing bridges will not result in the emission of any long-term pollutants, as discussed in Section 2.4.1 (Air Quality). All air quality impacts associated with the project will be temporary and will result from demolition and construction activities. Construction duration is estimated to take a combined 18 months ***of activity over a three year period** and is expected to progress quickly once the construction contract is awarded. With almost every construction project, there will be a short-term temporary increase in air emissions and fugitive dust during the construction period. Exhaust from construction equipment contains hydrocarbons, oxides of nitrogen, carbon dioxide, and suspended particulate matter. Removing the existing bridge structures will require demolition activities and earthwork that potentially could create nuisance dust near the actual work location but is not expected to be significant enough to impact the nearest residences. Standard provisions included for all Caltrans projects will address potential emissions generated by construction equipment, grading activities, and various construction materials. Due to the small scope of work and its location, impacts associated with the exposure of sensitive receptors to substantial pollutant concentrations will be Less Than Significant.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant—As discussed in Section 2.4.1 (Air Quality), the replacement of the two existing bridges will not result in permanent impacts due to ongoing emissions (such as those leading to odors). Certain construction activities can be the source of temporary odor-producing activities that occur during demolition, excavation and grading, construction, and paving. Standard provisions included for all Caltrans projects will address

potential emissions generated by construction equipment, grading activities, and various construction materials.

Construction duration is estimated to take a combined 18 months ***of activity over a three year period** and is expected to progress quickly once the construction contract is awarded. Due to the small scope of work and its limited duration and location, this project presents minimal potential to subject surrounding sensitive receptors to inhalable construction emissions that would be considered significant, therefore, project impacts involving emissions (such as those leading to odors) are expected to be Less Than Significant.

3.2.4 Biological Resources

CEQA Significance Determinations for Biological Resources

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant with Mitigation Incorporated—Even after implementation of standard water quality Best Management Practices and Caltrans Standard Specifications for pollution control identified in Section 2.2.2 (Water Quality and Storm Water Runoff), the project will have impacts on federally listed Central California Coast coho salmon Evolutionary Significant Unit (*Oncorhynchus kisutch*) and Central California Coast steelhead Distinct Population Segment (*Onchorhynchus mykiss irideus*).

Impacts to California giant salamander and Santa Cruz black salamander are discussed in Section 2.3.3 (Animal Species) and will result in potential take of both species and disturbance of habitat. These impacts to California giant salamander and Santa Cruz black salamander will be reduced to less than significant through the implementation of avoidance and minimization measures listed in Section 2.3.3 which includes measures listed in:

- Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing;
- Section 2.3.4 for worker training; and
- Section 2.3.3 for preconstruction surveys, initial ground disturbance, exclusion fencing, aquatic salamander relocation, and habitat restoration for California giant salamander and Santa Cruz black salamander.

Compensatory mitigation is not expected because the project will only temporarily impact salamander species and their habitat

Impacts to Central California Coast coho salmon Evolutionary Significant Unit and Central California Coast steelhead Distinct Population Segment are fully discussed in Section 2.3.4 (Threatened and Endangered Species) and will result in potential take of both species and disturbance of habitat. These temporary impacts to Central California Coast coho salmon Evolutionary Significant Unit and Central California Coast steelhead Distinct Population Segment will be reduced to less than significant through the implementation of avoidance and minimization measures listed in Section 2.3.4 which includes measures listed in:

- Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration;
- Section 2.3.4 for vegetation removal proposed to protect Central California Coast Coho Salmon Essential Fish Habitat;
- Section 2.3.4 for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring identified for Central California Coast Coho Salmon Critical Habitat; and
- Section 2.3.4 for biological monitoring and fish relocation, and dewatering pumps identified for Central California Coast coho salmon Evolutionary Significant Unit and Central California Coast steelhead Distinct Population Segment.

The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts 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 or U.S. Fish and Wildlife Service. No additional compensatory mitigation is expected because the project will only temporarily impact special status species.

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?

Less Than Significant Impact with Mitigation Incorporated—Impacts to riparian habitat, Essential Fish Habitat, Central California Coast Coho Salmon Critical Habitat, and Central California Coast Steelhead Critical Habitat in the San Lorenzo River and Kings Creek will occur from areas in the waterways that will be fully diverted and from access roads through riparian areas to reach the waterways.

Temporary impacts at the San Lorenzo River Bridge project site will total 12,066 square feet (0.277 acre) and at the Kings Creek Bridge project site will

total 8,364 square feet (0.192 acre). Estimated temporary impacts to the associated riparian zone along the San Lorenzo River will total 0.022 acre (960 square feet) and along the Kings Creek will total 0.015 acre (650 square feet. In Kings Creek, there are currently two pier columns and foundations that will be removed, as the new bridge will fully span the creek without piers. One of the pier columns and its foundation is in riparian habitat. Approximately 0.0003 acre (13 square feet) of riparian area will be created through the removal of this pier column and foundation. No permanent adverse effect will occur to the associated riparian zone within the project sites.

Impacts to riparian areas will be reduced to less than significant through the implementation of avoidance and minimization measures identified in Section 2.3.1 which includes measures listed in:

- Section 2.3.2 (Wetlands and Other Waters) for contour restoration; and
- Section 2.3.5 (Invasive Species) for revegetation plans.

Even after implementation of standard water quality Best Management Practices and Caltrans Standard Specifications for pollution control identified in Section 2.2.2 (Water Quality and Storm Water Runoff), the project will have impacts on federally designated Freshwater Essential Fish Habitat for coho salmon, Central California Coast Coho Salmon Critical Habitat, and Central California Coast Steelhead Critical Habitat. The boundary for Freshwater Essential Fish Habitat for coho salmon, Central California Coast Coho Salmon Critical Habitat, and Central California Coast Steelhead Critical Habitat is the Ordinary High Water Mark.

The proposed project will cause a total of 0.054 acre (2,350 square feet) of temporary impacts to Essential Fish Habitat and Critical Habitat: 0.032 acre (1,395 square feet) at the San Lorenzo River and 0.022 acre (960 square feet) at Kings Creek. The Kings Creek Bridge replacement will result in a net reduction of permanent man-made structures in Essential Fish Habitat and Critical Habitat areas by 0.0005 acre (22 square feet).

Demolition and construction phases of the project will generate sediment, but if a cofferdam is constructed for the removal of pier foundations, the impact on Essential Fish Habitat will be reduced. The appropriate best management practices will be deployed to control sediment transport into the stream channel resulting from abutment removal and installation. Degradation of water quality will be minimized through proper engineering controls. Oil, grease, and other pollutants, including metals and pesticides, are not anticipated to enter the waterways when proper best management practices are applied to construction activities.

Impacts to federally designated Freshwater Essential Fish Habitat for coho salmon, Central California Coast Coho Salmon Critical Habitat, and Central

California Coast Steelhead Critical Habitat will be reduced to less than significant through the implementation of avoidance and minimization measures identified in Section 2.3.4 which includes measures listed in:

- Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration; and
- Section 2.3.4 for vegetation removal proposed to protect Central California Coast Coho Salmon Essential Fish Habitat, and for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring proposed to protect Central California Coast Coho Salmon Critical Habitat.

The compensatory mitigation in Section 2.3.4 for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to 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. No additional compensatory mitigation is expected because the project will only temporarily impact riparian habitat, Freshwater Essential Fish Habitat for coho salmon, Central California Coast Coho Salmon Critical Habitat, and Central California Coast Steelhead Critical Habitat, and will ultimately result in a net-benefit for protected fish species and riparian habitat as they will gain 0.0005 acre (22 square feet) of streambed habitat.

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?

Less Than Significant Impact with Mitigation—Even after implementation of standard water quality Best Management Practices and Caltrans Standard Specifications for pollution control identified in Section 2.2.2 (Water Quality and Storm Water Runoff), the project will have impacts to state protected wetlands. The project will involve widening the paved area at the San Lorenzo River bridge to allow for the necessary guardrail and taper. Impacts to the wetland feature found southwest of the bridge will total 0.001 acre (43.5 square feet). Wetland impacts are considered temporary, because the wetland will be restored adjacent to the road, but it will be shifted slightly to the west. The adjacent slope will be contoured to maintain the existing hydrologic source to the slope wetland.

Impacts to protected wetlands will be reduced to less than significant through the implementation of avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) which includes measures for environmentally sensitive fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration. Compensatory

mitigation for permanent impacts to wetland areas is not expected because the project will only temporarily impact protected wetlands.

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?

Less Than Significant with Mitigation Incorporated—The project will potentially impact American peregrine falcon, osprey, and other native and migratory birds as discussed in Section 2.3.3 (Animal Species). These impacts will be reduced to less than significant through the implementation of avoidance and minimization measures listed in Section 2.3.3 which includes measures listed in:

- Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing;
- Section 2.3.4 (Threatened and Endangered Species) for worker education programs proposed to protect Central California Coast Coho Salmon Critical Habitat; and
- Section 2.3.3 for vegetation removal, nesting bird preconstruction survey, active nest buffer, tree protection, rodent control for American peregrine falcon, osprey, and other native and migratory birds.

Compensatory mitigation is not expected because the project will only temporarily impact American peregrine falcon, osprey, and other nesting and migratory bird habitat which will be replaced in the riparian zones after the new bridges are completed.

Even after implementation of standard water quality Best Management Practices and Caltrans Standard Specifications for pollution control identified in Section 2.2.2 (Water Quality and Storm Water Runoff), the project will have impacts that could interfere with the movement of native resident and migratory fish through the project site. A stream diversion will be required at both the San Lorenzo River and Kings Creek locations for up to three consecutive years. There will be no in-water work, including the dewatering and diversion plan implementation, between October 31 and May 30, when adult coho salmon and steelhead could be present. Juvenile fry and fingerlings could be present within the streams all year and could be impacted by the water diversion. During the dewatering, exclusions and relocations will be required if coho salmon or steelhead are present, which could create stress for the fish. Relocating animals out of their preferred habitat may make them expend more energy finding food and cover. The higher velocity flows within the pipe diversion could make it more difficult for small fry to swim or find shelter in the project area and biological study areas and push them further downstream. Additionally, once a diversion is in place, fine sediments may accumulate upstream of the diversion because of the limited capacity of the diversion.

The removal of vegetation for three consecutive years will reduce shade in the biological study areas and may inadvertently increase the water temperature in the project footprint. The effects will be localized, and not so strong as to injure fish due to an increased temperature, but it may reduce the amount of shade and cover available for the species during construction. That may force the fish to expend more energy finding cover and shelter outside the project footprint.

There will be direct and indirect temporary negative impacts due to the implementation of a stream diversion/dewatering plan, fish relocation, and tree removal, but those will be minimized with the appropriate measures. Therefore, the project will likely impact the movement of native resident and migratory fish species, including the Central California Coast coho salmon Evolutionary Significant Unit and the Central California Coast steelhead Distinct Population Segment, and there may be take of both species. Ultimately, removing the existing piers in the riparian and stream habitat will be a net benefit to the species and will provide additional habitat for movement of juveniles and adults.

Impacts to the movement of any native resident or migratory fish species will be reduced to less than significant through the implementation of avoidance and minimization measures identified in Section 2.3.4 for Central California Coast coho salmon Evolutionary Significant Unit and Central California Coast steelhead Distinct Population Segment, which includes measures listed in:

- Section 2.3.2 for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration;
- Section 2.3.4 for vegetation removal proposed to protect Essential Fish Habitat for Central California Coast coho salmon;
- Section 2.3.4 for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, and biological monitoring to protect Central California Coast Coho Salmon Critical Habitat; and
- Section 2.3.4 for biological fish monitoring and fish relocation and dewatering pumps to protect Central California Coast coho salmon Evolutionary Significant Unit and Central California Coast steelhead Distinct Population Segment.

The compensatory mitigation in Section 2.3.4 for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to 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. No additional compensatory mitigation is expected because the project will only temporarily impact 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, and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat of movement and nursery use.

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

No Impact—The County of Santa Cruz does not have any local policies or ordinances protecting biological resources that will apply since the project site is not within the Coastal Zone or subject to development review by the County. Therefore, no conflict will occur (see Chapter 2 "Coastal Zone" and "Consistency with State, Regional, and Local Plans and Programs").

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?

No Impact—No conflict will occur because the project site is not within or adjacent to any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. More detailed information on biological resources can be found in Section 2.3 (Biological Environment).

3.2.5 Cultural Resources

CEQA Significance Determinations for Cultural Resources

Would the project:

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

No Impact—The proposed project will not result in effects to any historical resources as identified in Section 2.1.5 (Cultural Resources) of this document. (Source: June 2019 Historic Property Survey Report and Archaeological Survey Report for San Lorenzo River Bridge and Kings Creek Bridge Replacement Project)

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

No Impact—The proposed project will likely not result in changes to any archaeological resources as identified in Section 2.1.5 (Cultural Resources) of this document. (Source: June 2019 Historic Property Survey Report and Archaeological Survey Report for San Lorenzo River Bridge and Kings Creek Bridge Replacement Project)

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

Less Than Significant Impact—According to the June 2019 Historic Property Survey Report and Archaeological Survey Report prepared for the project, the project sites have been previously disturbed. It is unlikely that any human remains will be disturbed, but the chance cannot be completely eliminated as determined in Section 2.1.5 (Cultural Resources) of this document.

3.2.6 Energy

CEQA Significance Determinations for Energy

Would the project:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

No Impact—The project will include Caltrans Standard Specifications and Standard Special Provisions that include construction practices to reduce and limit consumption of energy resources during project construction. These include practices like turning off idling equipment, limiting materials transport, and limiting night work. The project will not require excessive consumption of energy resources for operation. (Source: December 2020 Air Quality, Noise, and Greenhouse Gas Memo)

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact—The project is not expected to conflict with or obstruct any existing state or local energy plans for renewable energy or energy efficiency (see Section 3.3, Climate Change). (Source: December 2020 Air Quality, Noise, and Greenhouse Gas Memo)

3.2.7 Geology and Soils

CEQA Significance Determinations for Geology and Soils

Would the project:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

Less Than Significant Impact—The proposed project will replace two existing bridges with structurally reinforced bridges that will be built to current seismic standards, as provided in the *Highway Design Manual*. Therefore, it will likely not expose people or structures to substantial adverse effects related to rupture of a known earthquake fault as determined in Section 2.2.3 (Geology, Soils, Seismicity, and Topography).

ii) Strong seismic ground shaking?

Less Than Significant Impact—The proposed project will replace two existing bridges with structurally reinforced bridges that will be built to current seismic standards, as provided in the *Highway Design Manual*. Therefore, it will likely not expose people or structures to adverse effects related to strong seismic ground shaking as determined in Section 2.2.3 (Geology, Soils, Seismicity, and Topography) of this document.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact—As previously discussed in Section 2.2.3 (Geology, Soils, Seismicity, and Topography), foundation soils and groundwater elevations identified in the test borings indicate that the foundation soils are potentially liquefiable. The bridge structure and foundations will be designed and built to minimize potential impacts from liquefiable soils per Caltrans design standards.

iv) Landslides?

Less Than Significant Impact—The risk for landslides is low for the project area as depicted on the County of Santa Cruz Landslide Hazard Area map (2009). There will be likely be no substantial adverse effects on construction workers or the traveling public resulting from landslides as determined in Section 2.2.3 (Geology, Soils, Seismicity, and Topography).

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact—The potential for erosion from project implementation will be minimal as discussed in Section 2.2.3 (Geology, Soils, Seismicity, and Topography). There are no soil erosion concerns at San Lorenzo River Bridge site since there is no history of soil erosion and the bridge is not considered scour critical. Temporary slopes and/or shoring may be required for spread footings to reach the elevation of rock required for scour considerations at the Kings Creek Bridge site. The contractor will provide a design for temporary shoring, and the design will be approved by Caltrans.

Excavations and grading activities will disturb and expose soils at both bridge site locations during project construction; therefore, a potential for soil erosion exists. Stormwater pollution control requirements are intended to be

implemented on a year-round basis at an appropriate level. The requirements must be implemented in a proactive manner during all seasons while construction is ongoing. Appropriate water pollution control includes the implementation of an effective combination of both soil stabilization and sediment controls, implementation of wind erosion, tracking controls, non-stormwater and waste management, and material pollution Best Management Practices. As identified in Section 2.2.2 (Water Quality and Storm Water Runoff) stormwater pollution control requirements will be included during the Plans, Specifications, and Estimates phase of the project and will minimize any impacts to soil from erosion. Also, biological measures for erosion control, site restoration, and tree and shrub replacement identified in Section 2.3.4 (Threatened and Endangered Species) will further minimize soil erosion. Compliance with regulatory requirements will ensure that impacts associated with substantial soil erosion or the loss of topsoil will be less than significant. No avoidance, minimization, or mitigation measures are necessary.

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?

Less Than Significant Impact—As previously discussed in Section 2.2.3 (Geology, Soils, Seismicity, and Topography), the risk of landslides in the project area is minimal. As-built plans for both bridges indicate that sandy soils were encountered below the groundwater table, and these soils may be susceptible to liquefaction. Since inadequate subsurface information exists at this time for evaluation of the groundwater, liquefaction, and lateral spread potentials for the soils overlying the rock formations at the bridge sites, a subsurface investigation will be conducted. Typical with bridge construction projects, site-specific geotechnical and geological investigations that focus on the potential liquefaction hazard will be performed as part of the projects Plans, Specifications, and Estimates phase. As necessary, design and construction of the project components will include foundation treatments, such as removal and re-compaction or deep foundations, to reduce impacts from liquefaction. This will ensure that impacts associated with being located on a geologic unit or soil that is unstable, or that will become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse will be less than significant. No avoidance, minimization, or mitigation measures are necessary.

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?

No Impact—According to the preliminary geotechnical reports prepared for the project, site soils are not expansive and consist mostly of degraded sandstone and bedrock and mudstone and sandy loam overlaid by vegetative debris.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact—The proposed project will not involve the construction or use of septic tanks or alternative waste water disposal systems as noted in Section 2.2.2 (Water Quality and Storm Water Runoff).

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact—Since the proposed project will be constructed on existing bridge foundations where previous disturbance has taken place. According to the 2020 Paleontology Scoping Review memorandum prepared for the project, the probability of encountering paleontological resources is remote. No unique geologic features are present in the project area or vicinity as noted in Section 2.2.3 (Geology, Soils, Seismicity, and Topography).

3.2.8 Greenhouse Gas Emissions

CEQA Significance Determinations for Greenhouse Gas Emissions

Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact—Replacing the two bridges will not add highway capacity or increase vehicle miles traveled, and therefore will not increase vehicle emissions during project operation. Construction-related greenhouse gas emissions will result from material processing, delivery, on-site construction equipment, and potential traffic delays. Emissions will be produced at different levels throughout the construction phase. The frequency and occurrence of emissions will be reduced by the implementation of efficient traffic management and control during construction phases and other construction greenhouse gas reduction measures.

The greenhouse gas emission discussion is based on Climate Change guidance provided by the Caltrans Division of Environmental Analysis. According to the guidance, there are several categories of projects that most likely will have minimal or no increase in operational greenhouse gas emissions, including roadway improvement such as the proposed project. Further discussion of greenhouse gas emissions can be found in Section 3.3 (Climate Change).

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant—The project will not alter existing highway capacity or alignment and will not conflict with plans, policies, or regulations for reducing greenhouse gas emissions. All construction contracts will include Caltrans Standard Specifications that require compliance with all California Air Resources Board rules, regulations, ordinances, and statutes, some of which can reduce greenhouse gas construction emissions. Further discussion of greenhouse gas emissions can be found in Section 3.3 (Climate Change).

3.2.9 Hazards and Hazardous Materials

CEQA Significance Determinations for Hazards and Hazardous Materials

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact—According to the 2020 Hazardous Waste Initial Site Assessment prepared for the project, the project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

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?

Less Than Significant—Proposed bridge demolition and removal will potentially involve the release of hazardous materials into the environment as discussed in Section 2.2.4 (Hazardous Waste and Materials) of this document. Compliance with regulations and the required plans will ensure that hazards to the public or the environment through reasonably foreseeable upset and accident the transport, use, or disposal of hazardous materials will be minimal.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact—Based on available online mapping for the County of Santa Cruz, there are no existing or proposed schools within one-quarter mile of the two project sites. Therefore, the project will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

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?

No Impact—According to the November 2020 Hazardous Waste Initial Site Assessment prepared for the project, the proposed project is not located on sites which are included on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5.

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?

No Impact—According to Federal Aviation Administration maps, the project is not located within an airport land use plan or within two miles of a public airport or public use airport. The project will not result in a safety hazard or excessive noise for people residing or working in the project area.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact—Except for intermittent full traffic closures for some deck demolition and the placement of girders and traffic control devices, bidirectional flow of traffic will be maintained throughout project construction as noted in Section 2.4 (Temporary Construction Impacts). Temporary traffic control is required for all Caltrans projects that involve lane closures. As is typical for lane closures, the traffic control strategies prepared for the project will allow for adequate emergency access. The proposed project will coordinate and notify regional emergency service providers of construction-related activities to provide advance notice and to allow for planning. Emergency service providers will be notified of any project activities that may have the potential to restrict or prevent emergency service access within the project area. The project will include Caltrans Standard Specifications and Caltrans Standard Special Provisions pertaining to actions and strategies that will help maintain a safe environment for construction workers and the traveling public.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less Than Significant—The two project sites are in a State Responsibility Area that is designated as a Moderate Fire Hazard Severity Zone, and the sites are surrounding by lands designated as High Fire Hazard Severity Zones. The nearest area designated as Very High Fire Hazard Zone is over four miles away to the southwest. Caltrans routinely coordinates with emergency service providers as part of regular route and construction

management. The project will not result in any permanent impacts involving wildland fires. However, project construction activities may result in minor temporary impacts to emergency service response times, which are fully discussed in Section 2.4 (Construction Impacts).

3.2.10 Hydrology and Water Quality

CEQA Significance Determinations for Hydrology and Water Quality

Would the project:

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

Less Than Significant Impact—The proposed project will have temporary and minor effects on water quality and will result in minimal waste discharge as noted in Section 2.2.2 (Water Quality and Storm Water Runoff). Compliance with applicable regulations and permits will ensure that water quality standards or waste discharge requirements will not be violated, and surface and ground water quality will not be substantially degraded.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less Than Significant Impact—The project will not significantly increase the amount of impervious surface and will not significantly decrease the amount of area available for infiltration as identified in Section 2.2.2 (Water Quality and Storm Water Runoff). The impact of slightly wider bridges and paved shoulders will be negligible on groundwater resources.

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;

Less Than Significant Impact—Ground-disturbing earthwork associated with demolition and construction will increase soil erosion rates and the loss of topsoil as discussed in Sections 2.2.2 (Water Quality and Storm Water Runoff) and 2.2.3 (Geology, Soils, Seismicity, and Topography) of this document. However, the potential for erosion or siltation will be minimal because of the types of soil present in the project area and compliance with applicable permits and regulations.

ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

Less Than Significant Impact—The project sites are located within designated floodplains and floodways as discussed in Section (2.2.1 Hydrology and Floodplain). The proposed project will not result in adverse effects that will substantially alter the existing drainage pattern of the sites or area, including substantially increasing the rate or amount of surface runoff in a manner which will result in flooding on or off the site.

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

No Impact—Section 2.2.1 (Hydrology and Floodplain) discusses the project's potential environmental consequences relating to hydrology. New and replaced stormwater systems associated with the project will be designed to have the capacity to adequately handle runoff and will not provide substantial additional sources of polluted runoff. (Source: June 2016 1H470 Preliminary Hydraulic Report; November 2019 1H470 Hydraulic Recommendations)

iv) Impede or redirect flood flows?

Less Than Significant Impact—The project sites are within designated floodplains and floodways as noted in Section 2.2.1 (Hydrology and Floodplain). The proposed project will result in an overall improvement of flood flows for the area and will not create adverse effects from impeded or redirected flood flows.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less Than Significant Impact—Although both project sites are in designated Federal Emergency Management Agency floodplains and floodways, effects associated with inundation of the site will be minimal. As discussed in Sections 2.2.2 (Water Quality and Storm Water Runoff) and 2.4.2 (Hazardous Waste and Materials) potential effects will be further reduced through project design and implementation of best management practices, standard practices, and specifications.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact—The project will not conflict with or obstruct implementation of any water quality control plan or sustainable groundwater management area as evaluated in Section 2.2.2 (Water Quality and Storm Water Runoff) of this document. (Source: May 2009 *San Lorenzo River Watershed Management Plan*)

3.2.11 Land Use and Planning

CEQA Significance Determinations for Land Use and Planning

Would the project:

a) Physically divide an established community?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancement to an existing bus stop at an existing location along State Route 9 (see Chapter 1). The project will not divide an established community, but it will instead maintain and preserve an existing link over local rivers and streams that physically divide the region. (Source: *Santa Cruz County General Plan and Town Plan*)

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?

No Impact—According to the *Santa Cruz County General Plan and Town Plan*, the proposed bridge sites are not subject to any land use plans, policies, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. (Sources: *Santa Cruz County General Plan and Town Plan*; Association of Monterey Bay Area Governments 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy; December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report

3.2.12 Mineral Resources

CEQA Significance Determinations for 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?

No Impact—No known mineral resources exist at the project location, nor will the project interfere with any known mineral resource availability according to Chapter 5 “Conservation and Open Space” of the *Santa Cruz County General Plan and Town Plan* and associated mapping.

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?

No Impact—According to Chapter 5 “Conservation and Open Space” of the *Santa Cruz County General Plan and Town Plan* and associated mapping, no locally important mineral resource recovery sites are located within the project

area, nor will the project 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.

3.2.13 Noise

CEQA Significance Determinations for Noise

Would the project result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact—Construction noise effects will be minimal and temporary in nature. Impacts and avoidance and minimization measures are discussed in Section 2.4 (Temporary Construction Impacts).

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact—Construction-related groundborne vibration and noise effects will be minimal and temporary in nature. Temporary construction impacts and avoidance and minimization measures are discussed in Section 2.4 (Temporary Construction Impacts).

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?

No Impact—According to Federal Aviation Administration maps, the project is not located within the vicinity of a private airstrip or an airport land use plan, or within two miles of a public airport or public use airport. The project will not expose people residing or working in the project area to excessive noise levels as discussed in Section 2.4 (Temporary Construction Impacts).

3.2.14 Population and Housing

CEQA Significance Determinations for Population and Housing

Would the project:

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact—The project will replace two existing bridges and improve an existing bus stop on an existing highway without altering the current highway capacity. It will not change accessibility or influence growth. No direct or indirect impacts on growth will occur as discussed in the beginning of Chapter 2. (Source: *Santa Cruz County General Plan and Town Plan*)

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact—The project will replace two existing bridges and improve an existing bus stop on an existing highway without altering the current highway capacity. It will not displace substantial numbers of people or housing, and the construction of replacement housing is not anticipated. No direct or indirect impacts on growth will occur as discussed in the beginning of Chapter 2. (Source: *Santa Cruz County General Plan and Town Plan*)

3.2.15 Public Services

CEQA Significance Determinations for 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:

Fire protection?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at an existing location on State Route 9 (see Chapter 1). The project will not require the alteration or creation of facilities related to fire protection. (Source: *Santa Cruz County General Plan and Town Plan*)

Police protection?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at an existing location on State Route 9 (see Chapter 1). The project will not require the alteration or creation of facilities related to police protection. (Source: *Santa Cruz County General Plan and Town Plan*)

Schools?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at an existing location on State Route 9 (see Chapter 1). The project will not require

the alteration or creation of facilities related to schools. (Source: *Santa Cruz County General Plan and Town Plan*)

Parks?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at an existing location on State Route 9 (see Chapter 1). The project will not require the alteration or creation of facilities related to parks. (Source: *Santa Cruz County General Plan and Town Plan*)

Other public facilities?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at an existing location on State Route 9 (see Chapter 1). The project will not require the alteration or creation of facilities related to other public facilities. (Source: *Santa Cruz County General Plan and Town Plan*)

3.2.16 Recreation

CEQA Significance Determinations for 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?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at existing locations on State Route 9 (see Chapter 1). The project will not result in direct or indirect impacts that will increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated. (Sources: *Santa Cruz County General Plan and Town Plan*; December 2020 1H470 San Lorenzo Bridge and Kings Creek Bridge Replacement Draft Project Report)

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?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at existing locations on State Route 9 (see Chapter 1). The project does not include any recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. (Source: *Santa Cruz County General Plan and Town Plan*)

3.2.17 Transportation

CEQA Significance Determinations for Transportation

Would the project:

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less Than Significant Impact—During construction, temporary lane reduction within the project limits will result in localized traffic delays (see Section 2.4, Temporary Construction Impacts). These effects will be temporary and minor as State Route 9 will remain open throughout construction. The project will not conflict with any applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, accounting for all modes of transportation, including mass transit and nonmotorized travel, and related components of the circulation system, including intersections, streets, highways, freeways, pedestrian and bicycle paths, or mass transit. Rather, replacement of the two existing bridges and minor enhancement of the existing bus stop will ensure the continued operation of the highway system at these locations for all users (see Chapter 1).

b) Conflict with or be inconsistent with California Environmental Quality Act Guidelines section 15064.3, subdivision (b)?

No Impact—The project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop at existing locations on State Route 9 as noted in Chapter 1. It will not increase capacity or vehicle mile traveled as discussed under Transportation in the beginning of Chapter 2. Therefore, the project will not conflict with California Environmental Quality Act Guidelines section 15064.3 subdivision (b).

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact—The project will comply with current Caltrans Highway Design Manual Standards. The project will not substantially increase hazards due to geometric design or incompatible uses. The roadway pavement will be realigned to match the new bridge profiles as noted in Section 1.4.1 (Build Alternative-Replace Bridges). The project will also install metal beam guardrails and crash cushions as appropriate.

d) Result in inadequate emergency access?

Less Than Significant Impact—Except for intermittent full traffic closures for some deck demolition and the placement of girders and traffic control devices, bidirectional flow of traffic will be maintained throughout project

construction as noted in Section 2.4 (Temporary Construction Impacts). Temporary traffic control is required for all Caltrans projects that involve lane closures. As is typical for lane closures, the traffic control strategies prepared for the project will allow for adequate emergency access. The proposed project will coordinate and notify regional emergency service providers of construction-related activities to provide advance notice and to allow for planning. Emergency service providers will be notified of any project activities that may have the potential to restrict or prevent emergency service access within the project area. The project will include Caltrans Standard Specifications and Caltrans Standard Special Provisions pertaining to actions and strategies that will help maintain a safe environment for construction workers and the traveling public.

3.2.18 Tribal Cultural Resources

CEQA Significance Determinations for 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:

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

No Impact—According to tribal consultation efforts documented in the 2019 Historic Property Survey Report and Archaeological Survey Report prepared for the project, the project sites are not 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).

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.

No Impact—According to tribal consultation efforts documented in the 2019 Historic Property Survey Report and Archaeological Survey Report prepared for the project, there are no known resources within the project impact areas that have been determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.

3.2.19 Utilities and Service Systems

CEQA Significance Determinations for Utilities and Service Systems

Would the project:

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?

No Impact—As noted in Chapter 1, the project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop on State Route 9. It will not 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, where the construction or relocation of which could cause significant environmental effects. Proposed new storm water drainage features and existing ones that are proposed for replacement are discussed in Section 2.2.1 (Hydrology and Floodplain).

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

No Impact—The proposed project will replace two existing bridges with new bridge structures and provide minor enhancements to an existing bus stop on State Route 9. It will have sufficient water supplies available to serve the project during normal, dry, and multiple dry years. Additional discussion of this topic can be in Section 1.4.1 (Build Alternative) and under Utilities in the beginning of Chapter 2.

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?

No Impact—Construction of the proposed project will generate a minimal amount of wastewater as detailed in Section 2.2.2 (Water Quality and Storm Water Runoff) of this document. The proposed project will not exceed wastewater treatment requirements, require the construction of new water or wastewater treatment facilities, or result in a determination by the wastewater treatment provider that it does not have adequate capacity to serve the project's projected demand.

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?

No Impact—The proposed project will require the use of a local landfill to dispose of demolition materials. The use of the local landfill will be temporary and occur only during construction. The proposed project will be served by a landfill with enough capacity to serve its solid waste disposal needs during construction. Further discussion of this topic can be found under Public Services in the beginning of Chapter 2.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact—In accordance with California law and the Caltrans Waste Management Plan, Standard Specifications regarding solid waste disposal and recycling of solid waste are included for all Caltrans projects. The project will comply with all federal, state, and applicable local management and reduction statutes related to solid waste. Additional discussion of this topic can be found under Public Services in the beginning of Chapter 2.

3.2.20 Wildfire

CEQA Significance Determinations for Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Less Than Significant—The two project sites are in a State Responsibility Area that is designated as a Moderate Fire Hazard Severity Zone, and the sites are surrounding by lands designated as High Fire Hazard Severity Zones. The nearest area designated as Very High Fire Hazard Zone is over four miles away to the southwest. Caltrans routinely coordinates with emergency service providers as part of regular route and construction management. The project will not result in any permanent impact involving wildfire or evacuation due to wildfire. However, project construction activities may result in minor temporary impacts to emergency service response times, which are fully discussed in Section 2.4 (Construction Impacts). (Source: CalFire Santa Cruz County Fire Hazard Severity Zone Map, accessed February 18, 2020. Available at: https://osfm.fire.ca.gov/media/6768/fhszs_map44.pdf)

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?

Less Than Significant—The two project sites are in a State Responsibility Area that is designated as a Moderate Fire Hazard Severity Zone, and the sites are surrounding by lands designated as High Fire Hazard Severity

Zones. The project area is in a mountain valley with prevailing winds and nearby slopes. However, the new bridges will not exacerbate wildfire risks. Temporary impacts to emergency evacuation from landslide areas could occur during construction due to traffic control measures. Potential traffic delay could expose highway users to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. However, Caltrans routinely coordinates with emergency service providers as part of regular route and construction management to minimize . Consequently, project impacts involving the exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire will be less than significant.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Less Than Significant—The two project sites are in a State Responsibility Area that is designated as a Moderate Fire Hazard Severity Zone, and the sites are surrounding by lands designated as High Fire Hazard Severity Zones. The nearest area designated as Very High Fire Hazard Zone is over four miles away to the southwest. The project will involve the relocation of existing utilities that are in conflict with construction within the state right-of-way. Caltrans will work with the utility operators to ensure compliance with regulatory safety requirements to prevent fire risk. The project will result in less than significant impacts involving the installation or maintenance of associated infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. (Source: CalFire Santa Cruz County Fire Hazard Severity Zone Map, accessed February 18, 2020. Available at: https://osfm.fire.ca.gov/media/6768/fhszs_map44.pdf)

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?

Less Than Significant—According to the U.S. Geologic Service CZU Lightning Complex Post-Fire Debris Flow Hazards web page, lands to the west of State Route 9 suffered extensive damage in the recent 86,509-acre wildfire during 2020. This fire burned for 37 days through California coastal redwood forest, destroyed 1,490 structures, and damaged 140 structures. Due to the intensity of the fire, the roots of many trees are been damaged and soil stability is compromised near waterways in these areas. The majority of these waterways drain into the San Lorenzo River south of the project sites, but there is up to a 20 percent chance that areas upstream of the San Lorenzo River Bridge will be subject to downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability during an intense rain or flood event.

The project will not have permanent impacts that will expose people or structures to significant risk since the project will remove foundations and supports from the waterway at both sites. This will improve drainage flow by removing obstructions from the floodway as discussed in Section 1.4.1 (Build Alternative) and Section 2.2.1 (Hydrology and Floodplain). ***Additional soil and material from landslides caused by the reduction of vegetation within the watershed may temporarily increase the discharge in the waterway relative to the rain and stormflow received, but this is considered a short-term concern. It is estimated that by the time construction for the new bridges is completed, the landslide concern will be reduced due to new vegetation growth. The Caltrans Structural Hydraulics and Hydrology Branch looks at the potential of occurrence, which is based on the chance of a 100-year discharge occurring while the watershed soils are still compromised and after the new structures have been completed, as being lower than a 100-year probability.**

Temporary impacts to emergency evacuation from landslide areas could occur during construction due to traffic control measures. Potential impacts will be minimal since the majority of construction activities and traffic closures will occur outside of the typical rain and high-flow season for the area to avoid impacts to protected fish species. Also, Caltrans routinely coordinates with emergency service providers as part of regular route and construction management. Based on this evaluation, impacts related the exposure of 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 will be less than significant. (Source: .S. Geologic Service CZU Lightning Complex Post-Fire Debris Flow Hazards web page. Available at: https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=299)

3.2.21 Mandatory Findings of Significance

CEQA Significance Determinations for Mandatory Findings of Significance

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

Less Than Significant—Project impacts will be limited in scope and duration. Permanent impacts will total 0.237 acre (10,323 square feet) and will be mostly limited to the unpaved road shoulder and the vegetated understory of California coastal redwood forests within the existing road right-

of-way at both bridge sites. An estimated additional 0.0005 acre (22 square feet) of riparian and fish habitat will be added to Kings Creek due to the removal of two existing piers. Temporary impacts will result from project construction and are estimated to total 0.47 acre (20,475 square feet). Impacts to jurisdictional areas will total 0.092 acre (4,008 square feet) and will be temporary. Most of the temporary impacts will result from vegetation and tree removal and access road construction. Site contours will be returned to preconstruction conditions as feasible and revegetated. Tree removal will be mitigated at the project site with compensatory tree replacement. Slope wetlands will be replaced on site. The most significant biological impacts will be associated with the proposed water diversion and impacts to Central California Coast coho salmon, Central California Coast steelhead, and designated Critical Habitat and Essential Fish Habitat as discussed in Section 2.3.2 and Section 2.3.4. These impacts will be reduced to a less than significant level with previously identified measures. No additional measures are necessary. Therefore, the project does not 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.

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.)

Less Than Significant—The project will have individually limited impacts on resources determined to be in decline from historic cumulative impacts as discussed in Section 2.5 (Cumulative Impacts). These impacts will be temporary in nature as will the impacts of other recently constructed, current, and reasonably foreseeable projects that will affect the same resources. Cumulative impacts to the affected resources are managed through required permits from regulatory agencies, and most of these projects will ultimately result in improvements to the affected resources.

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

Less Than Significant Impact—The project will emit air pollutants and greenhouse gases which have the potential to cause adverse effects on human beings. Demolition and construction activities will require traffic control that could delay traffic and potentially interfere with regular emergency services and evacuations during wildfire and landslide events. However, these impacts will be temporary and limited to the project site. Therefore,

project impacts associated with environmental effects which cause substantial adverse effects on human beings, either directly or indirectly, will not be significant.

3.3 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 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 by the United Nations and World Meteorological Organization in 1988 led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of greenhouse gases generated by human activity, including carbon dioxide, methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, and various hydrofluorocarbons. Carbon dioxide is the most abundant greenhouse gas; while it is a naturally occurring component of Earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated carbon dioxide.

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 greenhouse gas 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.

3.3.1 Regulatory Setting

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

Federal

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

The National Environmental Policy Act (known as NEPA) (Source: 42 U.S. Code Part 4332) requires federal agencies to assess the environmental

effects of their proposed actions prior to making a decision on the action or project.

The Federal Highway Administration 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. The Federal Highway Administration 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 (Source: Federal Highway Administration 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" (Federal Highway Administration). 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 (Source: 42 U.S. Code Section 6201) and Corporate Average Fuel Economy 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 Corporate Average Fuel Economy program based on 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 House of Representatives 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. Environmental Protection Agency in conjunction with the National Highway Traffic Safety Administration is responsible for setting greenhouse gas 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. Fuel efficiency standards directly influence greenhouse gas emissions.

State

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

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

Assembly Bill 32, Chapter 488, 2006, Núñez and Pavley, The Global Warming Solutions Act of 2006: Assembly Bill 32 codified the 2020 greenhouse gas emissions reduction goals outlined in Executive Order S-3-05, while further mandating that the California Air Resources Board create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020 (Source: Health and Safety Code Section 38551(b)). The law requires the California Air Resources Board to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas reductions.

Executive Order S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard for California. Under this Executive Order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. The California Air Resources Board re-adopted the low carbon fuel standard 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 greenhouse gas reduction goals.

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

Senate Bill 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 Assembly Bill 32.

Executive Order B-16-12 (March 2012) orders State entities under the direction of the Governor, including the California Air Resources Board, 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.

Executive Order B-30-15 (April 2015) establishes an interim statewide greenhouse gas emission reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of greenhouse gas emissions to implement measures, pursuant to statutory authority, to achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets. It also directs the California Air Resources Board to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent. (Greenhouse gases differ in how much heat each traps in the atmosphere [global warming potential]. Carbon dioxide is the most important greenhouse gas, so amounts of other gases are expressed relative to carbon dioxide, using a metric called "carbon dioxide equivalent." The global warming potential of carbon dioxide is assigned a value of 1, and the global warming potential of other gases is assessed as multiples of carbon dioxide.) Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, *Safeguarding California*, every three years, and to ensure that its provisions are fully implemented.

Senate Bill 32, Chapter 249, 2016, codifies the greenhouse gas reduction targets established in Executive Order B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

Senate Bill 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 will 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."

Assembly Bill 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 the California Environmental Quality Act from a focus on automobile delay to alternative methods focused on vehicle miles traveled, to promote the state's goals of reducing greenhouse gas emissions and traffic related air pollution and promoting multimodal transportation while balancing the needs of congestion management and safety.

Senate Bill 150**,** Chapter 150, 2017, Regional Transportation Plans: This bill requires the California Air Resources Board 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 greenhouse gas emissions.

Executive Order N-19-19 (September 2019) advances California's climate goals in part by directing the California State Transportation Agency to leverage annual transportation spending to reverse the trend of increased fuel consumption and reduce greenhouse gas emissions from the transportation sector. It orders a focus on transportation investments near housing, managing congestion, and encouraging alternatives to driving. This Executive Order also directs the California Air Resources Board to encourage automakers to produce more clean vehicles, formulate ways to help Californians purchase them, and propose strategies to increase demand for zero-emission vehicles.

3.3.2 Environmental Setting

The project sits along State Route 9 in Santa Cruz County. Within the proposed project limits, State Route 9 is a conventional two-lane, undivided highway that provides vital connectivity for rural mountain communities to the Santa Cruz coastal areas to the south and the San Francisco Bay region to the north. The route travels through the canyons of the San Lorenzo Valley, and it relies on several bridges to accommodate crossings over waterways. The project is located within a rural environment with mostly residential land uses.

A greenhouse gas emissions inventory estimates the amount of greenhouse gases discharged into the atmosphere by specific sources over a period of time, such as a calendar year. Tracking annual greenhouse gas 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. Environmental Protection Agency is responsible for documenting greenhouse gas emissions nationwide, and the California Air Resources Board does so for the state, as required by Health and Safety Code Section 39607.4.

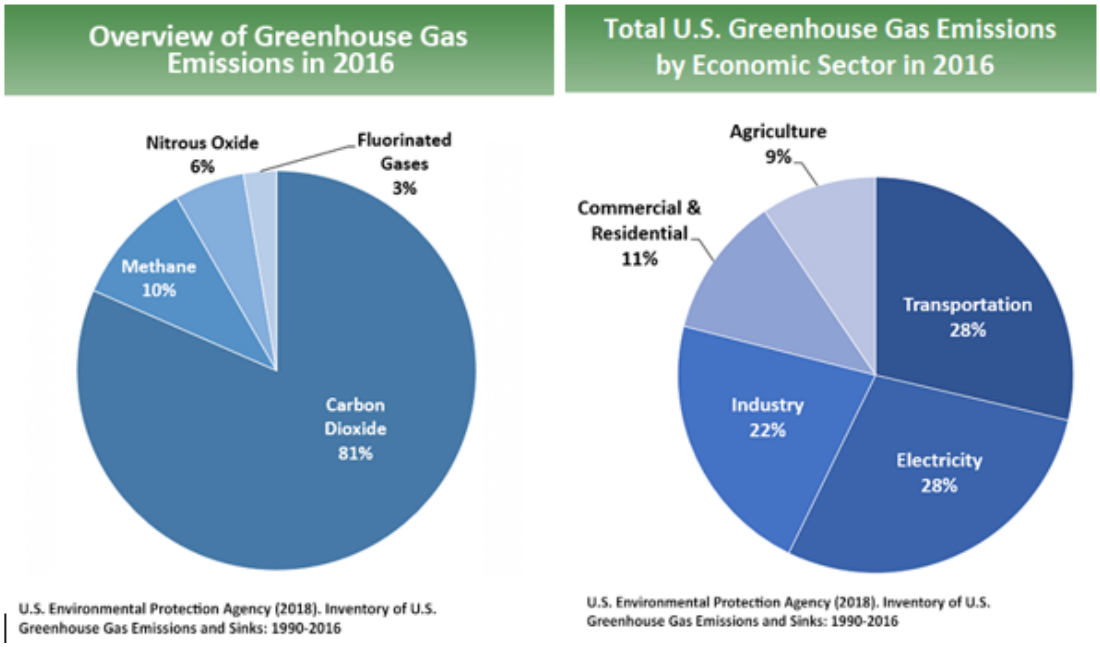
National Greenhouse Gas Inventory

The U.S. Environmental Protection Agency prepares a national greenhouse gas 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 greenhouse gases in the United States, reporting emissions of carbon dioxide, methane,

nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride. It also accounts for emissions of carbon dioxide that are removed from the atmosphere by "sinks" such as forests, vegetation, and soils that uptake and store carbon dioxide (carbon sequestration).

The 1990–2016 inventory found that of 6,511 million metric tons of carbon dioxide equivalent greenhouse gas emissions in 2016, 81 percent consist of carbon dioxide, 10 percent are methane, and six percent are nitrous oxide; the balance consists of fluorinated gases (Source: U.S. Environmental Protection Agency 2018). In 2016, greenhouse gas emissions from the transportation sector accounted for nearly 28.5percent of U.S. greenhouse gas emissions. See Figure 3.1.

Figure 3.1 U.S. 2016 Greenhouse Gas Emissions



State Greenhouse Gas Inventory

The California Air Resources Board collects greenhouse gas 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 greenhouse gas reduction goals. The 2019 edition of the greenhouse gas emissions inventory found total California emissions of 424.1 million metric tons of carbon dioxide equivalent for 2017, with the transportation sector responsible for 41 percent of total greenhouse gases. It also found that overall statewide greenhouse gas emissions declined from 2000 to 2017 despite growth in population and state economic output (Source: California Air Resources Board 2019a). See Figures 3.2 and 3.3.

Figure 3.2 California 2017 Greenhouse Gas Emissions

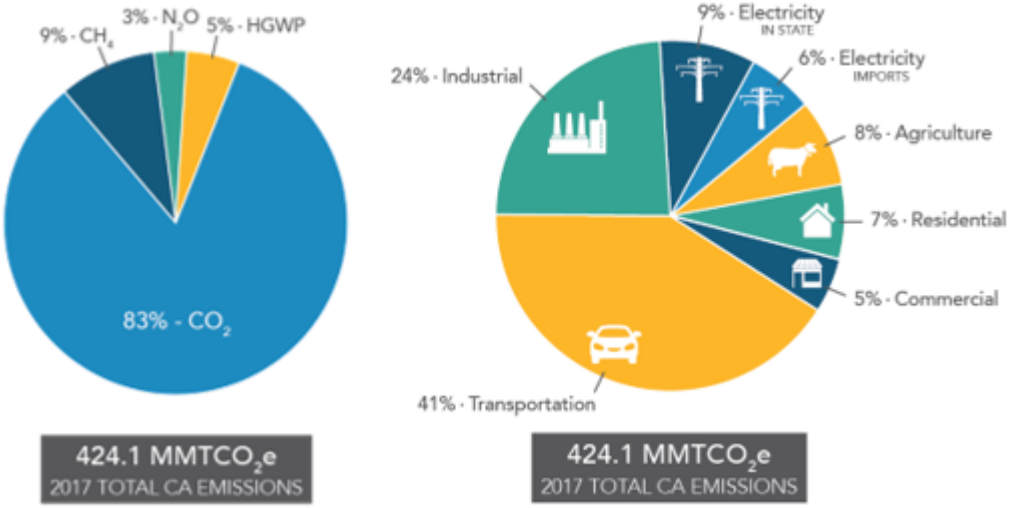
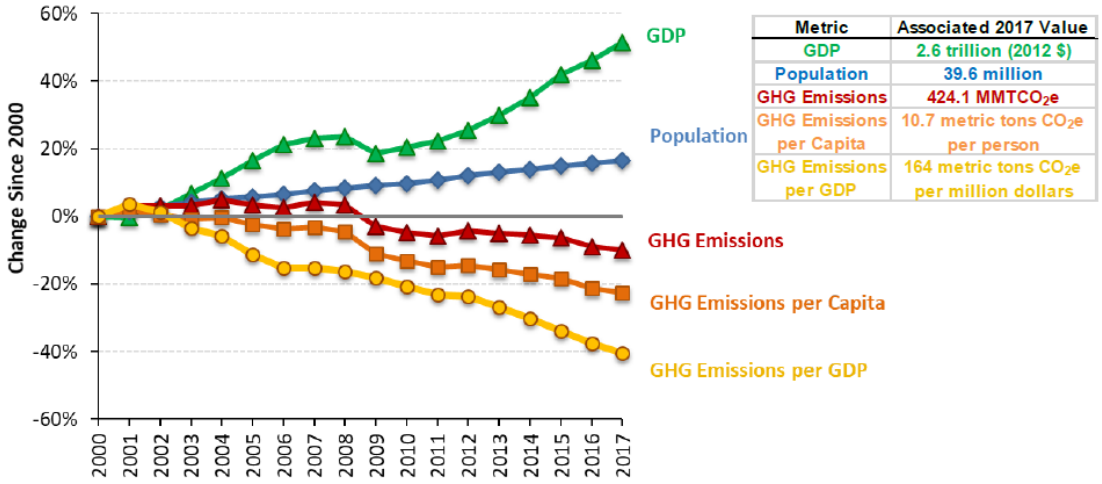


Figure 3.3 Change in California Gross Domestic Product, Population, and Greenhouse Gas Emissions since 2000



Assembly Bill 32 required the California Air Resources Board to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing greenhouse gas emissions to 1990 levels by 2020, and to update it every five years. The California Air Resources Board 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 Executive Order B-30-15 and Senate Bill 32. The Assembly Bill 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce greenhouse gas emissions.

Regional Plans

The California Air Resources Board sets regional targets for California's 18 Metropolitan Planning Organizations to use in their Regional Transportation

Plan/Sustainable Communities Strategy to plan future projects that will cumulatively achieve greenhouse gas reduction goals. Targets are set at a percent reduction of passenger vehicle greenhouse gas emissions per person from 2005 levels. The proposed project is within the jurisdiction of the Santa Cruz County Regional Transportation Commission and the Association of Monterey Bay Area Governments Metropolitan Planning Organization. As of October 1, 2018, the regional average per person reduction targets for the Association of Monterey Bay Area Governments are 3 percent reductionby 2020 and a 6 percent reduction by 2035 (Source: California Air Resources Board 2019c).

The *2040 Santa Cruz County Regional Transportation Plan* (2018) identifies the following goal with several sustainability targets for greenhouse gas reductions that are applicable to this project:

- **Goal**—Establish livable communities that improve people's access to jobs, schools, recreation, healthy lifestyles and other regular needs in ways that improve health, reduce pollution and retain money in the local economy.

Sustainability Targets

- Reduce per capita fuel consumption and greenhouse gas emissions by 1 percent by 2020, 5 percent by 2035, and 6 percent by 2040 through a reduction in vehicle miles traveled and improved speed consistency.
- Improve travel time reliability for vehicle trips.
- Improve multimodal network quality for walk and bicycle trips to and within key destinations.
- Increase the number of active transportation trips by 5 percent of total trips by 2020 and by 18 percent of total trips by 2040.

The *2040 Metropolitan Transportation Plan/Sustainable Communities Strategy and Regional Transportation Plans for Monterey, San Benito and Santa Cruz Counties* "Mitigation Monitoring and Reporting Program" (2018) was prepared by Association of Monterey Bay Area Governments. It recommends that all transportation projects under their jurisdiction, the Transportation Agency for Monterey County, the San Benito Council of Governments, and the Santa Cruz County Regional Transportation Commission shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure where applicable for transportation projects generating construction greenhouse gas emissions:

- **GHG-1 Construction GHG Reduction Measures**. The implementing agency shall incorporate the most recent greenhouse gas reduction measures and/or technologies for reducing diesel particulate and nitrogen oxide emissions measures for off-road construction vehicles during construction. The measures shall be noted on all construction plans and the implementing agency shall perform periodic site inspections. This

measure requires construction plans to ensure that that construction equipment is subject to the California Air Resources Board Regulation for In-use Off-road Diesel Vehicles and, if feasible, construction equipment meets Tier 4 standards; or at least Tier 2 standards; and perform periodic site inspections. While particulate and nitrogen oxides are not greenhouse gases, these standards also help reduce greenhouse gas emissions from construction equipment.

3.3.3 Project Analysis

Greenhouse gas emissions from transportation projects can be divided into those produced during operation of the state highway system and those produced during construction. The main greenhouse gases produced by the transportation sector are carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons. Carbon dioxide emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of methane and nitrous oxide are emitted during fuel combustion. In addition, a small amount of hydrofluorocarbon emissions is included in the transportation sector.

The California Environmental Quality Act Guidelines generally address greenhouse gas emissions as a cumulative impact due to the global nature of climate change (Source: Pub. Resources Code, Section 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" (Source: Cleveland National Forest Foundation v. San Diego Association of Governments (2017) Volume 3 Cal.5th Reporter Series 497, 512.). In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (Source: California Environmental Quality Act Guidelines Sections 15064(h)(1) and 15130).

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

Operational Emissions

The project will not increase roadway capacity or vehicle miles traveled. While some greenhouse gas emissions during the construction period will be unavoidable, the project once completed will not lead to an increase in operational greenhouse gas emissions. It is expected that there will be long-term greenhouse gas benefits as a result of this project by improving the facility such that there are improved traffic flows, smoother pavement surfaces, and reduced lifecycle maintenance costs associated with the facility. These elements are all consistent with reducing operational greenhouse gas emissions.

Construction Emissions

Construction greenhouse gas emissions will result from material processing, onsite construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence will 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 greenhouse gas emissions produced during construction will be offset to some degree by longer intervals between maintenance and rehabilitation activities.

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 Air Resources Board emission reduction regulations. All projects also include Caltrans Standard Specification 14-9.02, Air Pollution Control, which requires contractors to comply with all air-pollution control rules, regulations, ordinances, and statutes, including those of the Monterey Bay Unified Air Pollution Control District.

The project will also implement Caltrans standardized measures (such as construction best management practices) that apply to most or all Caltrans projects. Certain common regulations, such as equipment idling restrictions and development and implementation of a traffic control plan that reduce construction vehicle emissions also help reduce greenhouse gas emissions.

California Environmental Quality Act Conclusion

While the project will result in greenhouse gas emissions during construction, it is anticipated that the project will not result in any increase in operational greenhouse gas emissions. The 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 greenhouse gas-reduction measures, the impact will be less than significant.

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

3.3.4 Greenhouse Gas Reduction Strategies

Statewide Efforts

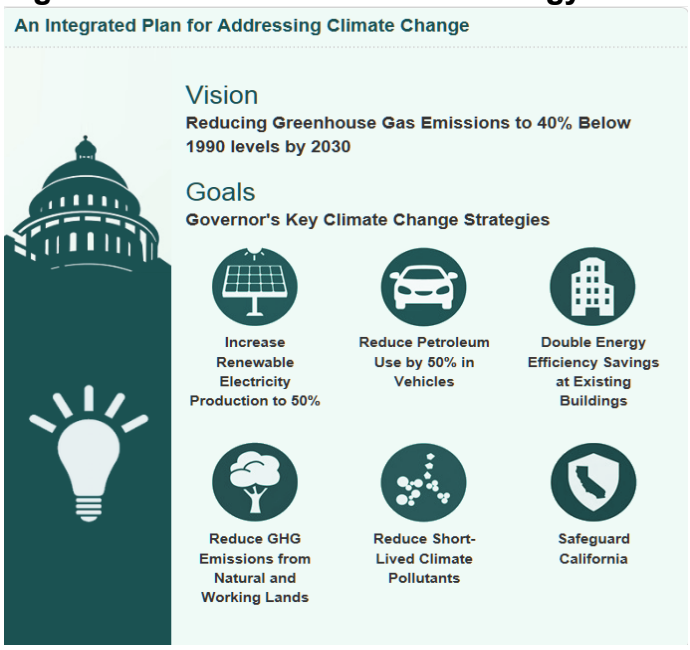
Major sectors of the California economy, including transportation, will need to reduce emissions to meet the 2030 and 2050 greenhouse gas emissions targets. Former Governor Edmund G. Brown Jr. promoted six greenhouse

gas 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*. See Figure 3.4.

The transportation sector is integral to the people and economy of California. To achieve greenhouse gas 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. Greenhouse gas emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. 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 (Source: State of California 2019).

In addition, Senate Bill 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 forest lands, rangelands, farms, and wetlands remove carbon dioxide from the atmosphere through biological processes and sequester the carbon in above-ground and below-ground matter.

Figure 3.4 California Climate Strategy



Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the California Air Resources Board works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in Assembly Bill 32. Executive Order B-30-15, issued in April 2015, and Senate Bill 32 (2016) set an interim target to cut greenhouse gas 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 2040 (also known as CTP 2040)

The California Transportation Plan is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas emissions. In 2016, Caltrans completed the *California Transportation Plan 2040*, which establishes a new model for developing ground transportation systems, consistent with carbon dioxide 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.

Senate Bill 391 (Liu 2009) requires the California Transportation Plan to meet California's climate change goals under Assembly Bill 32. Accordingly, the California Transportation Plan 2040 identifies the statewide transportation system needed to achieve maximum feasible greenhouse gas emission reductions while meeting the state's transportation needs. While Metropolitan Planning Organizations have primary responsibility for identifying land use patterns to help reduce greenhouse gas emissions, the *California Transportation Plan 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 greenhouse gas emissions, among other goals. Specific performance targets in the plan that will help to reduce greenhouse gas emissions include:

- Increasing percentage of non-auto mode share
- Reducing vehicle miles traveled
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) greenhouse gas emissions

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce greenhouse gas 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 Regional Transportation Plan/Sustainable Communities Strategy; contribute to the State's greenhouse gas reduction targets and advance transportation-related greenhouse gas emission reduction project types/strategies; and support other climate adaptation goals (for example, *Safeguarding California*).

Caltrans Policy Directives and Other Initiatives

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

Project-Level Greenhouse Gas Reduction Strategies

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

The contractor will be required to:

- Reduce construction waste and maximize the use of recycled materials.
- Incorporate measures to reduce the use of potable water.
- Seek to operate construction equipment with improved fuel efficiency by:
    - Properly tuning and maintaining equipment
    - Limiting equipment idling time
    - Using the right-size equipment for the job
- Caltrans Standard Specification 14-9.02, Air Pollution Control requires contractors to comply with all air-pollution control rules, regulations, ordinances, and statutes. Measures that reduce construction vehicle emissions also help reduce greenhouse gas emissions.
- Reduce the need for transport of earthen materials by balancing cut and fill quantities.
- Use temporary traffic signals to control the alternating one-way traffic flow during construction to minimize delays and emissions from vehicle idling.
- Replace vegetation removed during project construction with native trees and plants, because vegetation absorbs and sequesters carbon dioxide.

- Maintain pedestrian, bicycle, and transit access throughout construction.

3.3.5 Adaptation

Reducing greenhouse gas 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 variability 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 National Environmental Policy Act assignment, Caltrans is obligated to comply with all applicable federal environmental laws and Federal Highway Administration National Environmental Policy Act 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 (Source: 15 U.S. Code Chapter 56A Section 2921 and the following). 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" (Source: U.S. Global Change Research Program 2018).

The U.S. Department of Transportation 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 the U.S. Department of Transportation 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" (Source: U.S. Department of Transportation 2011).

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

Executive Order 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.

Executive Order 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 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.

Executive Order B-30-15, signed in April 2015, requires state agencies to factor climate change into all planning and investment decisions. This order recognizes that effects of climate change other than sea level rise also threaten California's infrastructure. At the direction of Executive Order 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.

Assembly Bill 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 provide and maintain transportation that meets the needs of all Californians.

Project Adaptation Analysis

The *Caltrans Climate Change Vulnerability Assessments District 5 Technical Report* (2019) was used to develop the Climate Change Adaptation Analysis for this project.

Temperature

The Earth's average surface temperature is rising due to increased concentrations of greenhouse gases in the atmosphere. Temperatures in the west are projected to continue rising and heat waves are expected to become more frequent. The potential effects of extreme temperatures on District 5 assets will vary by asset type and will depend on the specifications used in the original design of the facility. The following have been identified in other U.S. studies as potential impacts of rising temperatures:

- Ground conditions and more/less water saturation can alter the design factors for foundations and retaining walls.
- Temperature may affect expansion/contraction allowances for bridge joints.

- Extended periods of high temperatures could affect safety conditions for employees who work long hours outdoors, such as those working on maintenance activities.
- Right-of-way landscaping and vegetation must survive higher temperatures.
- Extreme temperatures could cause pavement discontinuities and deformation, which could lead to more frequent maintenance.

The project is in a forested coastal mountain region which typically does not experience temperature extremes that could significantly damage pavement. Furthermore, the pavement will likely be replaced due to normal wear before the effects of climate change are felt in the project area. No adaption measures for temperature impacts to pavement due to climate change are necessary for this project.

Sea Level Rise

The two proposed bridges will not be subject to potential sea level rise effects due to their elevation and inland location.

Floodplains Analysis

Most climate scientists predict increased frequency and intensity of rain events related to global climate change, although how frequent and how intense such storms are likely to be is unclear. Transportation assets in California are affected by precipitation in a variety of ways—from inundation/flooding, to landslides, washouts, or structural damage from heavy rain events. Current transportation design uses return period storm events as a variable to include in asset design criteria for bridges and culverts. A return period storm event is the historical intensity of storms based on how often such level of storms have occurred in the past. A 100-year design standard is often applied in the design of transportation facilities and is cited as a design consideration in Section 821.3, Selection of Design Flood, in the Caltrans Highway Design Manual. This metric was analyzed to determine how 100-year storm rainfall is expected to change, using best available precipitation projections available for the state. (Source: 2019 Climate Change Vulnerability Assessment)

The *2019 Caltrans Climate Change Vulnerability Assessments District 5 Technical Report* analyzes potential climate change impacts caused by increased precipitation on a regional scale. The report estimates that the project area's future percentage increase in 100-year storm precipitation depth by 2085, in consideration of the Representative Concentration Pathway 8.5 (High) Emissions Scenario, ranges from 10.0 percent to 14.9 percent. Based on the Federal Emergency Management Agency mapping, at the San Lorenzo River Bridge site, the estimated 2085 100-year precipitation depth could potentially increase from 21 feet to 24.15 feet from river bottom, which would remain below the new bridge abutments and scour protection. At the

Kings Creek Bridge site, the 100-year precipitation depth has not been calculated by the Federal Emergency Management Agency. However, the estimated Ordinary High Water Mark is only a few feet deep. With a 14.9 percent increase in 100-year precipitation depth, it is unlikely that this depth would exceed 5 feet from creek bottom, which would be below the new bridge abutments and scour protection.

Both bridges will be replaced with new single-span structures with higher abutments and less human-made structures in the waterway. This will slightly reduce water surface elevations and improve flood flows at both locations since existing obstructions will be removed and debris will be less likely to be trapped. The San Lorenzo River Bridge will be sloped longitudinally to allow water to flow to either side of the bridge. Scuppers will be added if necessary. The Kings Creek Bridge will retain the existing drainage swales as inlets or replace them with overside drains with 24-inch downdrain pipes. Overside drains will be placed at the south end of the bridge on both sides. New and replaced stormwater drainage systems will be adequately sized to address changes in topography resulting from changes in the bridge profile and associated project features. No further adaptions for increased precipitation impacts due to climate change are necessary for this project.

Wildfire

Increasing temperatures, changing precipitation patterns, and resulting changes to land cover, are expected to affect wildfire frequency and intensity. The proposed project is in a Moderate Fire Hazard Severity Zone (Source: CalFire Santa Cruz County Fire Hazard Severity Zone Map). The models conducted for the *Caltrans Climate Change Vulnerability Assessments District 5 Technical Report* (2019) predict high levels of concern for impacts from wildfires to the route by 2025. The project will include the following adaptations as project features.

- Use firesafe landscaping along roadways to reduce fire danger.
- Remove district assets from the floodway to reduce flooding and debris flow danger from the aftermath of slope fires.
- Require the contractor to use fire-resistant construction materials for roadway features and structures to reduce fire danger.

Caltrans also regularly conducts fuel reduction to create defensible space around highways in fire hazard areas. Caltrans 2018 revised Standard Specification 7-1.02M(2) mandates fire prevention procedures during construction, including a fire prevention plan. The project is not anticipated to exacerbate the impacts of wildfires intensified by climate change.

Climate Change References

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Chapter 4 Comments and Coordination

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

4.1 Cultural Resources and Native American Coordination

Interested Native American representative include individuals and groups identified by the Native American Heritage Commission list as well as individuals who have past involvement in archaeological studies within the immediate vicinity of the project.

- **June 5, 2019**—A request for a search of the Sacred Lands Files was sent to the Native American Heritage Commission.
- **June 7, 2019**—The Native American Heritage Commission stated that a search of their Sacred Lands File failed to indicate the presence of Native American cultural resources in the immediate study area. The Native American Heritage Commission cautioned that lack of information in its files does not preclude the presence of tribal resources, and the Native American Heritage Commission supplied a list of local Native American individuals and/or groups with interest in and knowledge about the area.
- **June 10, 2019**—Caltrans initiated Section 106 and Assembly Bill 52 (Public Resources Code 21080.3.1) consultation and sent out introduction letters to the individual tribal representative provided by the Native American Heritage Commission. The letters inquired if they had any concerns, or if they were open to share any knowledge of cultural resources or properties that can help Caltrans perform more thorough archaeological studies through collaboration. This letter also asked if the copied individual would like to continue correspondence and receive copies of the reports in question. Initial consultation letters were provided to: Valentin Lopez, Chairperson of the Amah Mutsun Tribal Band; Irenne Zwierlein, Chairperson of the Amah Mutsun Tribal Band of Mission San Juan Bautista; Patrick Orozco, Chairman of the Costanoan Ohlone Rumsen-Mutsun Tribe; Ann Marie Sayers, Chairperson of the Indian

Canyon Mutsun Band of Costanoan; and Charlene Nijmeh, Chairperson of the Muwekma Ohlone Indian Tribe of the San Francisco Bay Area.

4.2 Biological Resources Coordination

- **April 22, 2019**—Stephanie Herbert (Caltrans Biologist) emailed Elena Meza (National Marine Fisheries Biologist) to confirm the potential presence of Central California Coast coho salmon in the reaches of the biological studies areas of the San Lorenzo River and Kings Creek. Ms. Herbert also asked Ms. Meza to confirm whether or not Central California Coast Coho Salmon and Central California Coast Steelhead Critical Habitat were present in the biological study areas. Ms. Herbert also explained that BIOS range map for Central California Coast coho salmon displays the known population of the species does not extend as far north as the biological study areas. The 1991 Recovery Plan stated that the population in the San Lorenzo River was at extreme risk of extirpation. The most recent 5-year review for the species, dated 2016, mentioned that the San Lorenzo population had been extirpated. Ms. Herbert also pointed out that there had been reports in 2013 of coho salmon near Henry Cowell State Park near Felton, California. Ms. Herbert asked that Ms. Meza explain the range of coho salmon in the San Lorenzo River, since there were conflicting data in the various publications mentioned above. Ms. Herbert also asked if there were any known barriers to coho salmon passage in the San Lorenzo River.
- **May 7, 2019**—Elena Meza responded to Stephanie Herbert's questions above in an email. She explained that the San Lorenzo River and Kings Creek were both considered Critical Habitat for Central California Coast coho salmon, Central California Coast steelhead, and Essential Fish Habitat for Central California Coast coho salmon. Ms. Meza also explains that Central California Coast coho salmon is likely to be present in the biological study areas based on known occurrences near Felton, California and provided a map of fish barriers between Felton and the biological study areas.
- **May 24, 2019**—Stephanie Hebert generated an official list of threatened and endangered species from the U.S. Fish and Wildlife Service iPaC database and Information Planning and Consultation website.
- **July 19, 2019**—Stephanie Hebert generated an official National Marine Fisheries Service inventory of potentially affected marine species for the project area.
- **September 28, 2020**—Stephanie Hebert generated an official list of threatened and endangered species from the U.S. Fish and Wildlife Service iPaC database and Information Planning and Consultation website and an official National Marine Fisheries Service inventory of potentially affected marine species for the project area.

- ***December 23, 2020—Amanda Ingham (National Marine Fisheries Biologist) provided Caltrans with a signed Biological Opinion for potential effects on threatened Central California Coast steelhead, Central California Coast coho salmon, and designated Critical Habitat for these species in accordance with Section 7 of the Endangered Species Act. In the signed Biological Opinion, the National Marine Fisheries Service concluded that the project is not likely to jeopardize the continued existence of these species; nor is it likely to adversely modify critical habitat. However, the National Marine Fisheries Service expects that take of Central California Coast steelhead and Central California Coast coho salmon may occur. An Incidental Take Statement which applies to this project with non-discretionary terms and conditions was included with the signed Biological Opinion for this project.**

4.3 Community Coordination

- **June 10, 2019**—Caltrans presented the project and scope of work to the Santa Cruz County Regional Transportation Commission Bicycle Advisory Committee. Members of the Committee asked if Caltrans could instead prioritize replacing State Route 9 bridges in more populated areas such as north of the San Lorenzo Valley Unified School District campus. The Committee discussed the two proposed bridge designs and suggested that grade separations on the shoulder, such as rounded shoulders or sidewalks, be considered for pedestrians and inexperienced cyclists. The Committee also expressed concerns with vehicle lane widening causing faster driving and if deemed appropriate, requested to incorporate of signs such as “3 Feet to Pass” and “Bikes May Use Full Lane.”
- **June 11, 2019**—Caltrans presented the project and scope of work to the Santa Cruz County Regional Transportation Commission Elderly and Disabled Transportation Advisory Committee. The Committee members discussed challenges for pedestrians, particularly seniors or people with disabilities, using multiuse shoulders in a rural area. Lighting was suggested along with various striping options, including reflective delineation of two solid lines with crosshatches in the middle, to deter motorists from entering the multiuse shoulder area. A motion was made to support the 8-foot shoulder proposed in the project, provided there was a clear delineation between the travel lane and the multiuse shoulder. The motion passed unanimously.

Chapter 5 List of Preparers

This document was prepared by the following Caltrans staff:

Neal Alie, Professional Engineer, Hydraulics Engineer. Bachelor of Science, Civil Engineering; 33 years of civil engineering experience. Contribution: project preliminary hydraulic evaluations and associated technical report.

Ruben Atilano, Transportation Engineer, Civil. Master of Science, Civil Engineering, California Polytechnic State University, San Luis Obispo. Contribution: project preliminary geotechnical evaluations and associated technical reports for retaining walls.

Kristen Langager, Landscape Architect. Bachelor of Science, Landscape Architecture, California Polytechnic State University, San Luis Obispo; 14 years of landscape architecture experience. Contribution: project visual impact evaluation and associated technical report.

Matt Fowler, Senior Environmental Planner. Bachelor of Arts, Geography/Methods of Geographic Analysis, San Diego State University, San Diego; 19 years of environmental planning experience. Contribution: Oversight of the Initial Study/Mitigated Negative Declaration and Environmental Assessment.

Stephanie Herbert, Associate Environmental Planner. Bachelor of Science, Ecology, Evolution, and Biodiversity, Minor in Wildlife, Fish, and Conservation Biology; University of California, Davis; 6 years of experience in botany, wildlife biology, and restoration ecology. Contribution: biological field surveys, agency coordination, Natural Environment Study, and Biological Assessment.

Michael Hollier, Associate Environmental Planner (Generalist). Bachelor of Arts, History, University of Louisiana at Lafayette; 14 years of transportation, land use, and environmental planning experience. Contribution: Initial Study/Mitigated Negative Declaration and Environmental Assessment, and technical report coordination.

Joseph Klamecki, Engineering Geologist. Bachelor of Science, Geology, Humboldt University, Arcata; 12 years of geotechnical design experience. Contribution: project preliminary geotechnical evaluations and associated technical reports for Kings Creek Bridge replacement.

Lindsay Kozub, Associate Environmental Planner (Architectural Historian). Master of Arts, History/Cultural Resource Management, Colorado State University; Bachelor of Arts, History, University of Montana;

Bachelor of Science, Business, Montana State University; 10 years of experience in historical and architectural documentation, historic preservation, and cultural resource management. Contribution: project historic architectural evaluation and associated technical reports.

Isaac Levya, Engineering Geologist. Bachelor of Science, Geology, California State University, Bakersfield; over 30 years of experience in petroleum geology, environmental geology, and geotechnical engineering. Contribution: project hazardous waste, paleontology, and water quality evaluations and associated technical reports and memorandums.

Ryan McKee, Professional Geologist, Engineering Geologist. Master of Science, Geology, San Jose State University; Bachelor of Science, Earth Science, California Polytechnic State University, San Luis Obispo; 9 years of experience in environmental and engineering geology. Contribution: project preliminary geotechnical evaluations and associated technical reports for retaining walls.

Karl Mikel, Professional Engineer, Qualified Storm Water Prevention Plan Developer, Environmental Engineering Branch Chief. Bachelor of Sciences, Environmental Engineering, Cal Poly San Luis Obispo; Master of Sciences, Civil/Environmental Engineering, Cal Poly San Luis Obispo; 17 years of experience in environmental engineering. Contribution: project air quality, noise, and greenhouse gas emissions evaluations and associated technical memorandum.

Alvin S. Rosa-Figueroa, Environmental Planner (Archaeology). Bachelor of Science, Anthropology, University of California, Riverside; 7 years of Prehistoric Central American and California Anthropology/Archaeology/Ethnology experience; 3 years of Cultural Resource Management and 5 months of environmental planning experience. Contribution: project archaeological evaluation, Native American tribal consultation, and associated technical reports.

Chapter 6 Distribution List

United States Fish and Wildlife Service—Ventura Office
2493 Portola Road, Suite B
Ventura, California 93003

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service—West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4250

Department of the Army
San Francisco District, Corps of Engineers
Regulatory Division
450 Golden Gate Ave., 4th Floor
San Francisco, California 94102-3404

California Department of Fish and Wildlife
Bay Delta Region 3
2825 Cordelia Road, Suite 100
Fairfield, CA 94534

Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401

County of Santa Cruz Planning Department
701 Ocean Street
Santa Cruz, CA 95060

Santa Cruz County Sheriff's Office
Sheriff Headquarters
5200 Soquel Avenue
Santa Cruz, CA 95062

Santa Cruz METRO
Administrative Offices
110 Vernon Street
Santa Cruz, CA 95060

Boulder Creek Fire Protection District
13230 Central Avenue
Boulder Creek, CA 95006

Appendix A Title VI Policy Statement

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY Gavin Newsom, Governor

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November 2019

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

Toks Omishakin
Director

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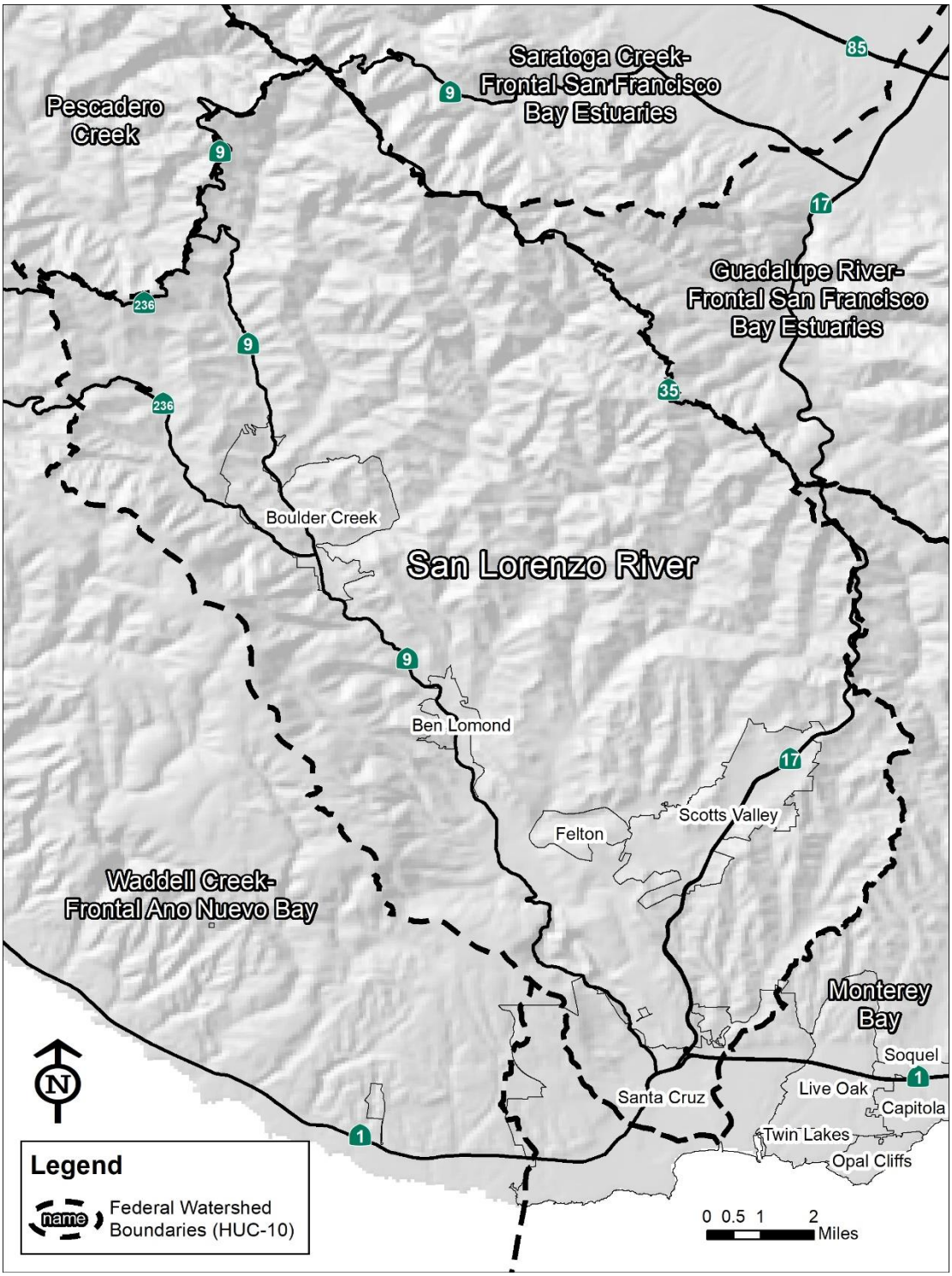
Appendix B San Lorenzo River Watershed



Appendix C Avoidance, Minimization and/or Mitigation Summary

To ensure 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] that follows) will 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 the Environmental Commitments Record are fulfilled. Following construction and appropriate phases of project delivery, long-term mitigation maintenance and monitoring will take place, as applicable.

Note: Some measures may apply to more than one resource area. Duplicated or redundant measures have not been included in this summary.

Caltrans Standard Specifications and Special Provisions

This project contains standardized project measures (Caltrans Standard Specifications and Special Provisions) that are used on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the proposed project. These measures are included as project features and addressed in more detail in the Environmental Consequences sections found in Chapter 2 when appropriate.

- 7-1.01 (Legal Relations and Responsibility to the Public—General)
- 7-1.01G (Water Pollution)
- 7-1.02K(6)(j)(ii) (Lead Compliance Plan)
- 7-1.02K(6)(j)(iii) (Earth Material Containing Lead)
- 7-1.03 (Public Convenience)
- 10-5 (Dust Control)
- 12-1 through 12-7 (Temporary Traffic Control)
- 14-2.03A (Archaeological Resources—General)
- 14-6.04 (Wetland Protection)
- 14-8.02 (Noise Control)
- 14-9.02 (Air Pollution Control)
- 14-10.01 (Solid Waste Disposal and Recycling—General)
- 14-10.02 (Solid Waste Disposal and Recycling Report)

- 14-11 (Hazardous Waste and Contamination)
- 14-11.13B(2) (Debris Containment and Collection Plan)
- 84-9.03C (Remove Traffic Stripes and Pavement Markings Containing Lead)
- A Transportation Management Plan will be prepared for the project.

Aesthetic/Visual (Sections 2.1.2 and 3.2.1)

The following context sensitive measures will be implemented to avoid and minimize project impacts to visual resources and ensure that the project will be consistent with local scenic values along State Route 9.

- **Construction Access Roads**—Following construction, the contractor will regrade and recontour, as necessary, any construction access roads, staging areas, and other temporary uses created for the project to match the surrounding natural topography along State Route 9 in order to avoid unnatural-appearing remnant landforms.
- **Concrete Bridge Rails and Barriers**—Concrete bridge rails and barriers will be aesthetically treated to visually recede and appear more consistent with the natural, wooded character of the setting. The aesthetic treatment will be developed and approved by California Department of Transportation Structure Design in conjunction with District 5 Landscape Architecture Branch.
- **Bicycle and Pedestrian Rails**—Metal bicycle and/or pedestrian rail associated with the concrete bridge rail will be darkened or stained to minimize contrast and noticeability. The color will be developed and approved by California Department of Transportation Structure Design in conjunction with California Department of Transportation District 5 Landscape Architecture Branch.
- **Metal Roadside Elements**—All metal roadside elements like guardrails, transitions, end treatments, and cable safety railings will be stained or darkened to be visually compatible with the rural setting. The color will be determined and approved by California Department of Transportation District 5 Landscape Architecture Branch.
- **Landscape Vegetation**—Replacement vegetation plantings will include aesthetic considerations as well as the inherent biological goals. Revegetation will include native trees and plants as determined by the California Department of Transportation District 5 Biology and Landscape Architect Branches. Revegetation will occur at the maximum extent horticulturally viable. Planting will be maintained until established.

Biological Resources—Natural Communities

Measures identified in Section 2.3.2 (Wetlands and Other Waters) for contour restoration and Section 2.3.5 (Invasive Species) for revegetation plans will minimize impacts to natural communities. Compensatory mitigation for natural

communities is not necessary because the project will only temporarily impact natural communities and will ultimately result in a net-benefit from the removal of piers. The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to natural communities.

Biological Resources—Wetlands and Other Waters

Impacts to jurisdictional areas within the project work area are necessary to provide work areas and access areas to the San Lorenzo and Kings Creek Bridges. All temporary impacts will be restored. Compensatory mitigation for permanent impacts to jurisdictional areas is not expected because the project will only temporarily impact jurisdictional areas and will ultimately result in a net-benefit from removal of the two pier columns. The following measures will be implemented and included as California Environmental Quality Act mitigation to avoid and minimize potential impacts to jurisdictional areas resulting from the project:

- **Environmentally Sensitive Area Fencing CEQA Mitigation**—Prior to any ground-disturbing activities, temporary environmentally sensitive area fencing will be installed around jurisdictional resources and all work limits, to ensure no impacts occur outside the project limits. Environmentally sensitive areas will be included on design plans and delineated in the field prior to the start of construction activities.
- **Hazardous Materials Spills CEQA Mitigation**—During construction, all project-related hazardous materials spills within the project site will be cleaned up immediately. The contractor will be required to always keep readily accessible spill prevention and cleanup materials on site during construction.
- **Erosion Control CEQA Mitigation**—During construction, the contractor will implement erosion control measures. Temporary Large Sediment Barriers and fiber rolls will be installed as needed between the project site and jurisdictional waters and riparian habitat. ***The contractor will be prohibited from using synthetic geotextiles material and synthetic filter fabrics for erosion control.**
- **Vehicle Cleaning and Refueling CEQA Mitigation**—During construction, the cleaning and refueling of equipment and vehicles will occur only within a designated staging area. This area will either be a minimum of 100 feet from jurisdictional areas or surrounded by barriers (for example, fiber rolls or equivalent) if it is less than 100 feet from aquatic areas. The staging areas will conform to Caltrans 2017 Construction Site Best Management Practices.
- **Contour Restoration CEQA Mitigation**—Each season after construction has been completed in jurisdictional areas, contours will be restored as close as possible to their original condition.

Biological Resources—Animal Species

California Giant Salamander and Santa Cruz Black Salamander

The avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing and in Section 2.3.4 (Threatened and Endangered Species) for worker education programs proposed to protect Central California Coast Coho Salmon Critical Habitat apply to California giant salamander and Santa Cruz black salamander as well. These and the following measures will be implemented and included as California Environmental Quality Act mitigation to avoid and minimize potential impacts to California giant salamander and Santa Cruz black salamander resulting from the project:

- **Preconstruction Surveys CEQA Mitigation**—Preconstruction surveys for salamanders will occur before construction begins. If individuals are found, salamanders, larvae, and eggs will be relocated outside the project footprint in suitable habitat.
- **Initial Ground Disturbance CEQA Mitigation**—California Department of Transportation-approved biologist(s) will be present during initial ground disturbance to monitor debris removal and relocate any salamanders that are found during preconstruction surveys.
- **Exclusion Fencing CEQA Mitigation**—Prior to dewatering/diversion of the Kings Creek and the San Lorenzo River, the contractor will install exclusion fencing to keep all salamanders from entering the project areas.
- **Aquatic Salamander Relocation CEQA Mitigation**—As dewatering occurs in the San Lorenzo River and Kings Creek, California Department of Transportation-approved biologist(s) will be present to relocate all aquatic salamanders, larvae, and eggs from the diversion footprint. Salamanders will be identified and relocated to suitable habitat outside the exclusion fence.
- **Habitat Restoration CEQA Mitigation**—All woody debris and large boulders will be stockpiled and replaced on site after construction. After construction, all vegetation removed will be replaced in coordination with a qualified biologist to provide suitable habitat for California giant salamander and Santa Cruz black salamander.

Compensatory mitigation is not expected because the project will only temporarily impact salamander species and their habitat.

American Peregrine Falcon, Osprey, and Other Nesting and Migratory Birds

The avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing and in Section 2.3.4 (Threatened and Endangered Species) worker education programs proposed to protect Central California Coast Coho Salmon Critical Habitat apply to American peregrine falcon, osprey, and other native and

migratory birds as well. The following measures will also be implemented and included as California Environmental Quality Act mitigation to avoid and minimize potential impacts to American peregrine falcon, osprey, and other native and migratory birds resulting from the project:

- **Vegetation Removal CEQA Mitigation**—If feasible, vegetation removal and tree trimming shall be scheduled to occur between October 1 and January 31, outside of the typical nesting bird season, which is February 1 to September 30.
- **Nesting Bird Preconstruction Survey CEQA Mitigation**—If vegetation removal or other construction activities are proposed to occur during the nesting season (February 1 to September 30), then a nesting bird survey will be conducted by a California Department of Transportation biologist no more than 14 days prior to removal or construction.
- **Active Nest Buffer CEQA Mitigation**—If an active bird nest is found, a qualified biologist will determine an appropriate Environmentally Sensitive Area buffer (typically 100 feet around active perching bird nests and 500 feet for active bird of prey or raptor nests) or monitoring strategy based on the habits and needs of the species. The buffer area will be avoided, or a monitoring strategy will be implemented until a California Department of Transportation biologist has determined that juveniles have fledged.
- **Tree Protection CEQA Mitigation**—Trees to be removed will be noted on design plans. Prior to any ground-disturbing activities, high-visibility fencing or flagging will be installed around the dripline of trees to be protected within the project limits.
- **Rodent Control Restrictions CEQA Mitigation**—To avoid secondary poisoning of raptors that hunt and feed on rodents and other small animals, no rodent control pesticides will be used in the project area, including anticoagulant rodenticides such as brodifacoum, bromadiolone, difethialone and difenacoum.

Compensatory mitigation is not expected because the project will only temporarily impact American peregrine falcon, osprey, and other nesting and migratory bird habitat which will be replaced after the new bridges are completed.

Biological Resources—Threatened and Endangered Species

Essential Fish Habitat

Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration, and in Section 2.3.4 (Threatened and Endangered Species) for worker education programs, migration period, in-stream work, dewatering, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring proposed to protect Central California Coast Coho

Salmon Critical Habitat are also applicable to federally designated Essential Fish Habitat for Central California Coast coho salmon. In addition, the following measure is proposed to further minimize temporary impacts to Essential Fish Habitat and is included as a California Environmental Quality Act mitigation measure for impacts to Central California Coast coho salmon Evolutionary Significant Unit and Central California Coast steelhead Distinct Population Segment:

- **Vegetation Replacement CEQA Mitigation**—All cut banks, road fills, bare shoulders, disturbed streambanks, and other similar disturbed areas in the riparian areas will be revegetated after construction to prevent erosion. All and sediment control and retention structures will be checked throughout the rainy season during construction and the plant establishment period.

Compensatory mitigation is not expected because the project will only temporarily impact Essential Fish Habitat and the compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to Essential Fish Habitat.

Central California Coast Coho Salmon Critical Habitat

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast Coho Salmon Critical Habitat, which are included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration, and in Section 2.3.4 (Threatened and Endangered Species) for vegetation removal proposed to protect Essential Fish Habitat for Central California Coast coho salmon apply to federally designated Critical Habitat for the Central California Coast Coho salmon. In addition, the following measures are proposed to further minimize the impacts to Central California Coast Coho Salmon Critical Habitat and are included as California Environmental Quality Act mitigation measures for impacts to Central California Coast coho salmon Evolutionary Significant Unit and Central California Coast steelhead Distinct Population Segment:

- **Worker Education Program CEQA Mitigation**—Prior to vegetation removal, construction, and initiation of any stream diversion/dewatering activity, a qualified biologist will conduct a worker environmental training programs for all workers on site. The worker education program will include a description of protected species and habitats, their legal/protected status, proximity to the project site, avoidance/minimization measures to be implemented during the project, and the implications of

violating the federal Endangered Species Act and other relevant permit conditions.

- **Migration Period CEQA Mitigation**—To avoid impacts to Critical Habitat, all work will be completed outside of the anticipated migration period for threatened and endangered fish species, through coordination with National Marine Fisheries Service and the California Department of Fish and Wildlife Service.
- **In-stream Work CEQA Mitigation**—During construction, in-stream work will be limited to June 1 and October 31, during the period of seasonally lower water levels. Deviations from this work window will only be made with concurrence from the Department of Transportation biologist and regulatory resource agencies.
- **Dewatering CEQA Mitigation**—Dewatering/diversion will be performed according to Caltrans Construction Site Best Management Practices (2017), and upstream and downstream passage of adult and juvenile fish will be maintained at all times, according to current National Marine Fisheries Service guidelines and criteria (2001). ***The Contractor will use fire-resistant materials for stream dewatering/diversion, when feasible.**
- **In-Channel Structure Removal CEQA Mitigation**—Immediately upon completing in-channel work, the contractor will work with a qualified biologist to ensure that all in-channel structures will be removed in a manner that minimizes disturbance to downstream flows and water quality.
- **Site Restoration CEQA Mitigation**—After site construction activities are completed, the contractor will remove all temporary excavations and fills within the project limits in their entirety and return the affected areas to preconstruction elevations.
- **Biological Monitoring CEQA Mitigation**—A qualified biological monitor will monitor erosion and sediment controls to identify and correct any conditions that could adversely affect threatened or endangered species or their Critical Habitat. The biological monitor will be granted the authority to halt work activity as necessary and to recommend measures to avoid/minimize adverse effects to threatened or endangered species or their Critical Habitat.
- **Tree and Shrub Replacement CEQA Compensatory Mitigation**—All tree and shrub removal will be replaced after construction work is completed to replace riparian habitat as quickly as possible. All tree and shrub removal will be replaced after construction work is completed to replace riparian habitat as quickly as possible. Within the riparian zone, non-native trees that are removed will be replaced with native trees at a minimum 1:1 ratio and native trees will be replaced at minimum a 3:1 ratio. This ratio may increase as required by regulatory agency permit conditions. A mitigation and monitoring plan will be used to ensure

restoration of the disturbed riparian corridor will occur. Replacement plants, erosion control material, native seed mixtures, and an invasive weed treatment plan will be described in detail in in the mitigation and monitoring plan. The final mitigation and monitoring plan will be consistent with the agency requirements as written in the 404, 401, and 1602 permits and will be reviewed and approved through the regulatory review process.

No additional compensatory mitigation is expected because the project will only temporarily impact Central California Coast Coho Salmon Critical Habitat and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

Central California Coast Steelhead Critical Habitat

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast Steelhead Critical Habitat, which are included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration, and in Section 2.3.4 (Threatened and Endangered Species) for vegetation removal proposed to protect Essential Fish Habitat for Central California Coast Coho Salmon apply to federally designated Critical Habitat for the Central California Coast steelhead. The Central California Coast Coho Salmon Critical Habitat avoidance and minimization measures in Section 2.3.4 which are proposed for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring will also be implemented to avoid and minimize potential adverse impacts to California Central Coast Steelhead Critical Habitat. Compensatory mitigation is not expected because the project will only temporarily impact Central California Steelhead Critical Habitat areas and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

Central California Coast Coho Salmon Evolutionary Significant Unit

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast coho salmon, which are included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration, and in Section 2.3.4 (Threatened and Endangered Species) for vegetation removal proposed to protect Essential Fish Habitat for Central California Coast coho salmon apply to Central California Coast coho

salmon Evolutionary Significant Unit. The Central California Coast Coho Salmon Critical Habitat avoidance and minimization measures in Section 2.3.4 which are proposed for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring will also be implemented to avoid and minimize potential adverse impacts to Central California Coast coho salmon Evolutionary Significant Unit. In addition, the following measures are proposed to further minimize the impacts to Central California Coast coho salmon Evolutionary Significant Unit.

- **Biological Monitoring and Fish Relocation CEQA Mitigation**—California Department of Transportation-approved biologist(s) with experience in coho salmon biology and ecology, aquatic habitats, biological monitoring (including diversion and dewatering), and capturing, handling, and relocating fish species will be retained for the project. During in-stream work, the biologist(s) will continuously monitor placement and removal of any required stream diversions to capture stranded steelhead and other native fish species and relocate them to suitable habitat as appropriate. The biologist(s) will capture coho salmon stranded as a result of diversion/dewatering and relocate coho salmon to suitable in-stream habitat outside of the work area, using methods approved by the appropriate regulatory agencies, which may include providing aerated water in buckets for transport and ensuring adequate water temperatures during transport. The biologist(s) will note the number of coho salmon observed in the affected area, the number relocated, and the date and time of the collection and relocation. The biologist(s) will monitor erosion and sediment controls to identify and correct any conditions that could adversely affect coho salmon or their habitat. The biologist(s) will be granted the authority to halt work activity as necessary and to recommend measures to avoid/minimize adverse effects to coho salmon and their habitat.
- **Dewatering Pumps CEQA Mitigation**—During in-stream work, if pumps are incorporated to assist in temporarily dewatering the site, intakes will be completely screened with no larger than 3/32-inch (2.38-millimeter) wire mesh to prevent coho salmon and other sensitive aquatic species from entering the pump system. Pumps will release the additional water to a settling basin or tan, allowing the suspended sediment to settle out prior to re-entering the stream(s) outside of the isolated area. The form and function of all pumps used during the dewatering activities will be checked daily, to ensure a dry work environment and minimize adverse effects to aquatic species and habitats.

The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to Central California Coast coho salmon Evolutionary Significant Unit. No additional compensatory mitigation is expected because the project will only temporarily impact Central California Coast coho salmon

Evolutionary Significant Unit and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

Central California Coast Steelhead Distinct Population Segment

***The project will comply with the terms and conditions of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service for Central California Coast steelhead, which are included in Appendix G (Biological Opinion and Incidental Take Statement) of this document.** Avoidance and minimization measures identified in Section 2.3.2 (Wetlands and Other Waters) for environmentally sensitive area fencing, hazardous materials spills, erosion control, vehicle cleaning and refueling, and contour restoration, and in Section 2.3.4 (Threatened and Endangered Species) for vegetation removal proposed to protect Essential Fish Habitat for Central California Coast coho salmon apply Central California Coast steelhead Distinct Population Segment. The Central California Coast Coho Salmon Critical Habitat avoidance and minimization measures in Section 2.3.4 which are proposed for worker training, migration periods, in-stream work, dewatering, erosion control, in-channel structure removal, site restoration, tree and shrub replacement, and biological monitoring will also be implemented to avoid and minimize potential adverse impacts to Central California Coast steelhead Distinct Population Segment. Furthermore, avoidance and minimization measures identified in Section 2.3.4 for biological monitoring and fish relocation, and for dewatering pumps apply to Central California Coast steelhead Distinct Population Segment. In addition, the following measure is proposed to further minimize the impacts to Central California Coast steelhead Distinct Population Segment.

The compensatory mitigation for tree and shrub replacement to mitigate impacts to Central California Coast Coho Salmon Critical Habitat will also minimize impacts to Central California Coast steelhead Distinct Population Segment. No additional compensatory mitigation is expected because the project will only temporarily impact Central California Coast steelhead Distinct Population Segment and will ultimately result in a net-benefit for the species as they will gain 0.0005 acre (22 square feet) of streambed habitat.

Invasive Species

The following avoidance and minimization measures will be implemented for to limit the introduction and spread of invasive species within the project sites:

- **Invasive Plant Avoidance**—During construction, the California Department of Transportation will ensure that the spread or introduction of invasive exotic plant species will be avoided to the maximum extent possible.
- **Imported Fill**—If the use of imported fill material is necessary, the imported material will be obtained from a source that is known to be free

of invasive plant species or the material will consist of purchased clean material, such as crushed aggregate, sorted rock, or similar.

- **Revegetation Plans CEQA Mitigation**—Project plans will avoid the use of plant species that the California Invasive Plant Council, California Department of Agriculture, California Department of Fish and Wildlife, or other resource organization considers to be invasive or potentially invasive.

Temporary Construction Impacts

Noise—Equipment Noise Control

The following control measures will be implemented to minimize noise and vibration during periods of construction:

- **Equipment Shielding**—The Contractor will shield especially loud pieces of stationary construction equipment.
- **Equipment Location**—The Contractor will locate portable generators, air compressors, etc., as far away from sensitive noise receptors as feasibly possible and limit grouping major pieces of equipment operating in one area to the greatest extent feasible.
- **Heavy Traffic Areas**—The Contractor will place heavily trafficked areas such as the maintenance yard, equipment, tool, and other construction-oriented operations in locations that will be the least disruptive to surrounding sensitive noise receptors.
- **Equipment Noise Abatement**—The Contractor will use newer equipment that is quieter and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Internal combustion engines used for any purpose on or related to the job will be equipped with a muffler or baffle of a type recommended by the manufacturer.
- **Nighttime Construction**—The Resident Engineer will ensure that whenever possible construction work will be done during the day, especially when work is near sensitive receptors. If nighttime construction activities are necessary, the noisiest construction activities will be done nearest the residences as early in the evening as possible.

Noise - Administrative Measures

- **Public Notice**—The California Department of Transportation will notify surrounding residents and the public in advance of the construction schedule when construction noise and upcoming construction activities likely to produce an adverse noise environment are expected. This notice will be given two weeks in advance. Notice will be published in local news media of the dates and duration of proposed construction activity. The District 5 Public Information Office will post notice of the proposed

construction and potential community impacts after receiving notice from the Resident Engineer.

- **Noise Complaints**—The Resident Engineer will consult with District 5 Noise staff to determine appropriate steps to alleviate noise-related concerns if complaints are received during the construction process.

Appendix D Glossary of Technical Terms

abutment—the part of a structure (such as an arch or a bridge) that directly receives thrust or pressure (Source: Merriam-Webster)

aesthetics—a pleasing experience of effect (Source: Merriam-Webster); visual resources under the California Environmental Quality Act

alluvium—clay, silt, sand, gravel, or similar loose rock fragments or organic materials deposited by running water (Source: Merriam-Webster)

anadromous species—fish that migrate from saltwater to freshwater to spawn (Source: National Oceanic and Atmospheric Administration National Marine Sanctuaries Fisheries Glossary – Voices of the Bay)

bent—a framework (as in a bridge) to carry lateral as well as vertical loads (Source: Merriam-Webster)

cold plane—also known as milling, is the construction process that removes portions of the asphalt pavement surface to the depth needed for the operations (Source: Federal Highway Administration "Overview of Project Selection Guidelines for Cold In-place and Cold Central Plant Pavement Recycling")

effluent—waste material (such as smoke, liquid industrial refuse, or sewage) discharged into the environment especially when serving as a pollutant (Source: Merriam-Webster)

ephemeral—lasting a very short time (Source: Merriam-Webster)

exacerbation—the act of making more violent, bitter, or severe (Source: Merriam-Webster)

excavation—the action or process of forming a cavity by cutting, digging, or scooping (Source: Merriam-Webster)

fingerling—a small fish especially up to one year of age (Source: Merriam-Webster)

fry—young fish, especially when it is newly hatched (Source: National Oceanic and Atmospheric Administration National Marine Sanctuaries Fisheries Glossary – Voices of the Bay)

estuarine—relating to an estuary, the wide part of a river at the place where it joins the ocean (Source: Cambridge Dictionary)

gradient—a part sloping upward or downward (Source: Merriam-Webster)

hydroacoustic—of or relating to the transmission of sound in water (Source: Merriam-Webster)

hydraulics—a branch of science that deals with practical applications (such as the transmission of energy or the effects of flow) of liquid (such as water) in motion (Source: Merriam-Webster)

hydrology—a science dealing with the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere (Source: Merriam-Webster)

hydrophytic—a plant that grows either partly or totally submerged in water (Source: Merriam-Webster)

impervious—not allowing entrance or passage of fluids (Source: Merriam-Webster)

larvae—the early form of an animal (such as a frog or sea urchin) that at birth or hatching is fundamentally unlike its parent and must metamorphose before assuming the adult characters (Source: Merriam-Webster)

liquefaction—process by which water-saturated sediment temporarily loses strength and acts as a fluid, like when you wiggle your toes in the wet sand near the water at the beach (Source: U.S. Geologic Survey Earthquake Glossary)

palliative—something that reduces intensity of (Source: Merriam-Webster)

perennial stream—A stream that normally has water in its channels at all times (Source: United States Geologic Service National Water-Quality Assessment Project Glossary)

perforated manifold—a pipe or connected system of pipes with multiple drainage holes to distribute collected runoff or groundwater evenly throughout an infiltration area (Source: U.S. Environmental Protection Agency *Storm Water Technology Fact Sheet: Infiltration Drainfields*, September 1999)

precipitation—a deposit on the earth of hail, mist, rain, sleet, or snow; the quantity of water deposited (Source: Merriam-Webster)

probabilistic—of, relating to, or based on the chance that a given event will occur (Source: Merriam-Webster)

probability—the chance that a given event will occur (Source: Merriam-Webster)

rear—to bring to maturity or self-sufficiency usually through nurturing care (Source: Merriam-Webster)

riffle—a shallow extending across a streambed and causing broken water (Source: Merriam-Webster)

riparian—relating to or living or located on the bank of a natural watercourse (such as a river) or sometimes of a lake or a tidewater (Source: Merriam-Webster)

riverine—relating to, formed by, or resembling a river (Source: Merriam-Webster)

scour—erosion caused by the change of direction and acceleration of water after passing an obstruction in the waterway (Source: Federal Emergency Management Agency "Erosion, Scour, and Foundation Design")

seismogenic—capable of generating earthquakes (Source: U.S. Geologic Survey Earthquake Glossary)

sole source aquifer—body of permeable rock which can contain or carry groundwater that supplies at least 50 percent of the drinking water for its service area, and there are no reasonably available alternative drinking water sources should the aquifer become contaminated. (Source: U.S. Environmental Protection Agency)

spawn—*noun*, the eggs of aquatic animals (such as fishes or oysters) that lay many small eggs; *verb*, to deposit or fertilize spawn (Source: Merriam-Webster)

smolt—a young salmon or sea trout near two years old that is at the stage of development when it assumes the silvery color of the adult and is ready to migrate to the sea (Source: Merriam-Webster)

stratum, strata (plural)—one of a series of layers, levels, or gradations in an ordered system (Source: Merriam-Webster)

substrate—sediment, hard bottom, structures underlying the waters, and associated biological communities (Source: National Oceanic and Atmospheric Administration National Marine Sanctuaries Fisheries Glossary – Voices of the Bay)

turbidity—reduced clarity of surface water because of suspended particles, usually sediment (Source: U.S Geologic Survey National Water-Quality Assessment Project Glossary)

watershed—a region or area bounded on the edge by a divide and draining ultimately to a particular watercourse or body of water (Source: Merriam-Webster)

weir—a dam in a stream or river to raise the water level or divert its flow (Source: Merriam-Webster)

Appendix E Special Status Species Lists

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish And Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003-7726
Phone: (805) 644-1766 Fax: (805) 644-3958

In Reply Refer To:
Consultation Code: 08EVEN00-2020-SLI-0650
Event Code: 08EVEN00-2020-E-01406
Project Name: San Lorenzo and Kings Creek Bridge

September 28, 2020

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 list identifies species listed as threatened and endangered, species proposed for listing as threatened or endangered, designated and proposed critical habitat, and species that are candidates for listing that may occur within the boundary of the area you have indicated using the U.S. Fish and Wildlife Service's (Service) Information Planning and Conservation System (IPaC). The species list fulfills the requirements under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the species list should be verified after 90 days. We recommend that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists following the same process you used to receive the enclosed list. Please include the Consultation Tracking Number in the header of this letter with any correspondence about the species list.

Due to staff shortages and excessive workload, we are unable to provide an official list more specific to your area. Numerous other sources of information are available for you to narrow the list to the habitats and conditions of the site in which you are interested. For example, we recommend conducting a biological site assessment or surveys for plants and animals that could help refine the list.

If a Federal agency is involved in the project, that agency has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a major construction project*, the Federal agency has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If the Federal agency determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to a

written request for formal consultation. During this review process, the Federal agency may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

Federal agencies are required to confer with the Service, pursuant to section 7(a)(4) of the Act, when an agency action is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10(a)). A request for formal conference must be in writing and should include the same information that would be provided for a request for formal consultation. Conferences can also include discussions between the Service and the Federal agency to identify and resolve potential conflicts between an action and proposed species or proposed critical habitat early in the decision-making process. The Service recommends ways to minimize or avoid adverse effects of the action. These recommendations are advisory because the jeopardy prohibition of section 7(a)(2) of the Act does not apply until the species is listed or the proposed critical habitat is designated. The conference process fulfills the need to inform Federal agencies of possible steps that an agency might take at an early stage to adjust its actions to avoid jeopardizing a proposed species.

When a proposed species or proposed critical habitat may be affected by an action, the lead Federal agency may elect to enter into formal conference with the Service even if the action is not likely to jeopardize or result in the destruction or adverse modification of proposed critical habitat. If the proposed species is listed or the proposed critical habitat is designated after completion of the conference, the Federal agency may ask the Service, in writing, to confirm the conference as a formal consultation. If the Service reviews the proposed action and finds that no significant changes in the action as planned or in the information used during the conference have occurred, the Service will confirm the conference as a formal consultation on the project and no further section 7 consultation will be necessary. Use of the formal conference process in this manner can prevent delays in the event the proposed species is listed or the proposed critical habitat is designated during project development or implementation.

Candidate species are those species presently under review by the Service for consideration for Federal listing. Candidate species should be considered in the planning process because they may become listed or proposed for listing prior to project completion. Preparation of a biological assessment, as described in section 7(c) of the Act, is not required for candidate species. If early evaluation of your project indicates that it is likely to affect a candidate species, you may wish to request technical assistance from this office.

Only listed species receive protection under the Act. However, sensitive species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. We recommend that you review information in the California Department of Fish and Wildlife's Natural Diversity Data Base. You can contact the California Department of Fish and Wildlife at (916) 324-3812 for information on other sensitive species that may occur in this area.

[*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.]

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:

Ventura Fish And Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003-7726
(805) 644-1766

Project Summary

Consultation Code: 08EVEN00-2020-SLI-0650

Event Code: 08EVEN00-2020-E-01406

Project Name: San Lorenzo and Kings Creek Bridge

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: bridge replacement project

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.1418393075307N122.13182179423691W

Counties: Santa Cruz, CA

Endangered Species Act Species

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
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
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered

Reptiles

NAME	STATUS
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5956	Endangered

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	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

Flowering Plants

NAME	STATUS
Ben Lomond Spineflower *Chorizanthe pungens var. hartwegiana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7498	Endangered
Ben Lomond Wallflower *Erysimum teretifolium* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7429	Endangered
Marsh Sandwort *Arenaria paludicola* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2229	Endangered
Scotts Valley Polygonum *Polygonum hickmanii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3222	Endangered
Scotts Valley Spineflower *Chorizanthe robusta var. hartwegii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7108	Endangered

Conifers and Cycads

NAME	STATUS
Santa Cruz Cypress *Cupressus abramsiana*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/1678

Critical habitats

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

***The special status species list from the National Marine Fisheries Service was updated since draft document circulation.**

From: Herbert, Stephanie@DOT
To: nmfs.wcrca.specieslist@noaa.gov
Subject: Updated Species List 1H470 San Lorenzo and Kings Creek Bridge Replacement
Date: Monday, January 25, 2021 4:23:00 PM

Good Afternoon,

I am emailing to submit the following species lists for the 1H470 San Lorenzo and Kings Creek Bridge Replacement Project.

Thanks,
Steph Herbert

Quad Name **Castle Rock Ridge**
Quad Number **37122-B1**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) - **X**
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat - **X**
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - **X**
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -

Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

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 **Big Basin**
Quad Number **37122-B2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) - X
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - X
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat - X
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - X
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

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 -
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 -

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Big Basin (3712222) OR Castle Rock Ridge (3712221))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Aneides niger Santa Cruz black salamander	G3 S3	None None	CDFW_SSC-Species of Special Concern	441 2,300	78 S:15	1	0	0	0	0	14	11	4	15	0	0
Anomobryum julaceum slender silver moss	G5? S2	None None	Rare Plant Rank - 4.2		13 S:1	0	0	0	0	0	1	0	1	1	0	0
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	530 530	420 S:1	0	0	0	0	0	1	1	0	1	0	0
Arctostaphylos andersonii Anderson's manzanita	G2 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCSC-UC Santa Cruz	525 2,400	64 S:21	2	7	4	1	0	7	6	15	21	0	0
Arctostaphylos glutinosa Schreiber's manzanita	G1 S1	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCSC-UC Santa Cruz SB_USDA-US Dept of Agriculture	1,800 2,230	7 S:2	1	0	0	1	0	0	1	1	2	0	0
Arctostaphylos ohloneana Ohlone manzanita	G1 S1	None None	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture	1,700 1,700	4 S:1	0	0	0	0	0	1	0	1	1	0	0
Arctostaphylos regismontana Kings Mountain manzanita	G2 S2	None None	Rare Plant Rank - 1B.2	2,000 2,000	17 S:1	0	0	0	0	0	1	1	0	1	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Arctostaphylos silvicola Bonny Doon manzanita	G1 S1	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	900 1,286	16 S:3	1	0	1	0	0	1	1	2	3	0	0
Bombus caliginosus obscure bumble bee	G4? S1S2	None None	IUCN_VU-Vulnerable	400 400	181 S:1	0	0	0	0	0	1	1	0	1	0	0
Bombus occidentalis western bumble bee	G2G3 S1	None Candidate Endangered	USFS_S-Sensitive		281 S:1	0	0	0	0	0	1	1	0	1	0	0
Brachyramphus marmoratus marbled murrelet	G3G4 S1	Threatened Endangered	CDF_S-Sensitive IUCN_EN-Endangered NABCI_RWL-Red Watch List	400 1,200	110 S:9	0	1	0	0	0	8	4	5	9	0	0
Calasellus californicus An isopod	G2 S2	None None		730 730	3 S:1	0	0	0	0	0	1	1	0	1	0	0
Calyptridium parryi var. hesseae Santa Cruz Mountains pussypaws	G3G4T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	2,300 2,600	11 S:2	0	0	0	0	0	2	2	0	2	0	0
Chorizanthe pungens var. hartwegiana Ben Lomond spineflower	G2T1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_UCSC-UC Santa Cruz	600 1,160	18 S:4	0	1	0	0	0	3	3	1	4	0	0
Clarkia concinna ssp. automixa Santa Clara red ribbons	G5?T3 S3	None None	Rare Plant Rank - 4.3	900 2,000	20 S:2	0	0	0	0	0	2	2	0	2	0	0
Corynorhinus townsendii Townsend's big-eared bat	G3G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	930 1,980	635 S:3	0	1	1	0	0	1	1	2	3	0	0
Dicamptodon ensatus California giant salamander	G3 S2S3	None None	CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	440 2,250	234 S:14	0	0	0	0	0	14	6	8	14	0	0
Dipodomys venustus venustus Santa Cruz kangaroo rat	G4T1 S1	None None		550 775	29 S:2	0	0	0	0	2	0	2	0	0	2	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Emys marmorata western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	1,835 1,835	1398 S:1	0	1	0	0	0	0	0	1	1	0	0
Erethizon dorsatum North American porcupine	G5 S3	None None	IUCN_LC-Least Concern	550 550	523 S:1	0	0	0	0	0	1	1	0	1	0	0
Falco peregrinus anatum American peregrine falcon	G4T4 S3S4	Delisted Delisted	CDF_S-Sensitive CDFW_FP-Fully Protected USFWS_BCC-Birds of Conservation Concern	1,374 1,374	58 S:1	1	0	0	0	0	0	0	1	1	0	0
Fissidens pauperculus minute pocket moss	G3? S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive		22 S:1	0	0	0	0	0	1	1	0	1	0	0
Grimmia torenii Toren's grimmia	G2 S2	None None	Rare Plant Rank - 1B.3 BLM_S-Sensitive	1,970 2,325	13 S:4	0	0	0	0	0	4	0	4	4	0	0
Grimmia vaginulata vaginulate grimmia	G3 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	2,250 2,250	2 S:1	0	0	0	0	0	1	0	1	1	0	0
Hesperevax sparsiflora var. brevifolia short-leaved evax	G4T3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	850 850	72 S:1	0	0	0	0	0	1	1	0	1	0	0
Hesperocyparis abramsiana var. abramsiana Santa Cruz cypress	G1T1 S1	Threatened Endangered	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCSC-UC Santa Cruz	1,000 2,000	7 S:2	0	1	0	0	0	1	0	2	2	0	0
Hesperocyparis abramsiana var. butanoensis Butano Ridge cypress	G1T1 S1	Threatened Endangered	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	1,400 1,400	1 S:1	0	0	0	0	0	1	0	1	1	0	0
Hoita strobilina Loma Prieta hoita	G2? S2?	None None	Rare Plant Rank - 1B.1	900 900	34 S:1	0	0	0	0	0	1	1	0	1	0	0
Malacothamnus arcuatus arcuate bush-mallow	G2Q S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	1,200 1,200	30 S:1	0	0	0	0	0	1	1	0	1	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Monolopia gracilens woodland woollythreads	G3 S3	None None	Rare Plant Rank - 1B.2	1,500 1,500	68 S:3	0	0	0	0	0	3	3	0	3	0	0
N. Central Coast Calif. Roach/Stickleback/Steelhead Stream N. Central Coast Calif. Roach/Stickleback/Steelhead Stream	GNR SNR	None None		200 200	2 S:1	0	1	0	0	0	0	1	0	1	0	0
North Central Coast Drainage Sacramento Sucker/Roach River North Central Coast Drainage Sacramento Sucker/Roach River	GNR SNR	None None		400 400	4 S:1	0	1	0	0	0	0	1	0	1	0	0
Northern Interior Cypress Forest Northern Interior Cypress Forest	G2 S2.2	None None		1,000 2,100	22 S:3	0	0	0	0	0	3	3	0	3	0	0
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	G4 S2	Endangered Endangered	AFS_EN-Endangered	400 400	23 S:1	0	0	0	1	0	0	1	0	1	0	0
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	G5T2T3Q S2S3	Threatened None	AFS_TH-Threatened	200 400	44 S:2	0	0	0	0	0	2	1	1	2	0	0
Orthotrichum kellmanii Kellman's bristle moss	G1 S1	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	2,133 2,247	4 S:2	0	0	0	0	0	2	0	2	2	0	0
Pandion haliaetus osprey	G5 S4	None None	CDF_S-Sensitive CDFW_WL-Watch List IUCN_LC-Least Concern	590 590	504 S:1	1	0	0	0	0	0	0	1	1	0	0
Pedicularis dudleyi Dudley's lousewort	G2 S2	None Rare	Rare Plant Rank - 1B.2 SB_UCSC-UC Santa Cruz USFS_S-Sensitive	500 500	11 S:2	0	1	0	0	0	1	1	1	2	0	0
Penstemon rattanii var. kleei Santa Cruz Mountains beardtongue	G4T2 S2	None None	Rare Plant Rank - 1B.2	2,000 2,000	5 S:1	0	0	0	0	0	1	1	0	1	0	0
Pentachaeta bellidiflora white-rayed pentachaeta	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_UCBG-UC Botanical Garden at Berkeley	680 2,000	14 S:3	0	0	0	0	2	1	3	0	1	2	0
Piperia candida white-flowered rein orchid	G3 S3	None None	Rare Plant Rank - 1B.2	500 1,300	222 S:3	0	0	0	0	0	3	1	2	3	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	G3T1Q S1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_UCSC-UC Santa Cruz	800 800	42 S:1	0	0	0	0	0	1	1	0	1	0	0
Rana boylii foothill yellow-legged frog	G3 S3	None Endangered	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	363 1,654	2468 S:8	0	0	0	0	3	5	8	0	5	2	1
Rana draytonii California red-legged frog	G2G3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	1,280 1,280	1574 S:1	0	0	0	0	0	1	1	0	1	0	0
Speyeria adiaste adiaste unsilvered fritillary	G1G2T1 S1	None None		1,600 1,600	2 S:1	0	1	0	0	0	0	1	0	1	0	0
Stebbinsoseris decipiens Santa Cruz microseris	G2 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCSC-UC Santa Cruz		19 S:1	0	0	0	0	0	1	1	0	1	0	0
Trifolium buckwestiorum Santa Cruz clover	G2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_SBBG-Santa Barbara Botanic Garden SB_UCSC-UC Santa Cruz SB_USDA-US Dept of Agriculture	800 800	64 S:1	0	0	0	0	0	1	0	1	1	0	0
Trifolium polyodon Pacific Grove clover	G1 S1	None Rare	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_USDA-US Dept of Agriculture	870 870	21 S:1	0	0	0	0	0	1	1	0	1	0	0
Trimerotropis infantilis Zayante band-winged grasshopper	G1 S1	Endangered None	IUCN_EN-Endangered	800 800	6 S:1	0	0	0	0	1	0	1	0	0	0	1
Usnea longissima Methuselah's beard lichen	G4 S4	None None	Rare Plant Rank - 4.2 BLM_S-Sensitive	2,040 2,040	206 S:1	0	0	0	0	1	0	1	0	0	0	1

Government Version -- Dated August, 30 2020 -- Biogeographic Data Branch

Page 5 of 5

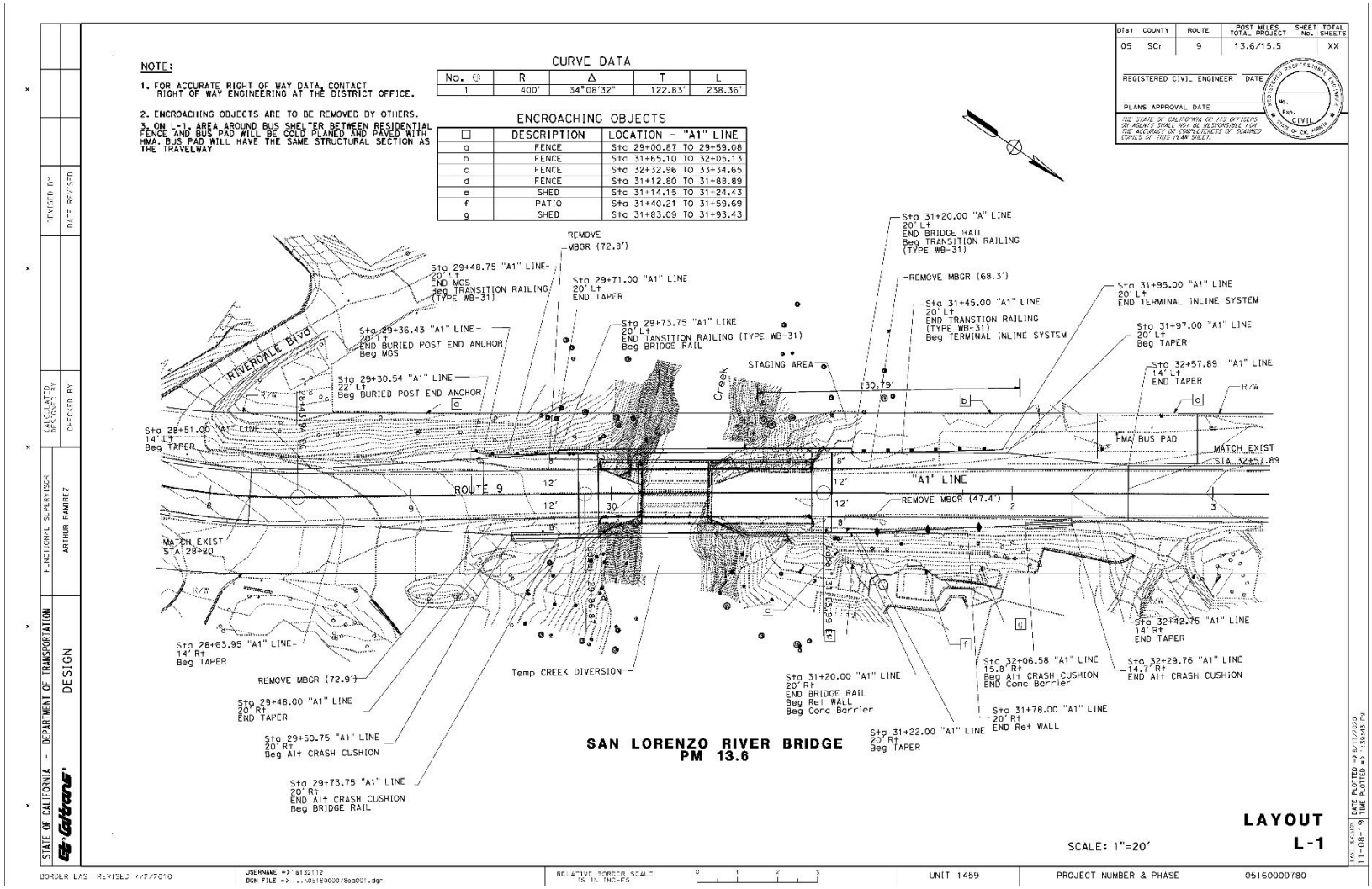
Report Printed on Monday, September 28, 2020

Information Expires 2/28/2021

Appendix F Project Layouts and Construction Activity Areas (added to the Final Environmental Document)

Project Layout and Construction Glossary

Alt	alternative
BC	begin curve
Beg	begin
Conc	concrete
EC	end curve
HMA	hot mix asphalt
Lt	left
MBGR	Metal Beam Guard Rail
MGS	Midwest Guardrail System
PM	post mile
Ret	retaining
Rt	right
Shldr	shoulder
Sta	station
Temp	temporary


NOTE:
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. ENCROACHING OBJECTS ARE TO BE REMOVED BY OTHERS.
3. ON L-1, AREA AROUND BUS SHELTER BETWEEN RESIDENTIAL FENCE AND BUS PAD WILL BE COLD PLANED AND PAVED WITH HMA. BUS PAD WILL HAVE THE SAME STRUCTURAL SECTION AS THE TRAVELWAY
CURVE DATA
No. | R | Δ | T | L
1 | 400' | 34°08'32" | 122.83' | 238.36'
ENCROACHING OBJECTS
□ | DESCRIPTION | LOCATION - "A1" LINE
a | FENCE | Sta 29+00.87 TO 29+59.08
b | FENCE | Sta 31+65.10 TO 32+05.13
c | FENCE | Sta 32+32.96 TO 33+34.65
d | FENCE | Sta 31+12.80 TO 31+88.89
e | SHED | Sta 31+14.15 TO 31+24.43
f | PATIO | Sta 31+40.21 TO 31+59.69
g | SHED | Sta 31+83.09 TO 31+93.43
Dist COUNTY ROUTE POST MILES TOTAL PROJECT SHEET TOTAL No. SHEETS
05 SCr 9 13.6/15.5 XX
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS ITEM SHEET.
REVISED BY
DATE REVISED
CALCULATED/DESIGNED BY
CHECKED BY
FUNCTIONAL SUPERVISOR
ARTHUR RAMIREZ
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN
Caltrans
Sta 29+48.75 "A1" LINE 20' Lt END MGS Beg TRANSITION RAILING (TYPE WB-31)
REMOVE MBGR (72.8')
Sta 29+71.00 "A1" LINE 20' Lt END TAPER
Sta 29+36.43 "A1" LINE 20' Lt END BURIED POST END ANCHOR Beg MGS
Sta 29+30.54 "A1" LINE 22' Lt Beg BURIED POST END ANCHOR
Sta 29+73.75 "A1" LINE 20' Lt END TANSITION RAILING (TYPE WB-31) Beg BRIDGE RAIL
Sta 31+20.00 "A" LINE 20' Lt END BRIDGE RAIL Beg TRANSITION RAILING (TYPE WB-31)
REMOVE MBGR (68.5')
Sta 31+45.00 "A1" LINE 20' Lt END TRANSTION RAILING (TYPE WB-31) Beg TERMINAL INLINE SYSTEM
Sta 31+95.00 "A1" LINE 20' Lt END TERMINAL INLINE SYSTEM
Sta 31+97.00 "A1" LINE 20' Lt Beg TAPER
Sta 32+57.89 "A1" LINE 14' Lt END TAPER
STAGING AREA
130.79'
Creek
RIVERDALE BLVD
Sta 28+51.00 "A1" LINE 14' Lt Beg TAPER
ROUTE 9
"A1" LINE
REMOVE MBGR (47.4')
HMA BUS PAD
MATCH EXIST STA 32+57.89
MATCH EXIST STA 28+80
Sta 28+63.95 "A1" LINE 14' Rt Beg TAPER
REMOVE MBGR (72.9')
Sta 29+48.00 "A1" LINE 20' Rt END TAPER
Sta 29+50.75 "A1" LINE 20' Rt Beg Alt CRASH CUSHION
Sta 29+73.75 "A1" LINE 20' Rt END Alt CRASH CUSHION Beg BRIDGE RAIL
Temp CREEK DIVERSION
Sta 31+20.00 "A1" LINE 20' Rt END BRIDGE RAIL Beg Ret WALL Beg Conc Barrier
Sta 31+22.00 "A1" LINE 20' Rt Beg TAPER
Sta 32+06.58 "A1" LINE 15.8' Rt Beg Alt CRASH CUSHION END Conc Barrier
Sta 31+78.00 "A1" LINE 20' Rt END Ret WALL
Sta 32+29.76 "A1" LINE 14.7' Rt END Alt CRASH CUSHION
Sta 32+42.25 "A1" LINE 14' Rt END TAPER
SAN LORENZO RIVER BRIDGE
PM 13.6
LAYOUT
L-1
SCALE: 1"=20'
BORDER LAS - REVISED 12/7/2010
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RELATIVE BORDER SCALE IS IN INCHES
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UNIT 1459
PROJECT NUMBER & PHASE 05160000780
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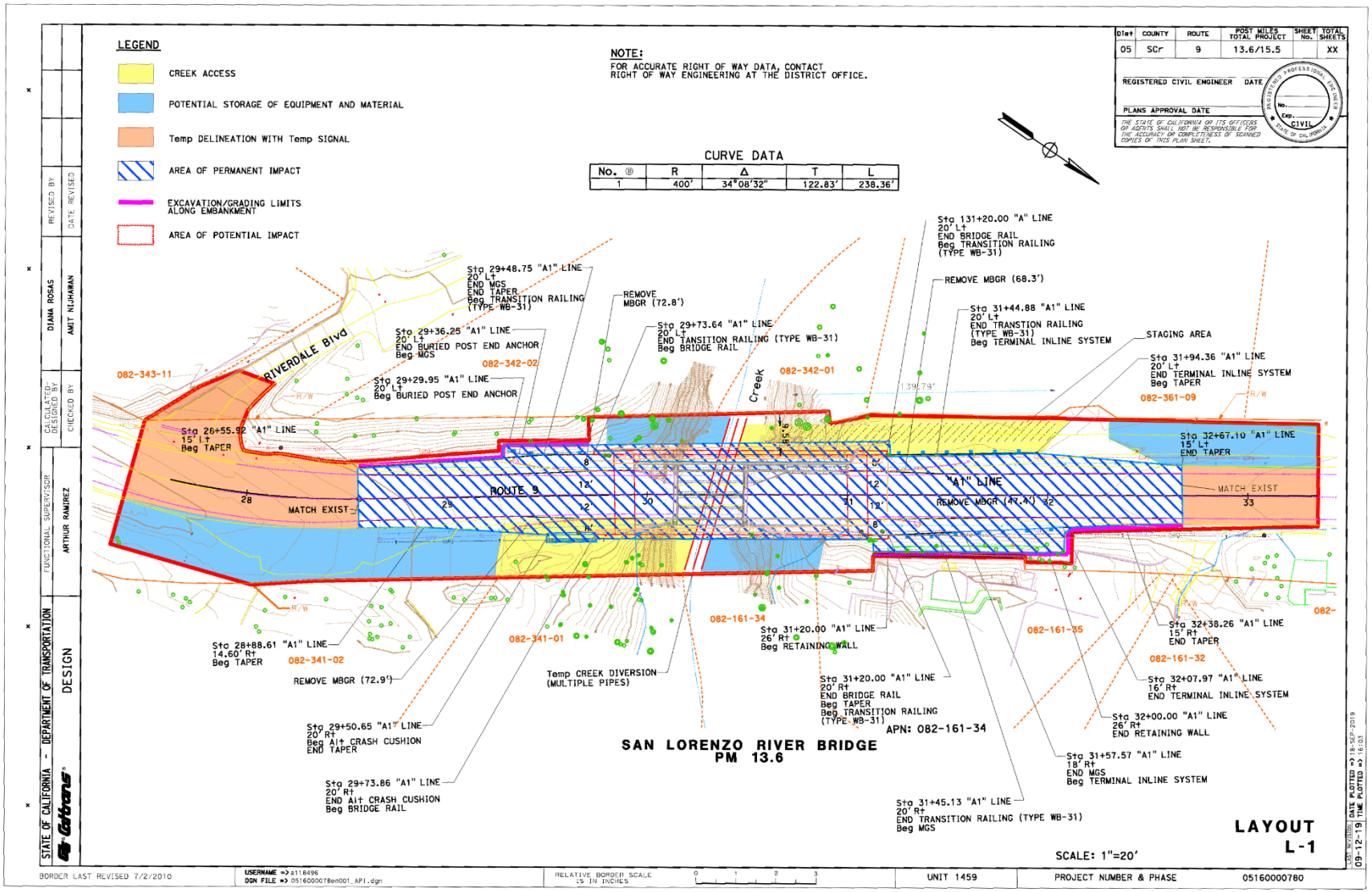
TIME PLOTTED => 13:54:07


LEGEND
CREEK ACCESS
POTENTIAL STORAGE OF EQUIPMENT AND MATERIAL
Temp DELINEATION WITH Temp SIGNAL
AREA OF PERMANENT IMPACT
EXCAVATION/GRADING LIMITS ALONG EMBANKMENT
AREA OF POTENTIAL IMPACT
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
CURVE DATA
No. | R | Δ | T | L
1 | 400' | 34°08'32" | 122.83' | 238.36'
Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS
05 | SCr | 9 | 13.6/15.5 | | XX
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
Sta 131+20.00 "A" LINE
20' Lt
END BRIDGE RAIL
Beg TRANSITION RAILING (TYPE WB-31)
REMOVE MBGR (68.3')
Sta 31+44.88 "A1" LINE
20' Lt
END TRANSITION RAILING (TYPE WB-31)
Beg TERMINAL INLINE SYSTEM
STAGING AREA
Sta 31+94.36 "A1" LINE
20' Lt
END TERMINAL INLINE SYSTEM
Beg TAPER
082-361-09
Sta 29+48.75 "A1" LINE
20' Lt
END MGS
END TAPER
Beg TRANSITION RAILING (TYPE WB-31)
REMOVE MBGR (72.8')
Sta 29+73.64 "A1" LINE
20' Lt
END TANSITION RAILING (TYPE WB-31)
Beg BRIDGE RAIL
Sta 29+36.25 "A1" LINE
20' Lt
END BURIED POST END ANCHOR
Beg MGS
082-342-02
Sta 29+29.95 "A1" LINE
20' Lt
Beg BURIED POST END ANCHOR
082-343-11
RIVERDALE Blvd
082-342-01
Creek
Sta 26+55.92 "A1" LINE
15' Lt
Beg TAPER
ROUTE 9
MATCH EXIST
"A1" LINE
REMOVE MBGR (47.4')
Sta 32+67.10 "A1" LINE
15' Lt
END TAPER
MATCH EXIST
Sta 28+88.61 "A1" LINE
14.60' Rt
Beg TAPER
082-341-02
REMOVE MBGR (72.9')
082-341-01
Temp CREEK DIVERSION (MULTIPLE PIPES)
082-161-34
Sta 31+20.00 "A1" LINE
26' Rt
Beg RETAINING WALL
Sta 31+20.00 "A1" LINE
20' Rt
END BRIDGE RAIL
Beg TAPER
Beg TRANSITION RAILING (TYPE WB-31)
APN: 082-161-34
082-161-35
Sta 32+38.26 "A1" LINE
15' Rt
END TAPER
082-161-32
Sta 32+07.97 "A1" LINE
16' Rt
END TERMINAL INLINE SYSTEM
Sta 32+00.00 "A1" LINE
26' Rt
END RETAINING WALL
Sta 29+50.65 "A1" LINE
20' Rt
Beg Alt CRASH CUSHION
END TAPER
Sta 29+73.86 "A1" LINE
20' Rt
END Alt CRASH CUSHION
Beg BRIDGE RAIL
Sta 31+57.57 "A1" LINE
18' Rt
END MGS
Beg TERMINAL INLINE SYSTEM
Sta 31+45.13 "A1" LINE
20' Rt
END TRANSITION RAILING (TYPE WB-31)
Beg MGS
SAN LORENZO RIVER BRIDGE
PM 13.6
LAYOUT
L-1
SCALE: 1"=20'
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN
FUNCTIONAL SUPERVISOR
ARTHUR RAMIREZ
CALCULATED-DESIGNED BY
DIANA ROSAS
CHECKED BY
AMIT NIJHAWAN
REVISED BY
DATE REVISED
LAST REVISION
DATE PLOTTED => 19-SEP-2019
TIME PLOTTED => 16:03
09-12-19
BORDER LAST REVISED 7/2/2010
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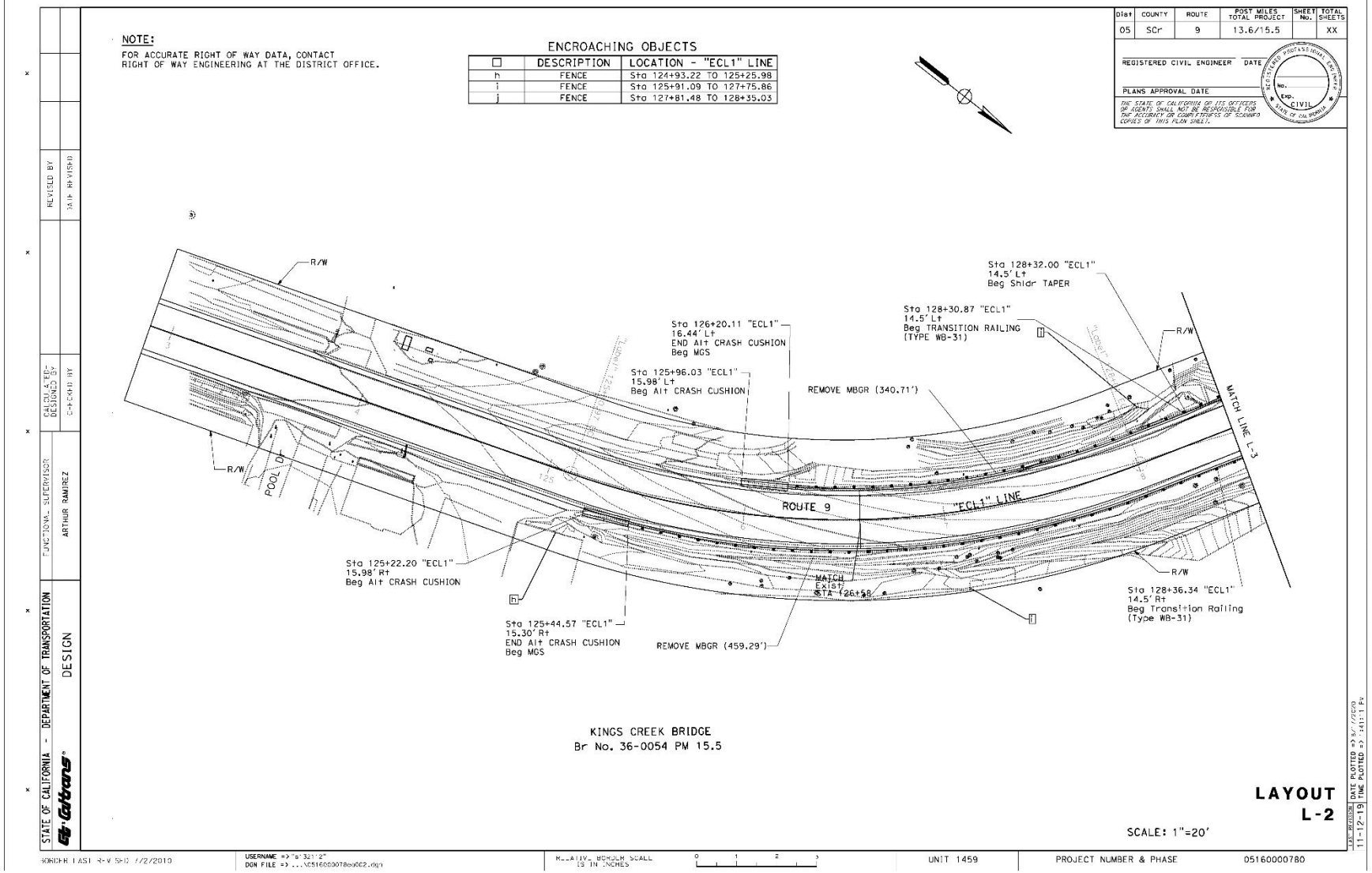
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
ENCROACHING OBJECTS
□ | DESCRIPTION | LOCATION - "ECL1" LINE
h | FENCE | Sta 124+93.22 TO 125+25.98
i | FENCE | Sta 125+91.09 TO 127+75.86
j | FENCE | Sta 127+81.48 TO 128+35.03
Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS
05 | SCr | 9 | 13.6/15.5 | | XX
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER No. EXP. CIVIL STATE OF CALIFORNIA
R/W
Sta 126+20.11 "ECL1"
16.44' Lt
END Alt CRASH CUSHION
Beg MGS
Sta 125+96.03 "ECL1"
15.98' Lt
Beg Alt CRASH CUSHION
REMOVE MBGR (340.71')
Sta 128+32.00 "ECL1"
14.5' Lt
Beg Shldr TAPER
Sta 128+30.87 "ECL1"
14.5' Lt
Beg TRANSITION RAILING
(TYPE WB-31)
MATCH LINE L-3
POOL
ROUTE 9
"ECL1" LINE
Sta 125+22.20 "ECL1"
15.98' Rt
Beg Alt CRASH CUSHION
Sta 125+44.57 "ECL1"
15.30' Rt
END Alt CRASH CUSHION
Beg MGS
REMOVE MBGR (459.29')
MATCH Exist STA 126+58
Sta 128+36.34 "ECL1"
14.5' Rt
Beg Transition Railing
(Type WB-31)
KINGS CREEK BRIDGE
Br No. 36-0054 PM 15.5
LAYOUT
L-2
SCALE: 1"=20'
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN
FUNCTIONAL SUPERVISOR: ARTHUR RAMIREZ
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
MAP REVISED
DATE PLOTTED => 11-12-19
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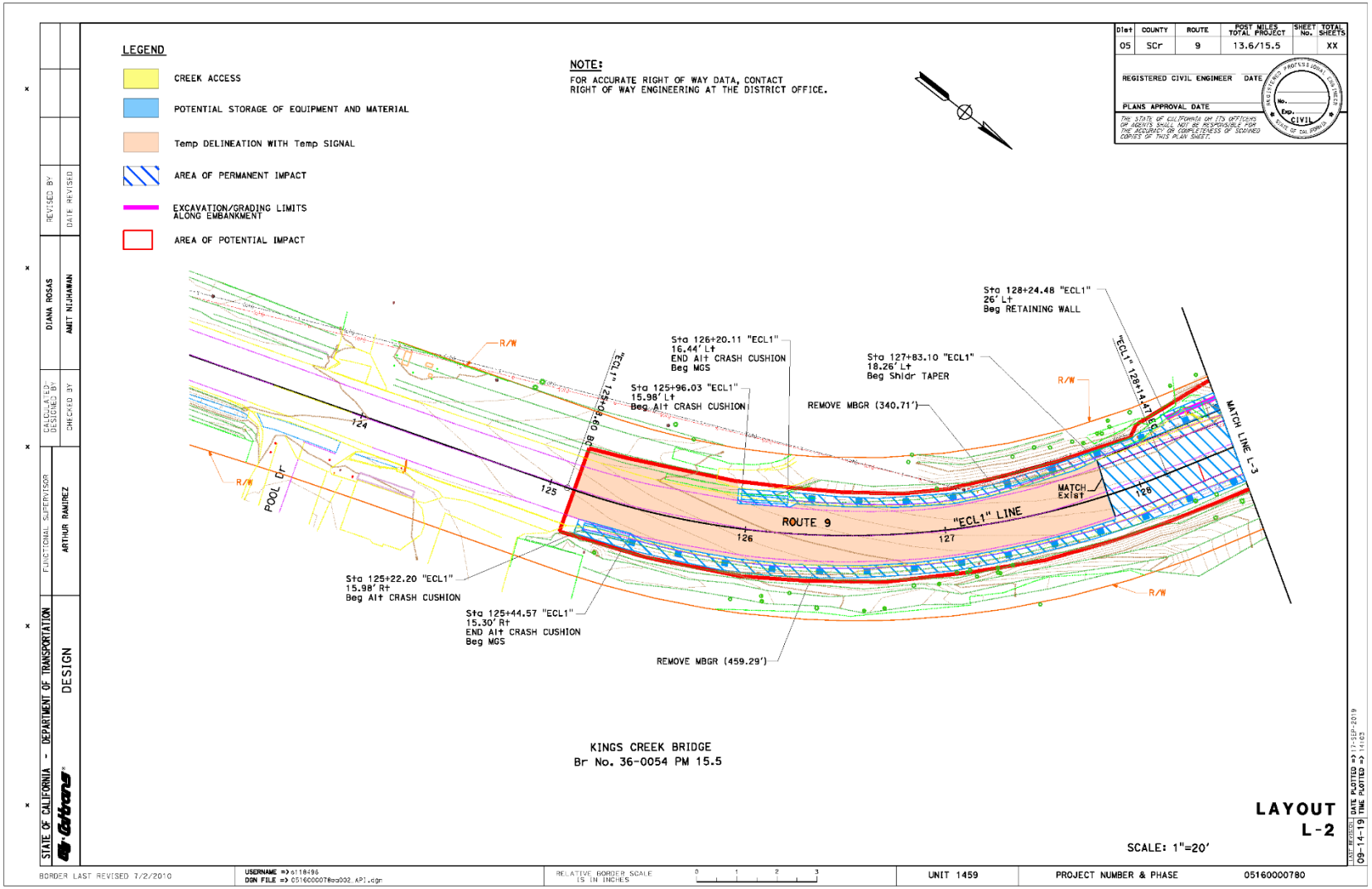
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AREA OF POTENTIAL IMPACT
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127
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LAYOUT L-2
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN
FUNCTIONAL SUPERVISOR ARTHUR RAMIREZ
DESIGNED BY DIANA ROSAS
CHECKED BY AMIT NIJHAWAN
REVISED BY
DATE REVISED
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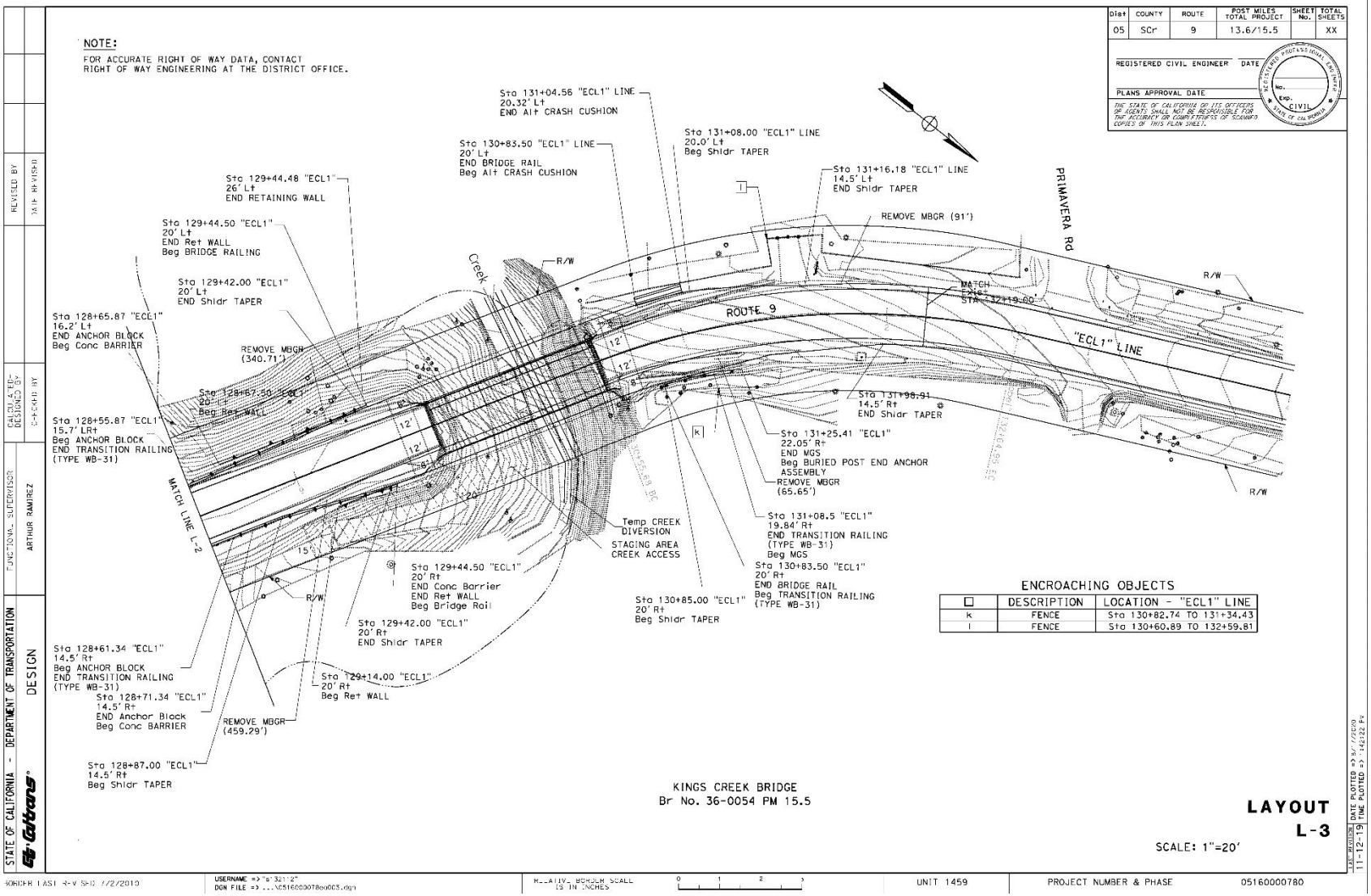
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REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
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Beg Shldr TAPER
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20' Lt
END BRIDGE RAIL
Beg Alt CRASH CUSHION
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14.5' Lt
END Shldr TAPER
PRIMAVERA Rd
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26' Lt
END RETAINING WALL
Sta 129+44.50 "ECL1"
20' Lt
END Ret WALL
Beg BRIDGE RAILING
Sta 129+42.00 "ECL1"
20' Lt
END Shldr TAPER
Creek
R/W
ROUTE 9
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STAGING AREA
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END Anchor Block
Beg Conc BARRIER
REMOVE MBGR
(459.29')
Sta 128+87.00 "ECL1"
14.5' Rt
Beg Shldr TAPER
ENCROACHING OBJECTS
□ | DESCRIPTION | LOCATION - "ECL1" LINE
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l | FENCE | Sta 130+60.89 TO 132+59.81
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Br No. 36-0054 PM 15.5
LAYOUT
L-3
SCALE: 1"=20'
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DESIGN
FUNCTIONAL SUPERVISOR
ARTHUR RAMIREZ
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
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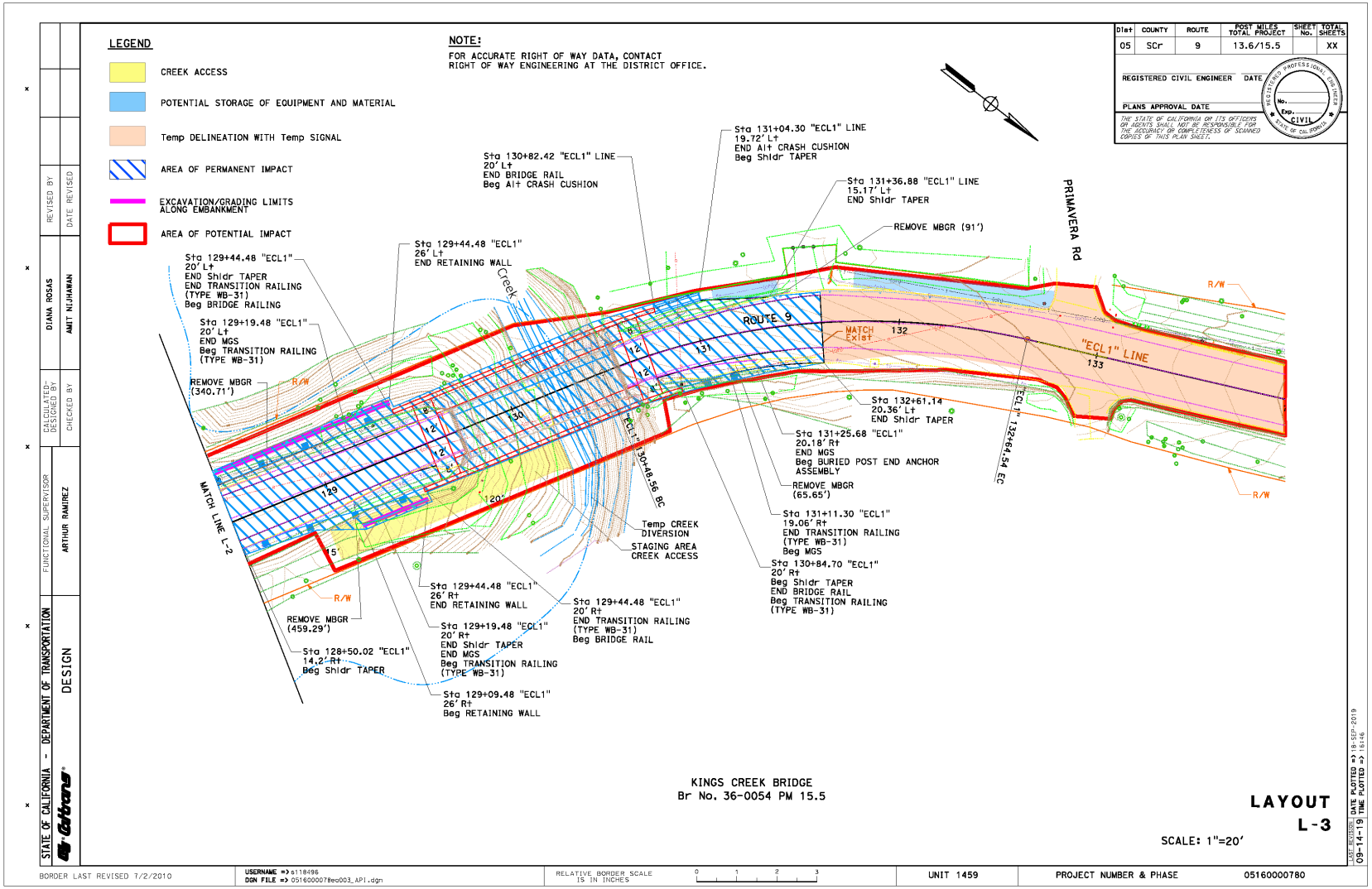
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NOTE:
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Dist 05 | COUNTY SCr | ROUTE 9 | POST MILES TOTAL PROJECT 13.6/15.5 | SHEET No. | TOTAL SHEETS XX
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
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STAGING AREA CREEK ACCESS
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DESIGN
FUNCTIONAL SUPERVISOR ARTHUR RAMIREZ
CALCULATED-DESIGNED BY DIANA ROSAS
CHECKED BY AMIT NIJHAWAN
REVISED BY
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UNIT 1459
PROJECT NUMBER & PHASE 05160000780

Appendix G Biological Opinion and Incidental Take Statement ESA Section 7 Consultation (added to the Final Environmental Document)

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

December 23, 2020 **Refer to NMFS No:** WCRO-2020-02273

Karen Holmes
Senior Environmental Planner
California Department of Transportation
50 Higuera Street
San Luis Obispo, California 93401-5415

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the San Lorenzo River Bridge and Kings Creek Bridge Replacement (05-1H470)

Dear Ms. Holmes:

Thank you for the California Department of Transportation's (Caltrans)[1] letter on August 17, 2020, 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 San Lorenzo River Bridge and Kings Creek Bridge Replacement (05-1H470). This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016). 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 (16 U.S.C. 1855(b)) for this action.

The enclosed biological opinion is based on our review of Caltrans' proposed project and describes NMFS' analysis of potential effects on threatened Central California Coast (CCC) steelhead, Central California Coast (CCC) coho salmon, and designated critical habitat for these species in accordance with section 7 of the ESA. In the enclosed biological opinion, NMFS concludes the project is not likely to jeopardize the continued existence of these species; nor is it likely to adversely modify critical habitat. However, NMFS anticipates that take of CCC steelhead and CCC coho salmon may occur. An incidental take statement which applies to this project with non-discretionary terms and conditions is included with the enclosed opinion.

[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 highway 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 project. Thus, per the aforementioned MOU, Caltrans is considered the federal action agency for this project.

NMFS has reviewed the proposed project for potential effects on EFH and determined that the proposed project would adversely affect EFH for Pacific Coast Salmon, which are managed under the Pacific Coast Salmon Fishery Management Plan. While the proposed action will result in adverse effects to EFH, the proposed project contains measures to minimize, mitigate, or otherwise offset the adverse effects; thus, no EFH Conservation Recommendations are included in this opinion.

If you have any questions concerning this consultation, or if you require additional information, please contact Elena Meza, North Central Coast Office in Santa Rosa, California at 707-575-6068 or via email at elena.meza@noaa.gov.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Stephanie Herbert, Assoc. Environmental Planner, Caltrans, Stephanie.herbert@dot.ca.gov
Copy to E-File: ARN 151422WCR2020SR00173

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response

San Lorenzo River Bridge and Kings Creek Bridge Replacement

NMFS Consultation Number: WCRO-2020-02273
Action Agency: California Department of Transportation (Caltrans)

Table 1. Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely to Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely to Destroy or Adversely Modify Critical Habitat?
Central California Coast Coho Salmon (*Oncorhynchus kisutch*)	Endangered	Yes	No	Yes	No
Central California Coast steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	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 Office

Date: December 23, 2020

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

NOAA's 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 U.S.C. 1531 et seq.), and implementing regulations at 50 CFR 402, as amended.

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 within two weeks at the NOAA Library Institutional Repository. A complete record of this consultation is on file at NMFS' North-Central Coast Office in Santa Rosa, California.

1.2. Consultation History

On August 18, 2020, we received an initiation package from Caltrans requesting formal consultation for their project. Caltrans' request included a Biological Assessment, preliminary project plans, and D.W. Alley & Associates' (DWAA) 2018 steelhead report. Caltrans provided additional information to us on September 3, 2020, regarding the existing and proposed bridge dimensions, implementation of a debris containment system, clarification that sacked concrete removal will occur above the ordinary high water mark, and that 60% bridge design plans will be sent to us for review approximately five months prior to construction. On September 4, 2020, we notified Caltrans via email that there was sufficient information to initiate consultation, and that their consultation initiation date is August 18, 2020.

1.3. Proposed Federal Action

Under the ESA, "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). Under MSA, 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).

The project proposes to replace two bridges within Santa Cruz County, California on State Route (SR) 9, the San Lorenzo River Bridge[2] (No. 36-0052) at PM 13.6 and the Kings Creek Bridge[3] (No. 36-0054) at PM 15.5. The purpose of the project is to replace deteriorating infrastructure

[2] 37.132981/-122.125339
[3] 37.156378/-122.133703

that poses a threat to public safety. Both of the proposed new bridges will be constructed on the same alignment as the existing bridges.

1.3.1. San Lorenzo River Bridge Replacement

The existing San Lorenzo River Bridge is a steel stringer bridge with three spans. It is approximately 106 feet long and 30 feet wide (0.074 acres), and consists of two 12-foot lanes and two 3.25-feet curbs with wooden rails. The proposed new bridge will be a free span structure approximately 106 feet long and 40 feet wide (0.098 acres). The bridge will be equipped with standard 12-foot lanes, 8-foot shoulders, and a standard Midwest guardrail system (MGS). To avoid full closure of SR-9, one of the existing lanes will remain open while the other lane is demolished and removed. Because the existing abutments were constructed by casting materials directly into the exposed bedrock within the stream channel, the abutments will be partially removed in an effort to minimize removal of bedrock and alteration of the stream channel.[4] Following demolition, an alternate crash cushion will be installed on the southeast side of the bridge at the southern end of the MGS, and a buried post end anchor will be installed southwest of the bridge at the end of the MGS. Because the bridge is wider than the approaching road, tapers on each side of the bridge will be paved from the 8-foot bridge shoulder to the existing roadway shoulder. A retaining wall approximately 80 feet long will be built near the northeast corner of the bridge. Thirty-six cast-in-drilled-hole (CIDH) piles will support the new bridge. The piles are each 24 inches in diameter, will be installed to a depth of 70 feet, and approximately 10 feet above the OHWM. To prevent construction debris and contaminants from entering into the riverbed, a debris catchment system will be used and may be constructed out of wood, netting, steel, and plastic sheeting. Following construction of the new lane, traffic will be shifted and the remaining portion of the existing bridge will be demolished, removed, and the final bridge elements will be constructed. As part of the project, Caltrans will submit 60% bridge design plans to the Santa Rosa Caltrans Liaison for review at least five months prior to construction so NMFS can confirm the effects of the final project design are the same as the effects we associated with the preliminary design (30%), which are the basis of this consultation.

Staging and access is proposed in the northwest and southeast corners of the bridge. Staging will primarily occur within Caltrans' existing right-of-way due to limited space surrounding the bridge, private residences, and steep slopes. Temporary access roads will be constructed to provide access under, and near, the bridge and will require removal of four trees and additional vegetation in the first year of construction. Following completion of the project, all temporary construction areas (including access roads) will be revegetated.[5]

Access to the creek bed is needed to remove the existing bridge and construct the new bridge, and while instream construction work will be conducted during the dry season when flows are at

[4] Abutments will be removed to the extent required to make space for the new bridge abutments, and therefore will not be removed to original grade. Future design plans are anticipated to provide greater detail on existing abutment removal.

[5] While not known at this time, it is expected that specific replanting ratios (e.g. 3:1) will be required as part of the anticipated permit requirements associated with a 1602 streambed alteration agreement, and 404 and 401 permits.

annual lows (June 1 – October 15), a creek diversion will be necessary. To gain access, water will be temporarily diverted around the work area using a series of pipes, sized appropriately to the flow of water, and cofferdams up- and downstream of the area to be dewatered.[6] A maximum of 82 linear feet of the San Lorenzo River will be diverted to complete the project. As a result of maintaining an open lane throughout construction to avoid a full closure of SR 9, overall project construction may take a maximum of three construction seasons to complete; thus, Caltrans anticipates that a maximum of three dewatering events may occur. CCC coho salmon and CCC steelhead, if present in the work area, will be collected and relocated prior to dewatering the work site. The project will result in 0.024 acres of permanent impacts to the river channel resulting from the increased width of the new bridge structure.

Typical equipment used to complete the project is expected to include the following: pavers and rollers, backhoes, bidwell and roller screeds, bobcats, bulldozers/loaders, compressors, concrete pumps and truck mixers, cranes, dump trucks, excavators, pick-up trucks, front-end loaders, forklifts, graders, compactors, saw cutters, water trucks, and drill rigs.

Caltrans proposes to include several avoidance and minimization measures (AMMs) that will be implemented before, during, and after construction to prevent and minimize project-related effects to CCC coho salmon and CCC steelhead, and their critical habitat. These measures include working within the in-water work window of June 1 – October 15; ensuring proper handling and relocation of listed salmonids species during dewatering/diverting activities; ensuring establishment of revegetation areas; preventing introduction of contaminants into waterways; use of a debris containment system; ensuring complete removal and proper disposal of all construction waste; implementing erosion control measures; development of a fish handling and relocation plan, stormwater pollution prevention plan, a habitat restoration and revegetation plan, and a spill prevention control and countermeasure plan. For a full list of AMMs and additional best management practices (BMPs) please see Caltrans' Biological Assessment (2020).

1.3.2. Kings Creek Bridge Replacement

The existing Kings Creek Bridge is a concrete tee beam style-bridge with two spans. It is approximately 88 feet long and 28 feet wide (0.057 acres), and consists of two 10.6-foot lanes with a 4.5-foot wide curb along the northbound lane. The existing bridge is partially supported by a pier (0.0005 acres) located below the OHWM within Kings Creek. The proposed new bridge will be a free span structure approximately 99 feet long and 40 feet wide (0.085 acres), with standard 12-foot lanes, 8-foot shoulders, and standard MGS. To avoid full closure of SR 9, one of the existing lanes will remain open while the other is demolished and removed. Because the existing abutments were constructed by casting materials directly into the exposed bedrock within the stream channel, existing abutments will be partially removed in an effort to minimize removal of bedrock and alteration of the stream channel. Similarly, a portion of existing sacked concrete (0.049 acres), located approximately 10 feet above OHWM, along the existing northern

[6] The ultimate design and materials used to create the dewatering/diversion system will be at the discretion of the contractor.

abutment, will be removed and replaced with rock slope protection (RSP). The existing pier located below the OHWM will be removed to approximately three feet below original grade. On each side of the bridge, a taper will be paved from the 8-foot bridge shoulder to the existing roadway shoulder. Alternate crash cushions will be placed at the southeast and southwest ends of the MGS. Northeast of the bridge, a buried-post end anchor will be installed at the end of the MGS. A retaining wall with a concrete barrier is proposed for both southwest and southeast of the proposed new bridge with approximate lengths of 120 feet and 35 feet, respectively. Thirty-six cast-in-drilled-hole (CIDH) piles will support the new bridge. The piles are each 24 inches in diameter, will be installed to a depth of 70 feet deep, and will be approximately 12-15 feet above the OHWM. To prevent construction debris and contaminants from entering into the riverbed, a debris catchment system will be used and may be constructed out of wood, netting, steel, and plastic sheeting. Following construction of the new lane, traffic will be shifted and the remaining portion of the existing bridge will be demolished, removed, and the final bridge elements constructed. As part of the project, Caltrans will submit 60% bridge design plans to the Santa Rosa Caltrans Liaison for review at least five months prior to construction so NMFS can confirm the effects of the final project design are the same as the effects we associated with the preliminary design (30%), which are the basis of this consultation.

Staging and access is proposed in the area southeast and northwest of the bridge. Staging will primarily occur within Caltrans' existing right-of-way due to limited space surrounding the bridge, private residences, and steep slopes. Temporary access roads will be constructed to provide access under and near the bridge and will require removal of one tree and some additional vegetation in the first year of construction. Following completion of the project, all temporary construction areas (including access roads) will be revegetated.[7]

Access to the creek bed is needed to remove the existing bridge and construct the new bridge, and while instream construction work will be conducted during the dry season when flows are at annual lows (June 1 – October 15), a creek diversion will be necessary. To gain access, water will be temporarily diverted around the work area using a series of pipes, sized appropriately to the flow of water, and cofferdams up-and downstream of the area to be dewatered.[8] A maximum of 79 linear feet of the Kings Creek will be diverted to complete the project. As a result of maintaining an open lane throughout construction to avoid a full closure of SR 9, overall project construction may take a maximum of three construction seasons to complete; thus, Caltrans anticipates that a maximum of three dewatering events may occur. CCC steelhead and CCC coho salmon, if present in the work area, will be collected and relocated prior to dewatering the work site. The project will result in 0.028 acres of permanent impacts to the river channel resulting from the increased width of the new bridge structure.

Typical equipment used to complete the project is expected to include the following: pavers and rollers, backhoes, bidwell and roller screeds, bobcats, bulldozers/loaders, compressors, concrete

[7] While not known at this time, it is expected that specific replanting ratios (e.g. 3:1) will be required as part of the anticipated permit requirements associated with a 1602 streambed alteration agreement, and 404 and 401 permits.
[8] The ultimate design and materials used to create the dewatering/diversion system will be at the discretion of the contractor.

pumps and truck mixers, cranes, dump trucks, excavators, pick-up trucks, front-end loaders, forklifts, graders, compactors, saw cutters, water trucks, and drill rigs.

Caltrans proposes to include several AMMs that will be implemented before, during, and after construction to prevent and minimize project-related effects to CCC coho salmon and CCC steelhead, and their critical habitat. These measures include working within the in-water work window of June 1 – October 15; ensuring proper handling and relocation of listed salmonids species during dewatering/diverting activities; ensuring establishment of revegetation areas; preventing introduction of contaminants into waterways; use of a debris containment system; ensuring complete removal and proper disposal of all construction waste; implementing erosion control measures; development of a fish handling and relocation plan, stormwater pollution prevention plan, a habitat restoration and revegetation plan, and a spill prevention control and countermeasure plan. For a full list of AMMs and additional BMPs please see Caltrans' Biological Assessment (2020).

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would not.

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 provide 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 an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably 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 as a whole for the conservation of a listed species" (50 CFR 402.02).

The designations of critical habitat for species uses the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced 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.

The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not change the scope of our analysis and in this opinion we use the terms "effects" and "consequences" interchangeably.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) directly or indirectly 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, or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.
- If necessary, suggest a reasonable and prudent alternative 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' "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 function of the PBFs that are essential for the conservation of the species.

2.2.1. Species Description and Life History

The biological opinion analyses the effects of the federal action on the following federally listed species (Distinct Population Segment [DPS] or Evolutionary Significant Unit [ESU]) and designated critical habitat:

Endangered Central California Coast (CCC) coho salmon ESU (*Oncorhynchus kisutch*)
Endangered (70 FR 37160; June 28, 2005)
Critical habitat (64 FR 24049; May 5, 1999);

Threatened Central California Coast (CCC) steelhead DPS (*Oncorhynchus mykiss*)
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005).

The CCC steelhead DPS includes steelhead in coastal California streams from the Russian River to Aptos Creek, and the drainages of Suisun, San Pablo, and San Francisco bays (72 FR 5248). The CCC coho salmon ESU includes coho from Punta Gorda in northern California south to, and including, Aptos Creek in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River System (61 FR 56138).

The action area is within designated critical habitat for CCC steelhead and CCC coho salmon. CCC steelhead critical habitat is designated from the Russian River to the San Lorenzo River to a lateral extent of ordinary high water in freshwater stream reaches, and to extreme high water in estuarine areas. CCC coho salmon critical habitat is designated to include all river reaches assessable to listed coho salmon from Punta Gorda in northern California south to the San Lorenzo River in central California, and includes Arroyo Corte Madera Del Presidio and Corte Madera Creek, tributaries to San Francisco Bay. Critical habitat consists of the water, substrate, and adjacent riparian zone of estuarine and riverine reaches (including off-channel habitats).

2.2.1.1. General Steelhead Life History

Steelhead are the anadromous form of *O. mykiss*, spawning in freshwater and migrating to marine environments to grow and mature. Steelhead have a complex life history that requires successful transition between life stages across a range of freshwater and marine habitats (i.e., egg-to-fry emergence, juvenile rearing, smolt outmigration, ocean survival, and upstream migration and spawning). Steelhead exhibit a high degree of life history plasticity (Shapovalov and Taft 1954; Thrower et al. 2004; Satterthwaite et al. 2009; Hayes et al. 2012). The occurrence and timing of these transitions are highly variable and generally driven by environmental conditions and resource availability (Satterthwaite et al. 2009; Sogard et al. 2012).

Steelhead are generally divided into two ecotypes based on timing and state of maturity when returning to freshwater: summer-run and winter-run. Summer-run steelhead return to natal streams in spring and early summer while they are still sexually immature and spend several months maturing before spawning in January and February (Nielson and Fountain 2006). Winter-run steelhead enter natal streams as mature adults with well-developed gonads. They typically immigrate between December and April and spawn shortly after reaching spawning

grounds (Shapovalov and Taft 1954; Moyle et al. 2008). Winter-run steelhead are the most common ecotype and are the only ecotypes expressed in the CCC steelhead DPS.

Adult steelhead spawn in gravel substrates with low sedimentation and suitable flow velocities. Females lay eggs in redds, where they are quickly fertilized by males and covered. Egg survival depends on oxygenated water circulating through the gravel, facilitating gas exchange and waste removal. Adults usually select spawning sites in pool-riffle transition areas of streams with gravel cobble substrates between 0.6 to 10.2 centimeters (cm) in diameter and flow velocities between 40-91 cm per second (Smith 1973; Bjornn and Reiser 1991). Eggs incubate in redds for approximately 25 to 35 days depending on water temperature (Shapovalov and Taft 1954). Incubation time depends on water temperature, with warmer temperatures leading to lower incubation periods due to increased metabolic rates. Eggs hatch as alevin and remain buried in redds for an additional two to three weeks until yolk-sac absorption is complete (Shapovalov and Taft 1954). Optimal conditions for embryonic development include water temperatures between 6 and 10°C, dissolved oxygen near saturation, and fine sediments less than 5% of substrate by volume (Bjornn and Reiser 1991; USEPA 2001).

Upon emerging from redds, juvenile steelhead occupy edgewater habitats where flow velocity is lower and cover aids in predator avoidance. Rearing juveniles feed on a variety of aquatic and terrestrial invertebrates. As they grow, juveniles move into deeper pool and riffle habitats where they continue to feed on invertebrates and have been observed feeding on younger juveniles (Chapman and Bjornn 1969; Everest and Chapman 1972). Juveniles can spend up to four years rearing in freshwater before migrating to the ocean as smolts, although they typically only spend one to two years in natal streams (Shapovalov and Taft 1954; Busby et al. 1996; Moyle 2002). Successful rearing depends on stream temperatures, flow velocities, and habitat availability. Preferred water temperature ranges from 12 to 19°C and sustained temperatures above 25°C are generally considered lethal (Smith and Li 1983; Busby et al. 1996; Moyle 2002; McCarthy et al. 2009). In Central California streams, juvenile steelhead are able to survive peak daily stream temperatures above 25°C for short periods when food is abundant (Smith and Li 1983). Response to stream temperatures can vary depending on the conditions to which individuals are acclimated, however, consistent exposure to high stream temperatures results in slower growth due to elevated metabolic rates and lower survival rates overall (Hokanson et al. 1977; Busby et al. 1996; Moyle 2002; McCarthy et al. 2009).

Juveniles undergo behavioral, morphological, and physiological changes in preparation for ocean entry, collectively called smoltification. Juveniles begin smoltification in freshwater and the process continues throughout downstream migration with some smolts using estuaries for further acclimation to saltwater prior to ocean entry (Smith 1990; Hayes et al. 2008). Juveniles typically will not smolt until reaching a minimum size of 160 mm (Burgner et al. 1992). Smoltification is cued by increasing photoperiod. Stream temperatures influence the rate of smoltification, with warmer temperatures leading to more rapid transition. Downstream migration of smolts typically occurs from April to June when temperature and stream flows increase. Preferred temperature for smoltification and outmigration is between 10 and 17°C with temperatures below 15°C considered optimal (Hokanson et al. 1977; Wurtsbaugh and Davis 1977; Zedonis and Newcomb

1997; Moyle 2002; Myrick and Cech 2005). In coastal systems with seasonal lagoons, smolts may take advantage of higher growth potential in productive lagoon habitats before ocean entry (Osterback et al. 2018).

Adult steelhead are known to be highly migratory during ocean residency but little is known of their habitat use and movements. They have been observed moving north and south along the continental shelf, presumably to areas of high productivity to feed (Barnhart 1986). Adults will typically spend one to two years in the ocean, feeding and growing in preparation for spawning (Shapovalov and Taft 1954; Busby et al. 1996). Upstream migration typically begins once winter rains commence and stream flows increase. For coastal systems with seasonal freshwater lagoons, winter storms are required to breech the sandbars and allow access to upstream spawning sites. Within the action area, steelhead migrate through large, permanently open bays; CCC steelhead migrate through San Francisco Bay and Monterey Bay, respectively. Unlike most congenerics, steelhead are iteroparous, meaning they can return to spawn multiple times. Adult steelhead may spawn up to four times in their lifetime, although spawning runs predominantly consist of first-time spawners (~59%) (Shapovalov and Taft 1954). The maximum life span of steelhead is estimated to be nine years (Moyle 2002).

2.2.1.2. General Coho Salmon Life History

The life history of the coho salmon in California has been well documented (Shapovalov and Taft 1954; Hassler 1987; Weitkamp et al. 1995). In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple three year life cycle. Adult salmon typically begin the immigration from the ocean to their natal streams after heavy late-fall or winter rains breach the sand bars at the mouths of coastal streams (Sandercock 1991). Coho salmon are typically associated with small to moderately-sized coastal streams characterized by heavily forested watersheds; perennially-flowing reaches of cool, high quality water; dense riparian canopy; deep pools with abundant overhead cover; instream cover consisting of large, stable woody debris and undercut banks; and gravel or cobble substrates (Sandercock 1991). Immigration continues into March, generally peaking in December and January, with spawning occurring shortly after arrival at the spawning ground (Shapovalov and Taft 1954).

When in freshwater, optimal habitats for successful coho include adequate quantities of: (1) deep complex pools formed by large woody debris; (2) adequate quantities of water; (3) cool water temperatures [when maximum weekly average water temperatures exceed 18°C Coho salmon are absent from otherwise suitable rearing habitat (Welsh et al. 2001); temperatures between 12-14° C are preferred; and the upper lethal limit is between 25-26°C.]; (4) unimpeded passage to spawning grounds (adults) and back to the ocean (smolts); (5) adequate quantities of clean spawning gravel; and (6) access to floodplains, side channels and low velocity habitat during high flow events. Numerous other requirements exist (*i.e.*, adequate quantities of food, dissolved oxygen, low turbidity, *etc.*), but in many respects these other needs are generally met when the six freshwater habitat requirements listed above are at a properly functioning condition.

The eggs generally hatch after four to eight weeks, depending on water temperature. Survival and development rates depend, in part, on fine sediment levels within the redd. Under optimum conditions, mortality during this period can be as low as 10 percent; under adverse conditions of high scouring flows or heavy siltation, mortality may be close to 100 percent (Baker and Reynolds 1986). McMahon (1983) found that egg and fry survival drops sharply when fines make up 15 percent or more of the substrate. The newly-hatched fry remain in the redd from two to seven weeks before emerging from the gravel (Shapovalov and Taft 1954). Upon emergence, fry seek out shallow water, usually along stream margins. As they grow, juvenile coho salmon often occupy habitat at the heads of pools, which generally provide an optimum mix of high food availability and good cover with low swimming cost (Nielsen 1992). In the spring, as yearlings, juvenile coho salmon undergo a physiological process, or smoltification, which prepares them for living in the marine environment. Emigration timing is correlated with precipitation events and peak upwelling currents along the coast. Entry into the ocean at this time facilitates more growth and, therefore, greater marine survival (Holtby et al. 1990).

2.2.2. Status of the Listed Species

NMFS assesses four population viability[9] parameters to discern the status of the listed ESUs and DPSs and to assess each species ability to survive and recover. These population viability parameters are: abundance, population growth rate, spatial structure, and diversity (McElhany et al. 2000). While there is insufficient data to evaluate these population viability parameters quantitatively, NMFS has used existing information to determine the general condition of the populations in the CCC steelhead DPS, the CCC coho salmon ESU, and factors responsible for the current status of these listed species.

The population viability parameters are used as surrogates for numbers, reproduction, and distribution, as defined in the regulatory definition of jeopardy (50 CFR 402.20). For example, abundance, population growth rate, and distribution are surrogates for numbers, reproduction, and distribution, respectively. The fourth parameter, diversity, is related to all three regulatory criteria. Numbers, reproduction, and distribution are all affected when genetic or life history variability is lost or constrained, resulting in reduced population resilience to environmental variation at local or landscape-level scales.

2.2.2.1. CCC Steelhead DPS

Historically, approximately 70 populations of steelhead existed in the CCC steelhead DPS (Spence et al. 2008; Spence et al. 2012). Approximately 37 of these populations were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts (Bjorkstedt et al. 2005). The remaining populations were dependent upon immigration from nearby CCC steelhead DPS populations to ensure their viability (McElhaney et al. 2000; Bjorkstedt et al. 2005).

[9] NMFS defines a viable salmonid population as "an independent population of any Pacific salmonid (genus *Oncorhynchus*) that has a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100- year time frame" (McElhany et al. 2000).

Abundance data for CCC steelhead are limited; however, existing information indicates population abundances have been substantially reduced from historical levels. In the mid-1960's, a total of 94,000 adult steelhead were estimated to spawn in CCC steelhead rivers, including 50,000 fish in the Russian River, the largest population in the DPS (Busby et al. 1996). Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with recent estimates for several streams (Lagunitas, Waddell, Scott, San Vicente, Pudding, and Caspar creeks) at individual run sizes of 500 fish or less (62 FR 43937). Some loss of genetic diversity has been documented and attributed to previous among-basin transfers of stock and local hatchery production in interior populations in the Russian River (Bjorkstedt et al. 2005). In San Francisco Bay streams, reduced population sizes and habitat fragmentation has likely also led to loss of genetic diversity in these populations. For more detailed information on trends in CCC steelhead abundance, see: Busby et al. 1996; Good et al. 2005; Spence et al. 2008; Williams et al. 2011; and Williams et al. 2016.

CCC steelhead have experienced serious declines in abundance and long-term population trends suggest a negative growth rate, indicating the DPS may not be viable in the long-term. DPS populations that historically provided enough steelhead immigrants to support dependent populations may no longer be able to do so, thereby putting dependent populations at increased risk of extirpation. Recent status reviews and return data indicate an ongoing potential for the DPS to become endangered in the future (Good et al. 2005). In 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834). A CCC steelhead viability assessment completed in 2008 concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable, and that the limited information available did not indicate that any other CCC steelhead populations could be demonstrated to be viable (Spence et al. 2008).

In the Santa Cruz Mountains, the California Coastal Monitoring Program (CMP) has been recently initiated for CCC steelhead. New information from three years of the CMP indicates that population sizes there are perhaps higher than previously thought. However, the long-term downward trend in the Scott Creek population, which has the most robust estimates of abundance, is a source of concern. Although steelhead occur in the Russian River, the ratio of hatchery fish to natural origin fish remains a concern. The viability of San Francisco Bay watershed populations remains highly uncertain. Population-level estimates of adult abundance are not available for any of the seven independent populations inhabiting the watersheds of the coastal strata (Novato Creek, Corte Madera Creek, Guadalupe River, Saratoga Creek, Stevens Creek, San Francisquito Creek, and San Mateo Creek). The scarcity of information on CCC steelhead abundance continues to make it difficult to assess whether conditions have changed appreciably since the previous status review assessment of Williams et al. (2011). On May 26, 2016, NMFS chose to maintain the threatened status of the CCC steelhead (81 FR 33468).

2.2.2.2. CCC Coho Salmon ESU

Historically, the CCC coho salmon ESU was comprised of approximately 76 coho salmon populations. Most of these were dependent populations that needed immigration from other

nearby populations to ensure their long-term survival. Historically, there were 11 functionally independent populations and 1 potentially independent population of CCC coho salmon (Spence et al. 2008, Spence et al. 2012). Most of the populations in the CCC coho salmon ESU are currently doing poorly as a result of low abundance, range constriction, fragmentation, and loss of genetic diversity, as described below.

Brown et al. (1994) estimated that annual spawning numbers of coho salmon in California ranged between 200,000 and 500,000 fish in the 1940s, which declined to 100,000 fish by the 1960s, followed by a further decline to 31,000 fish by 1991. More recent abundance estimates vary from approximately 600 to 5,500 adults (Good et al. 2005). Recent status reviews (Williams et al. 2011) indicate that the CCC coho salmon are likely continuing to decline in number. CCC coho salmon have also experienced acute range restriction and fragmentation. Adams et al. (1999) found that in the mid 1990's coho salmon were present in 51 percent (98 of 191) of the streams where they were historically present, and documented an additional 23 streams within the CCC coho salmon ESU in which coho salmon were found for which there were no historical records. Recent genetic research has documented reduced genetic diversity within subpopulations of the CCC coho salmon ESU (Bjorkstedt et al. 2005). The influence of hatchery fish on wild stocks has likely also contributed to the lack of diversity through outbreeding depression and disease.

Available data from the few remaining independent populations suggests population abundance continues to decline, and many independent populations that in the past supported the species overall numbers and geographic distributions have been extirpated. This suggests that populations that historically provided support to dependent populations via immigration have not been able to provide enough immigrants for many dependent populations for several decades. The near-term (10 - 20 years) viability of many of the extant independent CCC coho salmon populations is of serious concern. These populations may not have enough fish to survive additional natural and human caused environmental change.

The two conservation hatchery programs are the Don Clausen Coho Salmon Conservation Program on the Russian River in Sonoma County, California, and the smaller Kingfisher Flat Hatchery on Scott Creek, Santa Cruz County, California. While differing in size and funding, both programs were initiated in 2001 in response to severely depressed coho salmon abundances. Fish are collected from the wild, brought into the hatcheries, genetically tested, and spawned to maximize diversity and prevent inbreeding. In the hatchery, fish are raised to various ages, fed krill, tagged, and released into streams throughout the watersheds. This release strategy allows the fish to imprint on the creek with the aim that they will return to these streams as adults so they can spawn naturally. Juvenile coho salmon and coho salmon smolts have been released into several Russian River tributaries and coastal watersheds in San Mateo and Santa Cruz counties.

None of the five diversity strata defined by Bjorkstedt et al. (2005) currently support viable coho salmon populations. According to Williams et al. (2016), recent surveys suggest CCC coho abundance has improved slightly since 2011 within several independent populations (mainly north of SF bay), although all populations remain well below their high-risk dispensation

thresholds identified by Spence et al. (2008). The Russian River and Lagunitas Creek populations are relative strongholds for the species compared to other CCC ESU populations, the former predominantly due to out-planting of hatchery-reared juvenile fish from the Russian River Coho Salmon Broodstock Program. The most recent status review (NMFS 2016) documents conditions for CCC coho salmon have not improved since the last status review in 2011 (Williams et al. 2016. The overall risk of CCC coho salmon extinction remains high, and the most recent status review reaffirmed the ESU's endangered status (NMFS 2016). NMFS's recovery plan (NMFS 2012) for the CCC coho salmon ESU identified the major threats to population recovery. These major threats include roads, water diversions and impoundments, and residential development.

2.2.3. Status of CCC Steelhead and CCC Coho Salmon Critical Habitat

In designating critical habitat, NMFS considers the following requirements of the species: 1) space for individual and population growth and for normal behavior; 2) food, water, air, light, minerals, or other nutritional or physiological requirements; 3) cover or shelter; 4) sites for spawning, reproduction, and rearing offspring; and, generally 5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on PBFs and/or essential habitat types within the designated area that are essential to the conservation or protection of the species (81 FR 7414).

PBFs for CCC steelhead critical habitat and their associated essential features within freshwater include:

1. freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development;
2. freshwater rearing sites with:
    a) water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
    b) water quality and forage supporting juvenile development; and
    c) natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks;
3. freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

PBFs for CCC steelhead critical habitat, and their associated essential features within estuarine areas include: areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and

boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

For CCC coho salmon critical habitat, the following essential habitat types were identified: 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. PBFs for coho salmon include adequate (64 FR 24049): (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 (64 FR 24049).

The condition of CCC steelhead, and CCC coho salmon critical habitat, specifically its ability to provide for their 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[10]: logging, urban and agricultural land development, mining, stream channelization, and bank stabilization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Habitat impacts of concern include altered streambank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality/quantity, lost riparian vegetation, and increased sediment delivery into streams from upland erosion (Weitkamp *et al.* 1995; Busby et al. 1996; 64 FR 24049; 70 FR 37160; 70 FR 52488). Based on NMFS familiarity with the landscapes in which these critical habitats occur, these impacts continue to persist today. Widespread diverting of rivers and streams, as well as the pumping of groundwater hydraulically connected to stream flow, has dramatically altered the natural hydrologic cycle in many of the streams within the CCC steelhead DPSs, and CCC coho ESU which can delay or preclude migration and dewater aquatic habitat. Stream channelization, commonly caused by streambank hardening and stabilization, represents a very high threat to instream and floodplain habitat throughout much of the designated critical habitat for both species, as detailed within the CCC coho salmon and CCC steelhead recovery plans (NMFS 2012 and 2016, respectively). Streambank stabilization confines stream channels and precludes natural channel movement, resulting in increased streambed incision, reduced habitat volume and complexity. Overall, the current condition of CCC steelhead and CCC salmon critical habitat is degraded, and does not provide the full extent of conservation value necessary for the recovery of the species.

The CZU Lightening Complex started as a series of lightening fires on August 16, 2020 across western Santa Cruz and San Mateo counties (California Department of Forestry and Fire Protection and California Department of Conservation 2020). The fire was fully contained on September 22, 2020; a total of 86,509 acres burned. Portions of the burned area represented some of the highest quality habitat for salmonids south of San Francisco (Casagrande pers com. 2020). The long-term impacts on such valuable salmonid habitat are yet to be determined. However,

[10] Other factors, such as over fishing and artificial propagation have also contributed to the current population status of these species. All these human induced factors have exacerbated the adverse effects of natural environmental variability from such factors as drought and poor ocean productivity.

there is heightened concern related to increased sediment run-off and erosion, decreased riparian vegetation, increased stream temperatures, and decreased water quality. There has not been significant rainfall in the burned areas since these fires, nor detailed habitat inventories, but it is likely CCC steelhead and CCC coho salmon spawning, rearing, and migratory habitat was directly impacted by the fires, and may be affected by future rain events.

2.2.4. Additional Threats to CCC steelhead and CCC coho salmon Critical Habitat

Another factor affecting the rangewide status of CCC coho salmon and steelhead, and aquatic habitat at large, is climate change. Global climate change presents an additional potential threat to salmonids and their critical habitats. Impacts from global climate change are already occurring in California. For example, average annual air temperatures, heat extremes, and sea level have all increased in California over the last century (Kadir et al. 2013). Snow melt from the Sierra Nevada has declined (Kadir et al. 2013). However, total annual precipitation amounts have shown no discernable change (Kadir et al. 2013). Listed salmonids may have already experienced some detrimental impacts from climate change. NMFS believes the impacts on listed salmonids to date are likely fairly minor because natural, and local, climate factors likely still drive most of the climatic conditions salmonids experience, and many of these factors have much less influence on salmonid abundance and distribution than human disturbance across the landscape.

The threat to salmonids from global climate change will increase in the future. Modeling of climate change impacts in California suggests that average summer air temperatures are expected to continue to increase (Lindley et al. 2007, Moser et al. 2012). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe et al. 2004, Moser et al. 2012, Kadir et al. 2013). Total precipitation in California may decline; critically dry years may increase (Lindley et al. 2007, Schneider 2007, Moser et al. 2012). Wildfires are expected to increase in frequency and magnitude (Westerling et al. 2011, Moser et al. 2012).

For Northern California, most models project heavier and warmer precipitation. Extreme wet and dry periods are projected, increasing the risk of both flooding and droughts (California Department of Water Resources 2013). Estimates show that snowmelt contribution to runoff in the Sacramento/San Joaquin Delta may decrease by about 20 percent per decade over the next century (Cloern et al. 2011). Many of these changes are likely to further degrade CCC coho salmon and steelhead habitat by, for example, reducing streamflows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to salmonids. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia et al. 2002, Ruggiero et al. 2010). In marine environments, ecosystems and habitats important to juvenile and adult salmonids are likely to experience changes in temperatures, circulation, water chemistry, and food supplies (Brewer and Barry 2008, Feely 2004, Osgood 2008, Turley 2008, Abdul-Aziz et al. 2011, Doney et al. 2012). The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007, Santer et al. 2011).

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 includes two locations within the San Lorenzo River watershed in Santa Cruz County, California that are approximately two river miles away from each other. Kings Creek enters the San Lorenzo River approximately 350 feet downstream of the Kings Creek Bridge location. The action area includes areas that may be affected by stream diversion, fish capture and relocation, and construction activities; including the riverbed, banks, riparian corridor, and adjacent storage areas above top of bank adjacent to the river channel.

2.3.1. San Lorenzo River Bridge Replacement

The action area includes a maximum of 82 linear feet of the San Lorenzo River that will be dewatered for construction purposes, and approximately 100 feet of the San Lorenzo River channel immediately downstream of the dewatered area where temporary construction effects may occur.

2.3.2. Kings Creek Bridge Replacement

The action area includes a maximum of 79 linear feet of the Kings Creek that will be dewatered for construction purposes, and approximately 100 feet of Kings Creek channel immediately downstream of the dewatered area where temporary construction effects may occur.

2.4. Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. 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 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

The San Lorenzo River is the largest coastal watershed in Santa Cruz County, encompassing approximately 138 square miles. About 62 percent of the San Lorenzo River watershed is coniferous forest and about 22 percent of the watershed area is either shrub or grasslands; the remaining 16 percent is urban development. The climate is Mediterranean, with over 90 percent of annual precipitation occurring between November and April. Major land uses in the upper watershed are forest, open land, logging, recreation, agriculture, rural residential, while the lower watershed is more urbanized (e.g., City of Santa Cruz) and supports residential development, and tourism (NMFS 2016). Flow from the San Lorenzo River watershed, along with groundwater resources, provides up to 80 percent of the water supply for the city of Santa Cruz system and is a key supply for the communities of the San Lorenzo Valley.

2.4.1. Status of Listed CCC Steelhead and CCC Coho Salmon in the Action Area

Results from long-term fisheries surveys conducted within the San Lorenzo watershed (County of Santa Cruz 2018; DWAA 2006, 2007, 2008, 2015) provide good information (as described below) for inferring the status of CCC steelhead and CCC coho salmon within the action area, and inform the following assessment of the status of CCC steelhead and CCC coho salmon within the action area.

2.4.1.1. CCC Steelhead in the Action Area

The San Lorenzo River steelhead population is considered a very important population within the watershed and DPS (NMFS 2016). The San Lorenzo River is the largest watershed is the Santa Cruz Mountains Diversity Stratum (NMFS 2016).[11] This population is functionally independent and likely provides frequent dispersal to nearby smaller coastal populations (NMFS 2016a). Recovery criteria for the CCC steelhead San Lorenzo River population is a spawner density target of 3,200 (as described in NMFS 2016).

CCC steelhead are present in most of Santa Cruz County's streams that are accessible from the ocean, including the San Lorenzo River and Kings Creek. The County of Santa Cruz is a partner of the Juvenile Salmonid and Stream Habitat Monitoring (JSSHM) program that collects data on juvenile salmonid densities within Santa Cruz County, including the San Lorenzo River. One of the long-term collection sites is located approximately 0.3 miles south of the San Lorenzo River Bridge at the confluence of the San Lorenzo River and Bear Creek (DWAA 2019, [Figure 1]). Electrofishing surveys at this long-term site from 1981, 1994-2001, 2003-2005, and 2014-2018 yielded densities that ranged between 0.70 and 69.70 fish per 100 feet of creek, with an average density of 25.96 fish per 100 feet (County of Santa Cruz 2018).

Data from an additional long-term collection site within the JSSHM program exists approximately 350 feet south of Kings Creek Bridge, located at the confluence of Kings Creek and the San Lorenzo River (DWAA 2018, [Figure 1]). Electrofishing surveys at this long-term site from 1981, 1994-2001, 2003-2005, and 2013-2018 yielded densities that ranged between 2.1 and 126.80 fish per 100 feet of creek, with an average density of 33.43 fish per 100 feet (County of Santa Cruz 2018).

Given the regular presence of steelhead within the action area, CCC steelhead are expected to occur in the action area year round. With the proposed in-water work window of June 1 to October 15, juvenile CCC steelhead are expected to be present within the action area during the proposed summer work window.

[11] The Central California Coast (CCC) steelhead Distinct Population Segment (DPS) consists of five Diversity Strata with 38 independent populations of winter-run steelhead (12 functionally independent and 26 potentially independent) and 22 dependent populations. The delineation of the CCC steelhead DPS Diversity Strata was based on environmental and ecological similarities and life history. Five strata were identified as North Coastal, Interior, Santa Cruz Mountains, Coastal San Francisco Bay, and Interior San Francisco Bay (for more information, see NMFS 2016).

2.4.1.2. CCC Coho Salmon in the Action Area

Historically, coho salmon were believed to inhabit all or most of the accessible coastal streams in Santa Cruz County. By the 1960's coho salmon were believed present in seven stream systems in Santa Cruz County including the San Lorenzo River System (Bryant 1994). Aptos Creek is the southern boundary of the CCC ESU. While small numbers of wild *O. kisutch* have been observed in the trap at the Felton Diversion Dam in recent years (e.g., one adult coho in the 2012/2013 trapping year), juvenile coho salmon were last captured at two electrofishing sites on Bean Creek in 2005; that same year, two juvenile coho salmon were captured in Zayante Creek near the confluence with Bean Creek (Hagar 2005) and observed in Bean Creek during snorkel surveys conducted by NMFS staff (DWAA 2019). CCC coho salmon have not been observed in the middle mainstem San Lorenzo River since salmonid monitoring by DWAA began in 1994 (DWAA 2019), and the population is at an extreme risk of extirpation (NMFS 2012).

Based on the apparent absence of the CCC coho salmon from the middle mainstem of the San Lorenzo River, the species has an exceedingly low likelihood of occurrence in both portions of the action area at the time of project construction. With the proposed in-water work window of June 1 to October 15, only juvenile CCC coho would be expected to be present within the action area during the proposed summer work window, if they are present at all.

2.4.2. Status of Critical Habitat in the Action Area

The action area is designated critical habitat for CCC steelhead and CCC coho salmon, and supports spawning, rearing, and migration of these listed species. Essential features include substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. The principle factors responsible for current steelhead and salmon habitat conditions in the action area are described below and are organized by the major factors responsible for current habitat conditions: water diversions, sedimentation, loss of riparian vegetation and large woody debris from streams, and climate change. While the action area comprises a very small portion of the San Lorenzo River Watershed, these factors have likely reduced available spawning and rearing habitat for steelhead and coho salmon in the action area.

Designated critical habitat within the action area is moderately degraded from a properly functioning condition. Water diversions and resulting decreases in stream flow are a limiting factor for fisheries in the action area (NMFS 2012). Depletion and diversion of natural flows have altered natural hydrological cycles, and subsequent flows, in most streams inhabited by CCC steelhead and CCC coho salmon in Santa Cruz County. Reduction of flows negatively affect salmonid habitat by loss of usable habitats due to dewatering and blockage, stranding of fish resulting from rapid flow fluctuations; migration delays, entrainment of juveniles into unscreened or poorly screened diversions, and increased lethal and sublethal effects resulting from increased water temperatures (Bergren and Filardo 1993, Chapman and Bjornn 1968). Reduced flows degrade or diminish fish habitats via increased deposition of fine sediments in spawning gravels, decreased recruitment of new spawning gravels, and encroachment of riparian and non-endemic vegetation into spawning and rearing areas.

As described in the CCC steelhead and CCC coho salmon recovery plans, road densities are high throughout the San Lorenzo River watershed (NMFS 2016; NMFS 2012). Road densities are estimated at 5.3 miles of road per square mile of watershed area, and at 6.2 miles per square mile of riparian area. Roads were determined as a primary sediment source, including private, public, and timber harvest roads. The periodic grading and leveling of unsurfaced roads continuously expose erodible material both on the road surface and along the road shoulders. This loose, unconsolidated material is frequently mobilized during winter storms when it enters the water column. Many of these roads have areas that fail recurrently at the same unstable locations. These reoccurring bank failures contribute to ongoing instream sedimentation and often are addressed by bank hardening. Stabilization of banks along road corridors, without reestablishment of riparian vegetation, furthered additional bank instability and increased rates of sediment input.

Aquatic habitats in the San Lorenzo River watershed, including the action area, have deteriorated considerably from historical conditions (Santa Cruz Planning Department 1979) due to increased rates of sediment input into the river. The high rates of sediment input have impaired salmonid spawning, feeding, and rearing habitats by burying spawning gravels, disrupting invertebrate (salmonid food) production, and filling in pools needed by salmonids for thermal and predator refuge. Elevated rates of fine sediment input are considered by many fisheries experts to be the primary limiting factor to salmonid production in the San Lorenzo River watershed, including portions of the action area (DWAA 2004).

Other impacts of roads include changes and losses to riparian vegetation and structure that lead to ongoing impacts to water quality. Many of the streams in the County have reduced riparian complexity, and most have gaps in the riparian corridor. Santa Cruz County had been conducting logjam removal at the request of streamside property owners starting in the 1970s.[12] The purpose of cutting up large woody material in the past was to prevent or reduce potential flooding and bank erosion to adjoining property owners. Lasserette (2003) indicates the majority of large woody debris (LWD) in the County has accumulated in connection with infrastructure such as bridges, culverts, and road crossings because many were designed and constructed without consideration of passing large wood. Few remaining watersheds in the County, including the San Lorenzo, retain the appropriate levels of large wood to sustain various life stages of salmonids (NMFS 2012). Riparian vegetation clearing has not been limited to County operations; private landowners have cleared riparian vegetation with or without County approval.

Modifications to riparian corridors have reduced salmonid carrying capacity. Wood in and over streams creates cover from predators, and large woody debris often results in the localized scour of deep pools that provide salmonids thermal refuge and hiding places from predators (Dolloff 1983). The loss of riparian vegetation removes cover for fish over streams, and reduces the amount of wood that enters stream channels from tree death, wind-throw, and bank erosion. The result is a reduction in a stream's carrying capacity for juvenile fish, particularly coho salmon (Glova 1978). In the CCC coho salmon ESU, watersheds that have increased agricultural and/or

[12] Santa Cruz Board of Directors Flood Control and Water Conservation District Resolution NO. 417-71.

urban development also have depressed populations of coho salmon (NMFS 2010 and 2012) in large part due to the removal or reduction of large wood elements in stream channels and floodplains. The river flows through the action area in highly confined valleys with steep bedrock slopes, and the right bank within the Kings Creek portion of the action area is armored with sacked concrete. Tree species in the area are coast redwood, red alder, sycamore, tanoak, and coast redwood trees. Additional vegetation is a mix of non-native, invasive Himalayan blackberry, English ivy, and thimbleberry. Overall, vegetation within the action are is sparse, to lacking, due to the aforementioned banks; although a healthy canopy of trees exists above the OHWM. Both reaches of the river are comprised of deep pools, cobble substrate, and fine sediments that likely result from the surrounding steep bedrock slopes.

The long-term effects of climate change have been presented above, and include temperature and precipitation changes that may affect steelhead, coho salmon, and critical habitat by changing water quality, streamflow levels, and salmonid migration in the action area. The threat to salmonids in in the action area from climate change is likely going to mirror what is expected for the rest of Central California. NMFS expects that average summer air temperatures in the action area would continue to increase, heat waves would become more extreme, and droughts and wildfire would occur more often (Lindley et al. 2007, Hayhoe et al. 2004, Moser et al. 2012; Kadir et al. 2013, Schneider 2007, Westerling et al. 2011). Many of these changes are likely to further degrade CCC steelhead and CCC coho salmon critical habitat throughout the action area by, for example, reducing streamflow during the summer and raising summer water temperatures.

As noted above, the CZU Lightening Complex burned 86,509 acres. The action area lies just east of the fire's perimeter (California Department of Forestry and Fire Protection and California Department of Conservation 2020 [Figure 3]), and therefore did not experience direct impacts to critical habitat (i.e. loss of soil cover, vegetation and canopy, soil heating, etc.). However, there is potential for critical habitat within the San Lorenzo River watershed, including the action area, to be indirectly impacted by post-fire debris flows guided eastward as a result of surrounding topography and geology (California Department of Forestry and Fire Protection and California Department of Conservation 2020). There has not been significant rainfall on the San Lorenzo watershed since these fires, and so the current exposure of listed salmonids in the action area to the effects of these fires is likely negligible. With a significant rain event, debris flows may occur and could impact critical habitat through increased sedimentation, contaminants, and pollutants, and/or removal of riparian vegetation.

2.4.3. Previous Section 7 Consultations and Section 10(a)(1)(A) Permits in the Action Area

Although no previous individual section 7 consultation with NMFS have occurred within the action area of the projects, NMFS has completed programmatic consultations for salmonid habitat restoration actions that include the action area of this project. These programmatic consultations include the NOAA Restoration Center's restoration program, the Corps' Regional General Permit #12 programmatic consultation, and the Santa Cruz Countywide Partners in Restoration Permit Coordination Program (Program). These consultations anticipate a limited

amount of take for juvenile salmonids during instream work conducted in the summer months. NMFS determined these restoration actions are likely to improve habitat conditions for listed species and that the limited amount of take anticipated is unlikely to affect future adult returns.

In addition to the above, NMFS also conducted a programmatic consultation, the Large Woody Material Management Program in Santa Cruz County, where the proposed suite of activities was likely to adversely affect ESA-listed fish species or critical habitat, which resulted in a programmatic biological opinion.

NMFS' Section 10(a)(1)(A) research and enhancement permits and section 4(d) limits or exceptions could potentially occur in any of the watersheds covered under this Program, including the reaches within the action area. Salmonid monitoring approved under these programs includes carcass surveys, smolt outmigration trapping, and juvenile density surveys. In general, these activities are closely monitored and require measures to minimize take during the research activities. NMFS determined these research projects are unlikely to affect future adult returns.

2.5. Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

In this biological opinion, our approach to determine the effects of the action was based on institutional knowledge and a review of the ecological literature and other relevant materials. We used this information to gauge the likely effects of the proposed suite of projects using an exposure and response framework that focuses on the stressors (physical, chemical, or biological), directly or indirectly caused by the proposed action, to which CCC steelhead and CCC coho salmon are likely to be exposed. Next, we evaluate the likely response of the above listed fish to these stressors in terms of changes to survival, growth, and reproduction, and changes to the ability of PBFs to support the value of critical habitat in the action area. PBFs include sites essential to support one or more life stages of the species. These sites for migration, spawning, and rearing, in turn, contain physical and biological features that are essential to the conservation of the species. Where data to quantitatively determine the effects of the proposed action on listed fish and their critical habitat were limited or not available, our assessment of effects focused mostly on qualitative identification of likely stressors and responses.

Construction activities, both during and post-project completion, associated with the proposed project may affect CCC steelhead, CCC coho salmon, and their designated critical habitat. The following may result from construction activities: unintentional direct injury or mortality during fish collection, relocation, and dewatering activities; temporary loss of benthic habitat;

reductions in riparian vegetation and cover; temporary increases in suspended sediments; and temporary and minor increases in hazardous materials and contaminants from heavy machinery and construction materials.

2.5.1. Fish Collection and Relocation

To facilitate the completion of the project, portions of the San Lorenzo River and Kings Creek will need to be dewatered. As discussed above, a maximum amount of 82 and 79 linear feet will be dewatered, respectively. The project proposes to collect and relocate fish in the work area prior to, and during dewatering to avoid fish stranding and exposure to construction activities. Before and during dewatering of the construction site, juvenile salmonids will be captured by a qualified biologists using one of more of the following methods: dip net, seine, thrown net, block net, minnow trap, and electrofishing. Collected salmonids will be relocated to an appropriate stream reach that will minimize impacts to captured fish, and to fish that are already residing at the release site. Since construction is scheduled to occur between June 1 and October 15, relocation activities will occur during the summer low-flow period after emigrating smolts have left and before adults have immigrated for spawning. Only juvenile salmonids are expected to be in the action area during the construction period. Therefore, NMFS expects capture and relocation of listed salmonid species will be limited to pre-smolting and young-of-the-year juveniles.

Fish collection and relocation activities pose a risk of injury or mortality to rearing juvenile salmonids. Any fish collecting gear, whether passive (Hubert 1996) or active (Hayes et al. 1996) has some associated risk to fish, including stress, disease transmission, injury, or death. The amount of unintentional injury and mortality attributable to fish capture varies widely, depending on the method used, the ambient conditions, and the expertise and experience of the field crew. Since fish relocation activities will be conducted by qualified fisheries biologists following NMFS electrofishing guidelines (NMFS 2000), injury and mortality of juvenile salmonids during capture and relocation will be minimized. Based on prior experience with current relocation techniques and protocols likely to be used to conduct the fish relocation, unintentional mortality of listed juvenile salmonids expected from capture and handling procedures is not likely to exceed 2 percent.

Relocated fish may also have to compete with other fish causing increased competition for available resources such as food and habitat. To reduce the potential for competition, fish relocation sites will be pre-approved by NMFS to ensure the sites have adequate habitat to allow for survival of transported fish and fish already present. Nonetheless, crowding could occur which would likely result in increased inter- and intraspecific competition at those sites. Responses to crowding by salmonids include self-thinning, resulting in emigration and reduced salmonid abundance with increased individual body size within the group, and/or increased competition (Keeley 2003). Relocation sites will be selected to ensure they have similar water temperatures as the capture sites, and adequate habitat to allow for survival of transported fish and fish already present. However, some of the fish released at the relocation sites may choose not to remain in these areas and move either upstream or downstream to areas that have more

vacant habitat and a lower density of fish. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. In some instances, relocated fish may endure some short-term stress from crowding at the relocation sites. Such stress is not likely to be sufficient to reduce their individual fitness or performance. NMFS cannot accurately estimate the number of fish likely to be exposed to competition, but does not expect this short-term stress to reduce the individual performance of juvenile salmonids, or cascade through the watershed population of these species. Fish that avoid capture during relocation may be exposed to risks described in the following section on dewatering (see Section 2.5.2 below).

To estimate the number of juvenile steelhead that may be present in the San Lorenzo River portion of the action area, we used data described in Section 2.4.1.1 above from surveys performed by the County of Santa Cruz and DWAA within the San Lorenzo River watershed. Using the 16-year average of the density data described above, 25.96 juvenile steelhead can be expected to be encountered in a dewatered reach of 100 linear feet. Using this data, and the proposed dewatered length of 82 linear feet, NMFS estimates that no more than 22 juvenile steelhead will be present in the dewatered area when relocation and dewatering activities occur during each construction each year.[13] Considering environmental variability such as interannual variation in temperature, variations in predator or prey abundance, habitat conditions in the action area, and other factors, NMFS assumes that as many as 25 percent more juvenile steelhead may be present in the area to be dewatered each year. The 25 percent increase is based on NMFS' best professional judgement as to the likely variability in steelhead density during the three years needed to complete the project. If 25 percent more than 22 juvenile CCC steelhead are present, this would result in 28 juvenile CCC steelhead present in the 82-foot-dewatered area during each dewatering event.[14] Considering the proposed maximum of three dewatering events that might be necessary to complete the work, this would result in 84 juvenile CCC steelhead present in the dewatered area over the term of the project.[15]

To estimate the number of juvenile steelhead that may be present in the Kings Creek portion of the action area, we used data described in Section 2.4.1.1 above from surveys performed by the County of Santa Cruz and DWAA within the San Lorenzo River watershed. Using the 17-year average of the density data described above, 33.43 juvenile steelhead are expected to be encountered in a dewatered reach of 100 linear feet. Using this data, and the proposed dewatered length of 79 linear feet, NMFS estimates that no more than 27 juvenile CCC steelhead will be present in the dewatered area when relocation and dewatering activities occur during construction each year.[16] Considering environmental variability such as interannual variation in temperature, variations in predator or prey abundance, habitat conditions in the action area, and

[13] (25.96 juvenile steelhead*82 linear feet dewatered)/100 linear feet = 21.29 juvenile steelhead/100 linear feet, or 22 juvenile steelhead/100 linear feet when rounding up.
[14] ((22 juvenile steelhead/100 linear feet*0.25) + 22 juvenile steelhead) = 27.50 juvenile steelhead/100 linear feet, or 28 juvenile steelhead/100 linear feet when rounding up.
[15] 28 juvenile steelhead/100 linear feet*3 dewatering events = 84 juvenile steelhead/100 linear feet.
[16] (33.43 juvenile steelhead*79 linear feet dewatered)/100 linear feet = 26.41 juvenile steelhead/100 linear feet, or 27 juvenile steelhead/100 linear feet when rounding up.

other factors, NMFS assumes that as many as 25 percent more juvenile CCC steelhead may be present in the area to be dewatered each year. The 25 percent increase is based on NMFS' best professional judgement as to the likely variability in CCC steelhead density during the three years needed to complete dewatering. If 25 percent more than 27 juvenile steelhead are present, this would result in 34 juvenile CCC juvenile steelhead present in the 79-foot-dewatered area during each dewatering event.[17] Considering the proposed maximum of three dewatering events that might be necessary to complete the work, this would result in 102 juvenile CCC steelhead present in the dewatered area over the term of the project.[18]

As described in Section 2.4.1.2, CCC coho salmon have an exceedingly low likelihood of occurrence in the action area at the time of project construction. Based on the limited data that exists within the San Lorenzo River watershed, NMFS estimates that no more than five juvenile CCC coho salmon will be present in each of the dewatered areas of the San Lorenzo River and Kings Creek during each construction year. Considering the proposed maximum of three dewatering events that might be necessary to complete the work, this would result in 15 juvenile CCC coho salmon present in the dewatered area over the life of the project.

Applying applicable AMMs to fish collection, relocation, and dewatering activities is expected to appreciably reduce the effects of project actions on juvenile salmonids. Specifically, salmonid collection and relocation activities conducted by NMFS-approved fisheries biologists will ensure proper equipment operation and application of NMFS guidelines thereby minimizing injury and mortality to juvenile salmonids. Restricting the work window to June 1 to October 15 will limit the effects to stream rearing juvenile salmonids. NMFS expects applying AMMs will effectively minimize injury and mortality to juvenile CCC steelhead and CCC coho in the action area.

2.5.2. Dewatering

As described above, completion of the project will require dewatering of Kings Creek and the San Lorenzo River. Cofferdams and a series of pipes will be used to temporarily divert flows around each work site during construction. Dewatering of the channel is estimated to affect up to 79 linear feet of Kings Creek and 82 linear feet of the San Lorenzo River. NMFS anticipates temporary changes to instream flow within, and downstream, of each project site during installation of the diversion systems, and during dewatering operations. Once installation of the diversion systems are complete, stream flow above and below the work sites should be the same as free-flowing pre-project conditions, except within the dewatered reaches where stream flow is bypassed. These fluctuations in flow are anticipated to be small, gradual, and short-term, but are expected to cause a temporary loss, alteration, and reduction of aquatic habitat, and, in the case of areas that will be dewatered, will likely result in mortality of any salmonids that avoid capture during fish relocation activities.

Stream flow diversion and dewatering at both project sites could harm individual rearing juvenile salmonids by concentrating or stranding them in residual wetted areas before they are relocated.

[17] ((27 juvenile steelhead/100 linear feet*0.25) + 27 juvenile steelhead) = 33.75 juvenile steelhead/100 linear feet, or 34 juvenile steelhead/100 linear feet when rounding up.
[18] 34 juvenile steelhead/100 linear feet*3 dewatering events = 102 juvenile steelhead/100 linear feet.

Juvenile salmonids that avoid capture in the project work areas will likely die during dewatering activities due to desiccation, thermal stress, or be crushed by equipment or foot traffic if not found by biologists while water levels within the reaches recede. Because the pre-dewatering fish relocation efforts at both project sites will be performed by qualified biologists, NMFS expects that the number of juvenile salmonids that will be killed as a result of stranding during dewatering activities will be very small, likely no more than one percent of the salmonids within the work sites prior to dewatering.

Dewatering operations at both project sites may affect benthic (bottom dwelling) aquatic macroinvertebrates, an important food source for salmonids. Benthic aquatic macroinvertebrates at each project site may be killed or their abundance reduced when river habitat is dewatered (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from both stream flow diversions and dewatering activities will be temporary because construction activities will be short lived, and the dewatered reaches will not exceed 79 linear feet in Kings Creek and 82 linear feet in San Lorenzo Creek. Rapid recolonization (typically one to two months) of disturbed areas by macroinvertebrates is expected following rewatering (Cushman 1985, Thomas 1985, Harvey 1986). In addition, the effect of macroinvertebrate loss on juvenile salmonids in likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream flow, if present, will be bypassed around the project work site. Based on the foregoing, juvenile salmonids are not anticipated to be exposed to a reduction in food sources at either project site from the minor and temporary reduction in aquatic macroinvertebrates as a result of dewatering activities.

Beyond the dewatered area, the temporary stream diversion at each project site is expected to resemble typical summer low conditions. The diversion systems could restrict movement of listed salmonid species in a manner similar to the normal seasonal isolation of pools by intermittent flow conditions that typically occur during summer within a portion of some streams through the range of CCC steelhead and CCC coho salmon. Because the quality of habitat in and around the action area is adequate to support rearing salmonids, NMFS expects salmonids will be able to find food and cover downstream of the action area as needed during dewatering activities.

2.5.3. Increased Sedimentation and Turbidity

The proposed project will result in disturbance of the streambed and banks for construction. Construction activities within the action area may result in disturbance of the dewatered streambed and banks for equipment access, construction activities, and placement/removal of stream diversion structures. Instream and near-stream construction activities have been shown to result in temporary increases in turbidity (reviewed in Furniss et al. 1991, Reeves et al. 1991, Spence et al. 1996). While the cofferdams and stream diversion systems are in place, construction activities are not expected to degrade water quality in Kings Creek or the San Lorenzo River because the work area will be dewatered and isolated from the flowing waters. Disturbed soils on the creek bank are easily mobilized when later fall and winter storms increase streamflow levels. Thus, NMFS anticipates disturbed soils could affect water quality and critical

habitat in the action area in the form of small, short-term increases in turbidity during re-watering (i.e., cofferdam removal), and subsequent higher flow events during the first winter storms post-construction.

Increases in sediment may affect fish by a variety of mechanisms. High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelley 1961, Bjornn et al. 1977, Berg and Northcote 1985), reduce growth rates (Crouse et al. 1981), and increase plasma cortisol levels (Servizi and Martens 1992). High turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and cause fish mortality (Sigler et al. 1984, Berg and Northcote 1985, Gregory and Northcote 1993, Velagic 1995, Waters 1995). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat, and/or increase competition and predation, decreasing chances of survival. Increased sediment deposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles (Alexander and Hansen 1986).

Chronic elevated sediment and turbidity levels may affect salmonids as described above. However, sedimentation and turbidity levels associated with cofferdam removal, rewetting of the construction sites within the action area, and subsequent rainfall events are not expected to rise to the levels described in the previous paragraph because the projects proposed soil and channel stabilization measures to prevent sediment mobilization. Additionally, Caltrans proposes AMMs and BMPs (associated with its stormwater pollution prevention plan) specifically aimed at reducing erosion, scour, and sedimentation in storage and staging areas, riparian areas, and from water diversions (Caltrans 2020). Therefore, any resulting elevated turbidity levels would be minor, occur for a short period, and be well below levels and durations shown in the scientific literature as causing injury or harm to salmonids (Sigler et al. 1984, Newcombe and Jensen 1996). NMFS expects any sediment or turbidity generated by the projects would not extend more than 100 feet downstream of the worksites, based on site conditions and methods used to control sedimentation and turbidity. Thus, NMFS does not anticipate harm, injury, or behavioral impacts to juvenile salmonids associated with exposure to the minor elevated suspended sediment levels that are expected to be generated by the projects.

2.5.4. Pollution from Hazardous Materials and Contaminants

Operating equipment in and near streams has the potential to introduce hazardous materials and contaminants into streams. Potentially hazardous materials include wet and dry concrete debris, fuels, and lubricants. Spills, discharges, and leaks of these materials can enter streams directly or via runoff. If introduced into streams, these materials could impair water quality by altering the pH, reducing oxygen concentrations as the debris decomposes, or by introducing toxic chemicals such as hydrocarbons or metals into aquatic habitat. Oil and similar substances from construction equipment can contain a wide variety of polynuclear hydrocarbons (PAHs) and metals. PAHs can alter salmonid egg hatching rates and reduce egg survival as well as harm the benthic organisms that are a salmonid food source (Eisler 2000). Disturbance of streambeds by heavy

equipment or construction activities can also cause the resuspension and mobilization of contaminated stream sediment with absorbed metals.

The equipment needed to complete the project has the potential to release debris, hydrocarbons, concrete, and similar contaminants into surface waters at both work sites. These effects have the potential to harm or injure exposed fish and temporarily degrade habitat. However, AMMs proposed at both work sites will substantially reduce or eliminate the potential for construction material and debris to enter waterways. Limiting the work window to the dry season from June 1 to October 15 will limit hazardous material exposure to juvenile salmonids, and eliminate potential for containments to adversely affect the most sensitive life stages (i.e. eggs, alevin, and fry). Equipment will be checked daily at both work sites to ensure proper operation and avoid any leaks or spills. Proper storage, treatment, and disposal of construction materials and discharge management is expected to substantially reduce or eliminate contaminants entering both waterways via runoff. Finally, the debris containment systems will eliminate containments from entering Kings Creek and the San Lorenzo River during construction activities. Due to these measures, conveyance of toxic materials into active waters at both work sites during project construction is not expected to occur, and the potential for the project to degrade water quality and adversely affect salmonids is improbable.

2.5.5. Removal of Riparian Vegetation and Habitat Loss

The project will result in permanent and prolonged temporary reductions in riparian vegetation, including tree removal, necessary for construction access and staging, and during removal of existing bridges at both work sites. Riparian vegetation helps maintain stream habitat conditions necessary for salmonid growth, survival, and reproduction. Riparian zones and wetland/aquatic vegetation serve important functions in stream ecosystems such as providing shade (Poole and Berman 2001), sediment storage and filtering (Cooper et al. 1987, Mitsch and Gosselink 2000), nutrient inputs (Murphy and Meehan 1991), water quality improvements (Mitsch and Gosselink 2000), channel and streambank stability (Platts 1991), source of woody debris that creates fish habitat diversity (Bryant 1983, Lisle 1986, Shirvell 1990), and both cover and shelter for fish (Bustard and Narver 1975, Wesche et al. 1987, Murphy and Meehan 1991). Riparian vegetation disturbance and removal can degrade these ecosystem functions and impair stream habitat. Removal of riparian vegetation increases stream exposure to solar radiation, leading to increases in stream temperatures (Poole and Berman 2001).

Complete removal of approximately four trees at the San Lorenzo River site and approximately one tree at the Kings Creek site, in addition to removal of other herbaceous vegetation, will likely result in both permanent and prolonged temporary reductions in shade and cover for fish. However, as part of Caltrans' proposed AMMs, trees will be trimmed, limbed, and root wads will be left in place in lieu of full removal, whenever possible, to prevent erosion and to reduce potential impacts of riparian vegetation removal on salmonids (Caltrans 2020). The shade lost from tree trimming, limbing, or removal will be offset by the increase in shaded areas provided by the new wider bridges (0.024 acres and 0.028 acres of new shaded area in San Lorenzo River and Kings Creek, respectively). The action area also has healthy canopy cover that will continue

to provide shade during construction of both bridges. The shade provided by the new bridges may also provide nominal benefits (i.e. cooler water temperatures) to salmonids within the action area.

Trimmed vegetation is expected to grow back, and trees and other native vegetation disturbed during construction will be replanted on-site (following the third year of construction) and monitored to ensure the success of revegetation efforts to restore areas impacted by removal of riparian vegetation. Therefore, other services provided by vegetation, such as sediment storage and filtering, nutrient inputs, sources of woody debris, and habitat complexity (i.e., cover) will remain degraded at the sites until new vegetation is replanted and becomes established. Because of the timing and establishment of the on-site revegetation, the temporary prolonged loss of cover may cause individual salmonids to seek alternative areas for cover and forage. Such temporary displacement of salmonids is not expected to reduce their individual performance because there are sites nearby that provide these features and can accommodate additional individuals without becoming overcrowded. Thus, impacts of reduced shade and other vegetative services (i.e. sediment storage and filtering, nutrient input, etc.) from removal of riparian vegetation are not expected to significantly change the behavior of individual salmonids with the action area.

2.5.6. Critical Habitat Effects

The action area is designated critical habitat for CCC steelhead and CCC coho salmon. Generally, PBFs of critical habitat for both steelhead and coho found within the action area include sites for migration, spawning, and rearing (see section 2.4.2). As discussed above, the construction activities are expected to result in disturbance to stream channels and adjacent streambanks which could result in impacts to critical habitat in the action area by diminishing PBFs.

Mobilization of sediment during construction and post-construction activities has the potential to result in high levels of turbidity and suspended sediment if appropriate AMMs are not implemented. Caltrans, however, is proposing AMMs that will isolate work sites from live streams and prevent pulses of sediment from entering streams after construction is complete. Some minor and temporary increases in turbidity and suspended sediment is expected to occur within the dewatered reaches and portion of streams downstream of the active work sites. Such increases are not expected to alter water quality, substrate conditions, or pool habitat to the extent that PBFs in the action area would be diminished.

Dewatering approximately 79 and 82 linear feet of Kings Creek and the San Lorenzo River, respectively, in the action area for up to 3.5 months during three dry seasons at each site will expose habitat in these areas to artificial and repetitive dry conditions. Salmonid forage at these sites will be reduced for up to two months following rewatering, after which, macroinvertebrate abundance is expected to return to pre-dewatering levels (Cushman 1985, Thomas 1985, Harvey 1986). Thus, forage supporting juvenile development will be diminished at each site for up to 5.5 months for up to three years. Furthermore, salmonid rearing habitat at each site will be reduced in area equal to the dewatered areas for up to 3.5 months for up to three dry seasons.

Critical habitat will also be impacted as a result of riparian vegetation removal within the action area. Impacts to freshwater rearing sites that provide shade, sediment storage and filtering, nutrient inputs, and habitat complexity will occur as a result of tree removal, trimming, and limbing, and removal of other herbaceous vegetation to complete construction at both work sites. Assuming complete removal of trees, we expect riparian vegetation attributes at both sites will return to pre-project levels within 10 years due to Caltrans' proposed AMMs, revegetation measures, and vegetation growth rates. Shade at the sites will be maintained despite reductions in vegetation because of the expansion of the bridges which is about equal to the riparian canopy reductions. However, during the construction and revegetation timeframe of 10 years, habitat at the sites will suffer reductions in vegetation associated cover and forage. These reductions will diminish the quality of salmonid freshwater rearing and adult forage sites, and migration corridors at each site during the 10 year construction and revegetation timeframe.

Finally, the proposed action may nominally improve freshwater spawning, rearing, and migration PBFs by removing 0.0005 acres of fill from the creekbed within the Kings Creek portion of the action area. Removal of this fill will provide a nominal amount of migratory and/or rearing habitat to salmonids that travel through the Kings Creek portion of the action area that has not been accessible since the construction of the Kings Creek Bridge.

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 and 402.17(a)). 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.

Residential land use and non-federal water diversions are expected to continue within the action area (NMFS 2012, NMFS 2016). Water diversion effects of reduced base flows within the action area are described in the Environmental Baseline section of this consultation. Diversions are not expected to change appreciably, and will continue to perpetuate into the future. Urban development, including rural residential and agricultural development is likely to continue throughout Santa Cruz County. NMFS assumes the rate of such development would be similar to that observed in the last decade.

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).

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 diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

The action area for the project includes two sites in Santa Cruz County, California: one located in Kings Creek, a perennial tributary to the San Lorenzo River; and one in the San Lorenzo River. Threatened CCC steelhead and endangered CCC coho salmon and their critical habitat occur in the action area. CCC steelhead are listed as threatened and CCC coho salmon are listed as endangered. Based on the extensive loss of historic habitat due to dams, forestry practices, and urban and agricultural land development, and the degraded condition of remaining spawning and rearing habitats, CCC steelhead and CCC coho salmon have experienced severe declines.

As described in the CCC Coho Recovery Plan (NMFS 2012) and the Coastal Multi-Species Recovery Plan (NMFS 2016a), and discussed in Section 2.2 above, CCC steelhead and CCC coho salmon have declined to a large degree from historic numbers. CCC coho are depressed to the point that their population is highly fragmented. Soquel Creek lost its native run of coho salmon around 1968, and the population is dependent on returns of adult coho from other watersheds (NMFS 2012). Steelhead populations in the CCC steelhead DPS are the most poorly monitored salmonid populations in the North-Central California Coast Recovery Domain (NMFS 2016a). Sub-populations within the CCC steelhead DPS, including Soquel Creek, are generally healthier than CCC coho in the same watersheds; however, population trends for both species are declining. Therefore, survival and full recovery of both populations will be unlikely unless habitat conditions are widely improved.

As described in Section 2.5 Effects of the Action, NMFS identified the following components of the project that may result in effects to CCC steelhead, CCC coho, and/or habitat: fish collection and relocation, dewatering, temporary increases in suspended sediment and other construction-related contaminants, temporary loss of benthic habitat and reductions in riparian vegetation and cover. Of these, fish collection and relocation, and dewatering have the potential to result in injury and mortality of juvenile CCC steelhead and CCC coho.

The project proposes to dewater approximately 79 and 82 linear feet of the San Lorenzo River and Kings Creek, respectively, for up to 5.5 months for up to three years; construction is scheduled to occur during the dry season. Therefore, it is anticipated that only rearing juvenile salmonids will be present in the action area during construction, and no adult or smolt life stages of salmonids would be affected by the project activities. For the San Lorenzo River Bridge Replacement and the Kings Creek Bridge Replacement projects, NMFS estimates up to 28 and 34 juvenile CCC steelhead, respectively, and five juvenile coho salmon at each site, may be present in the reaches to be dewatered prior to construction each year.

Anticipated mortality from relocation is expected to be two percent (or less) of the fish relocated, and mortality expected from dewatering is expected to be one percent (or less) of the fish in the areas prior to dewatering (combined mortality not to exceed three percent). Therefore, NMFS expects no more than one juvenile steelhead would be injured or killed by fish relocation/ dewatering at each project site during each construction year. When considering the proposed maximum of three dewatering events that might be necessary to complete the work at each site, NMFS expects no more than six juvenile steelhead would be injured or killed by fish relocation/dewatering over the life of the project. Similarly, because no more than five juvenile coho salmon are expected to be present at both project sites, NMFS expects no more than one juvenile coho salmon would be injured or killed by fish relocation/dewatering each year of construction. When considering the proposed maximum of three dewatering events that might be necessary to complete the work at each site, NMFS expects no more than six juvenile coho salmon would be injured or killed by fish relocation/dewatering over the life of the project. Due to the relatively large number of juveniles produced by each spawning pair, steelhead and coho salmon spawning in the San Lorenzo River watershed in future years are likely to produce enough juveniles to replace the few that may be lost at the project sites due to relocation and dewatering. Thus, it is unlikely that the small potential loss of up to six juvenile steelhead, and six juvenile coho salmon during the life of the project will impact future adult returns.

In addition to the adverse effects described above, we also consider the potential impacts of increased sedimentation and turbidity, pollution from hazardous materials and contaminants, and removal of riparian vegetation and habitat loss. The implementation of proposed AMMs is expected to render the potential for fish to be exposed to pollution from hazardous materials and contaminants improbable. Similarly, increased sedimentation and turbidity, and removal of riparian vegetation and habitat loss are not expected to result in reductions in fitness of individual salmonids with the action area. NMFS does not expect any of the aforementioned effects to occur simultaneously with other effects in any significant way. Therefore, we do not expect the proposed project to affect the persistence or recovery of the San Lorenzo River population of steelhead or coho, or the CCC steelhead DPS or CCC coho ESU.

The cumulative impacts of non-federal future activities that are likely to occur in, or have affects in the action area were discussed in Section 2.6, and included a discussion of the future effects of water diversions. Diversions in the San Lorenzo River watershed are expected to perpetuate the reduced base flows in the watershed, and are identified as a threat to CCC steelhead and CCC coho salmon populations in the San Lorenzo River watershed.

Climate change could affect CCC steelhead and CCC coho in the action area. Although one anticipated outcome of future climate change is increases in water temperature brought on by increased summer air temperatures, NMFS anticipates these affects will be somewhat buffered by the steep valley walls and the existing healthy tree canopy. For short-term effects, climate change is not expected to significantly worsen existing conditions over the time frame considered in this biological opinion. Considering the above, we do not expect climate change to affect CCC steelhead or CCC coho salmon in the action area beyond the scope considered in this biological opinion.

The Kings Creek and San Lorenzo sites are critical habitat for the CCC steelhead DPS and CCC coho salmon ESU. In our adverse modification analysis, we consider the condition of critical habitat, the potential effects of the projects (completed and pending) on critical habitat, and whether or not those effects are expected to directly or indirectly diminish the value of critical habitat for the conservation of CCC steelhead or CCC coho salmon. We also consider the potential for climate change to alter conditions in the action area such that critical habitat may be affected over the duration of time we consider for this consultation. These elements (condition of critical habitat across the DPS/ESU, in the watershed, and in the action area; effects of the project on critical habitat, and effects of climate change on critical habitat) are considered further below.

Across the CCC steelhead DPS and CCC coho salmon ESU, critical habitat has been degraded by habitat alteration and development. While conditions vary throughout, critical habitat is generally impaired by habitat alteration and fragmentation, water diversions, groundwater extraction, and estuarine habitat loss. These factors also affect CCC steelhead and CCC coho salmon critical habitat in the San Lorenzo River and Kings Creek, which have both been impaired by urban and agricultural development, dam construction, and forestry practices. Both watershed-wide factors and action area-specific factors affect critical habitat in the action area leading to reduced habitat complexity and accessibility, poor substrate quality for spawning, and limited juvenile rearing habitat.

Effects to critical habitat from the proposed project are expected to include temporary impacts during construction activities and reduced riparian vegetation. During dewatering activities, forage supporting juvenile development will be diminished at each site for up to 5.5 months for up to three years; and salmonid rearing habitat at each site will be reduced in area equal to the dewatered areas for up to 3.5 months for up to three dry seasons. Critical habitat at the sites will also suffer reductions in vegetation associated cover and forage during the construction and revegetation timeframe of 10 years. These reductions will diminish the quality of salmonid freshwater rearing and adult forage sites, and migration corridors at each site during the 10 year construction and revegetation timeframe. In sum, the proposed action will degrade PBFs and essential habitat types in the action area. Yet, the effects will be temporary and make up a relatively small portion of CCC steelhead and CCC coho critical habitat in the San Lorenzo River watershed and the DPS/ESU. When added to the environmental baseline, cumulative effects, and species status, the effects to critical habitat from the proposed action are not expected to appreciably reduce the quality and function of critical habitat at the larger CCC steelhead DPS or CCC coho ESU.

Regarding future climate change effects in the action area, California could be subject to higher average summer air temperatures and lower total precipitation levels. Reductions in the amount of snowfall and rainfall would reduce streamflow levels in Northern and Central Coastal Rivers. For these projects, in-water activities would occur on a relatively short-term basis, even when considering the three-year project life; thus, the above effects of climate change are not likely to be detected within that period. If the effects of climate change are detected over the short term, they will likely materialize as moderate changes to the current climate conditions within the

action area. These changes may place further stress on CCC steelhead and CCC coho salmon populations. The effects of the proposed action combined with moderate climate change effects may result in conditions similar to those produced by natural ocean-atmospheric variations described in the Environmental Baseline section of this opinion, and annual variations. CCC steelhead and CCC coho salmon are expected to persist throughout these phenomena, as they have in the past, even when concurrently exposed to the effects of similar projects.

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, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence CCC steelhead, nor destroy or adversely modify its designated critical habitat.

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, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence CCC coho salmon, nor 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

The amount of extent of take described below is based on the analysis of effects of the action done in the proceeding biological opinion. If the action is implemented in a manner inconsistent with the project description provided to NMFS, and as a result, take of listed species occurs, such take would not be exempt from section 9 of the ESA. In the biological opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

Take of listed juvenile CCC steelhead and CCC coho salmon may occur during fish relocation and dewatering of the San Lorenzo River and Kings Creek between June 1 and October 15. Construction will be completed within three construction seasons, therefore dewatering may

occur up to three times to complete the project. The number of CCC steelhead that may be incidentally taken during dewatering activities is expected to be small, and limited to the pre-smolt and young-of-the-year juvenile life stages. NMFS expects that no more than 2 percent of juvenile CCC steelhead within the dewatered area of the San Lorenzo River and Kings Creek will be injured, harmed, or killed during fish relocation activities. NMFS also expects that no more than 1 percent of the fish within the dewatered areas of the San Lorenzo River and Kings Creek will be injured, harmed, or killed during dewatering activities. When considering the proposed maximum of three dewatering events that might be necessary to complete the work at each site, no more than 84 and 102 juvenile steelhead are expected to be present at the San Lorenzo River and Kings Creek project sites, respectively. Thus, NMFS expects no more than six juvenile steelhead would be injured or killed by fish relocation/dewatering over the life of the project.

Incidental take will have been exceed at the San Lorenzo River project site if:

- more than 28 juvenile CCC steelhead are captured each year;
- more than 84 juvenile CCC steelhead are captured during the life of the project;
- more than one juvenile CCC steelhead are harmed or killed during each year; or
- more than three juvenile CCC steelhead are harmed or killed during the life of the project.

Incidental take will have been exceeded at the Kings Creek project site if:

- more than 34 juvenile CCC steelhead are captured each year;
- more than 102 juvenile CCC steelhead are captured during the life of the project;
- more than one juvenile CCC steelhead are harmed or killed during each year; or
- more than three juvenile CCC steelhead are harmed or killed during the life of the project.

Similarly, the number of CCC coho salmon that may be incidentally taken during the proposed maximum of three dewatering activities at each project site is expected to be small and limited to the pre-smolt and young-of-the-year juvenile life stages. NMFS expects that no more than 2 percent of the juvenile CCC coho salmon within the dewatered area of the San Lorenzo River Kings Creek will be injured, harmed, or killed during fish relocation activities. NMFS also expects that no more than 1 percent of the fish within the dewatered area of the San Lorenzo River and Kings Creek will be injured, harmed, or killed during dewatering activities. When considering the proposed maximum of three dewatering events that might be necessary to complete the work at each site, no more than 15 juvenile CCC coho salmon are expected to be present at both project sites during dewatering. Thus, NMFS expects no more than six juvenile CCC coho salmon will be harmed or killed by the project.

Take will have been exceeded at both project sites if:

- more than 5 juvenile CCC coho salmon are captured each year;

- more than 15 juvenile CCC coho salmon are captured during the life of the project;
- more than one juvenile CCC coho salmon are harmed or killed during each year; or
- more than three juvenile CCC coho salmon are harmed or killed during the life of the project.

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 juvenile CCC steelhead and juvenile CCC coho salmon:

- undertake measures to ensure that injury and mortality to salmonids resulting from fish relocation and dewatering activities is low;
- undertake measures to minimize harm to salmonids from construction of the project and degradation of aquatic habitat; and
- prepare and submit plans and reports regarding the effects of fish relocation, construction of the project, and post-construction site performance.

2.9.4. Terms and Conditions

The terms and conditions described below are non-discretionary, and Caltrans or any contractor must comply with them in order to implement the RPMs (50 CFR 402.14). Caltrans or any contractor 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 the contractor will allow any NMFS employee(s) or any other person designated by NMFS, to accompany, field personnel to visit the project sites during activities described in this opinion.
    b. Caltrans or the contractor will retain qualitied biologists with expertise in the area of anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. Caltrans or the contractor shall ensure that all fisheries biologists working on this project be qualified to conduct fish collections in a manner which minimizes all potential risks to ESA-listed salmonids. Electrofishing, if used,

shall be performed by a qualified biologist and conducted according to the *NOAA Fisheries Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.* See: http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d Rules/upload/electro2000.pdf.

c. The biologists will monitor the construction sites during placement and removal of cofferdams and channel diversions to ensure that any adverse effects to salmonids are minimized. The biologists will be on site during all dewatering events to capture, handle, and safely relocate salmonids to an appropriate location. The biologist will notify NMFS staff at 707-575-6068 or elena.meza@noaa.gov, one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities. During fish relocation activities the fisheries biologist shall contact NMFS staff at the above number, if mortality of federally listed salmonids exceeds three percent of the total for each species collected at each project site, at which time NMFS will stipulate measures to reduce the take of salmonids.

d. Salmonids will be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish will be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish will not be removed from this water except when released. To avoid predation, the biologists will have at least two containers and segregate young-of-year form larger age classes and other potential aquatic predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location (pre-approved by NMFS) in which suitable habitat conditions are present to allow for adequate survival of transported fish and fish already present.

e. If any steelhead or salmon are found dead or injured, the biological monitor will contact NMFS staff at 707-575-6068 or elena.meza@noaa.gov. The purpose of the contact is to review the activities resulting in take, determine if additional protective measures are required, and to ensure appropriate collection and transfer of salmonid mortalities and tissue samples. All salmonid mortalities will be retained. Tissue samples are to be acquired from each mortality per the methods identified in the NMFS Southwest Fisheries Science Center Genetic Repository protocols (contact the above NMFS office at the phone number provided) and sent to: NOAA Coastal California Genetic Repository, Southwest Fisheries Science Center, 110 McAllister Way, Santa Cruz, California 95060.

f. Non-native fish that are captured during fish relocation activities shall not be relocated to anadromous streams, or areas where they could access anadromous habitat.

2. The following terms and conditions implement reasonable and prudent measure 2:

a. Caltrans will 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. c. To ensure that the project is built as designed and contractors adhere to

construction best management practices, monitoring will be performed during construction by skilled individuals. Monitors will be knowledgeable in the project designs, construction minimization measures, and the needs of native fish, including steelhead and Chinook salmon. Monitoring will be performed daily. The monitor(s) will work in close coordination with project management personnel, the project design (engineering) team, and the construction crew to ensure that the project is built as designed.

c. d. Any pumps used to divert live stream flow will be screened and maintained throughout the construction period to comply with NMFS' Fish Screening Criteria for Anadromous Salmonids (2000).

d. e. Construction equipment used within the river channel will be checked each day prior to work within the river channel (top of bank to top of bank) and, if necessary, action will be taken to prevent fluid leaks. If leaks occur during work in the channel, Caltrans or their contractors will contain the spill and removed the affected soils.

e. f. Once construction is completed, all project-introduced material must be removed, leaving the river as it was before construction. Excess materials will be disposed of at an appropriate disposal site.

3. The following terms and conditions implement reasonable and prudent measure 3:

   a. **Project Construction and Fish Relocation Report** – Caltrans must provide a written report to NMFS by January 15 of the year following each construction season. The report must be submitted to NMFS' North-Central Coast Office, Attention: Central Coast Branch Chief, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404-6528, and via email to elena.meza@noaa.gov. The report must contain, at minimum, the following information:

      i. Construction related activities – The report(s) must include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, including 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 ESA-listed fish; the number of salmonids killed or injured during the project action; and photographs taken before, during, and after the activity from photo reference points.

      ii. Fish relocation – The report(s) must include a description of the location from which fish were removed and the release site(s) including photographs; the date and time of the relocation effort; a description of the equipment and methods used to collect, hold, and transport salmonids; if an electrofisher was used for fish collection, a copy of the logbook must be included; the number of fish relocated by species; the number of fish injured or killed by species and a brief narrative of the circumstances surrounding ESA-listed fish 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 as this time.

2.11. Reinitiation of Consultation

This concludes formal consultation for the San Lorenzo River and Kings Creek Bridge Replacement Project.

As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service 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 identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological 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. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA , EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the physical, biological, and chemical properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects 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) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH [CFR 600.905(b)].

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 PFMC and approved by the Secretary of Commerce.

3.1. Essential Fish Habitat Affected by the Project

Pacific Coast Salmon EFH may be adversely affected by the proposed action.

3.2. Adverse Effects on Essential Fish Habitat

The potential adverse effects of the project on EFH for Pacific Coast Salmon have been described in the preceding biological opinion and include degraded water quality, benthic disturbance, increased turbidity, and loss of riparian vegetation. As described in the biological opinion above, degraded water quality, benthic disturbance, increased turbidity, and loss of riparian vegetation effects are anticipated to be temporary and minor due to the amount of area impacted relative to the total quantity of habitat available in the action area. Therefore, the effects of the project on ESA-listed species are anticipated to be the same as the effects to EFH in the action area.

3.3. Essential Fish Habitat Conservation Recommendations

Based on information developed in our effects analysis (see preceding biological opinion), NMFS has determined that the proposed action would adversely affect EFH for federally managed CCC coho salmon within the Pacific Salmon FMP. Section 305(b)(4)(a) of the MSA authorizes NMFS to provide EFH conservation Recommendations that will minimize adverse effects of an activity on EFH. Although temporary potential adverse effects are anticipated as a result of the proposed project, the proposed minimization and avoidance measures, and best management practices in the accompanying biological opinion are sufficient to avoid, minimize, and/or mitigate for the anticipated affects. Therefore, no additional EFH Conservation Recommendations are necessary at this time that would otherwise offset the adverse effects to EFH.

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)). This concludes the MSA portion of this consultation.

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 is Caltrans. Individual copies of this opinion were provided to the Caltrans. The document will be available within two weeks at the NOAA Library Institutional Repository. 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

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.

5. References

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Appendix H Comment Letters and Responses (added to the Final Environmental Document)

This appendix contains the comments received during the public circulation and comment period from December 15, 2020 to January 14, 2021, retyped for readability. A Caltrans response follows each comment presented. Copies of the original comments letters and documents can be found in Volume 2 of this document.

State of California Department of Fish and Wildlife

Comment letter from Mr. Gregg Erickson, Regional Manager, submitted through email from Debbie Hultman

January 11, 2021

The California Department of Fish and Wildlife has reviewed the proposed draft Initial Study/Mitigated Negative Declaration for the San Lorenzo River Bridge and Kings Creek River Bridge Replacement Project (Project) pursuant the California Environmental Quality Act and California Environmental Quality Act Guidelines. The California Department of Fish and Wildlife is submitting comments on the draft Initial Study/Mitigated Negative Declaration for the Project as a means to inform the California Department of Transportation (Caltrans) as the Lead Agency, of our concerns regarding potentially significant impacts to sensitive resources associated with the proposed Project.

The California Department of Fish and Wildlife is a Trustee Agency with responsibility under California Environmental Quality Act Section15386 for commenting on projects that could impact fish, plant and wildlife resources. The California Department of Fish Wildlife and is also considered a Responsible Agency if a project would require discretionary approval, such as the California Endangered Species Act, the Native Plant Protection Act, the Lake and Streambed Alteration Program and other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife trust resources. Pursuant to our jurisdiction, The California Department of Fish and Wildlife has the following concerns, comments, and recommendations regarding the Project.

Project Location and Description

Caltrans, as the lead agency, proposes to replace the existing bridges along State Route 9 at the San Lorenzo River Bridge (Bridge Number 36-0052) at post mile 13.6 and the Kings Creek Bridge (Bridge Number 36-0054) at post mile 15.5 in unincorporated, Santa Cruz County, California.

The Project will remove and replace both bridges with new single-span, standard-width structures consisting of 12-foot-wide lanes and 8-foot-wide outside shoulders.

The existing metal beam guardrail would be removed and replaced with standard Midwest Guardrail. A taper would be paved on each side of the bridge to transition the new 8-foot-wide bridge shoulder to the existing roadway shoulder. Work in the streambeds will require use of a temporary diversion system to dewater work areas for demolition and removal of existing bridge abutments and piers. Existing bridge piers and their foundations would be removed from Kings Creek. It is anticipated that all work would occur within the existing state right-of-way. Existing utilities that would conflict with construction operations would be relocated. The proposed bridges would be constructed along the existing State Route 9 alignment.

LAKE AND STREAMBED ALTERATION AGREEMENT

The Project has the potential to impact resources including mainstems, tributaries and floodplains associated with the San Lorenzo River and Kings Creek known to occur within the identified limits of the Project. If work is proposed that will impact the bed, bank, channel or riparian habitat, including the trimming or removal of trees and riparian vegetation please be advised that the proposed Project may be subject to Lake and Streambed Alteration Notification. This includes impacts to drainage systems that connect to tributaries of main stem creeks and tributaries that occur within the Project Biological Study Area. The California Department of Fish and Wildlife requires and Lake and Streambed Alteration Notification, pursuant to Fish and Game Code Section 1600, and what follows, for or any activity that may substantially divert or obstruct the natural flow; change or use material from the bed, bank or channel or deposit or dispose of material where it may pass into a river, lake or stream. Work within ephemeral streams, washes, watercourses with a subsurface flow, and floodplains are generally subject to notification requirements.

CALIFORNIA ENDANGERED SPECIES ACT

Please be advised that a California Endangered Species Act Incidental Take Permit must be obtained if the Project has the potential to result in take of species of plants or animals listed under California Endangered Species Act, either during construction or over the life of the Project. Under California Endangered Species Act, take is defined as “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill.” Issuance of an Incidental Take Permit is subject to California Environmental Quality Act documentation. If the Project will impact California Endangered Species Act-listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a California Endangered Species Act Permit.

ENVIRONMENTAL SETTING

Threatened, endangered, and other special-status species that are known to occur, or have the potential to occur in or near the Project site, include, but are not limited to:

- Central California Coast Coho salmon, Evolutionarily Significant Unit (*Oncorhynchus kisutch*), State Endangered, Federal Endangered
- Foothill yellow-legged frog (*Rana boylii*, West/Central Coast clade), State Endangered
- California red-legged frog (*Rana draytonii*), State Species of Special Concern, Federal Threatened
- Townsend's big-eared bat (*Corynorhinus townsendii*), State Species of Special Concern
- Nesting birds

The California Department of Fish and Wildlife recommends that prior to Project implementation surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocol and guidelines are available at:
http://www.wildlife.ca.gov/Conservation/Survey-Protocols

COMMENTS AND RECOMMENDATIONS

The California Department of Fish and Wildlife acting as a Responsible Agency, has discretionary approval under California Endangered Species Act through issuance of a California Endangered Species Act Incidental Take Permit and Lake and Streambed Alteration Agreement, as well as other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife resources. The California Department of Fish and Wildlife would like to thank you for preparing the draft Initial Study/Mitigated Negative Declaration for the Project and the California Department of Fish and Wildlife recommends the following updates, avoidance and minimization measures be imposed as conditions of Project approval by the lead agency, Caltrans, to ensure all Project-related impacts are mitigated to below a level of significance under the California Environmental Quality Act:

COMMENT 1: Project Design Coordination

Issue: Specific engineered drawings and design specification planning sheets should be included in the updated version of the draft Initial Study/Mitigated Negative Declaration for the Project and/or provided to the natural resource agencies through continued coordination during the design and permitting process for review and comment.

Recommendation Mitigation Measure 1 – Design Consultation: The California Department of Fish and Wildlife recommends incorporation of a condition of approval in the draft Initial Study/Mitigated Negative Declaration for the Project to engage in early and continued coordination with the California Department of Fish and Wildlife Conservation Engineering Branch and National Marine Fisheries Service personnel. Early and continued coordination is important to provide the proper review and analysis of the proposed bridge placement, bridge design and

channel restoration design to ensure fish passage persists at the two Project locations and the best restoration efforts are achieved.

Comment 2: Filter Fabric Prohibition and Rock Slope Protection

Issue: The California Department of Fish and Wildlife considers hardscape, rock slope protection and filter fabric placement permanent impacts to bed, bank, channel and riparian habitat. In most circumstances The California Department of Fish and Wildlife prohibits the installation of filter fabric within the bed, bank, channel, and riparian habitat of a given creek system. The prohibition is due to the materials inhibition of root growth and development, potential to girdle large woody vegetation and issues with plastic pollution as the material breaks down over time into the natural environment.

Recommendation Mitigation Measure 1 – Filter Fabric Prohibition

The Project should not install geo-textile material or synthetic filter fabric of any kind in any portion of the Project(s). The California Department of Fish and Wildlife recommends the use of alternative non-synthetic material such as granular filter design in lieu of synthetic filter fabric. This is a layer of fine crushed, gravel that provides similar function as synthetic filter fabric. See the Federal Highway Administrations' Hydraulic Engineering Circular Number 23 - Bridge Scour and Stream Instability Volume 2 for design guidance on granular filter designs. See the Federal Highway Administrations Hydraulic Engineering Circular Number 23 Volume 1.

Recommendation Mitigation Measure 2 – Vegetated Rock Slope Protection

If Rock Slope Protection must be utilized, the California Department of Fish and Wildlife recommends that Rock Slope Protection fields are constructed with suitable non-erodible materials that will withstand typical yearly wash out. Only clean material such as, rock riprap that is free of trash, debris and deleterious material will be used as bank stabilization. Rock Slope Protection should be un-grouted rock slope protection free of cementitious material and back filled with native soil. Any energy dissipater materials should consist of clean rock, competent for the application, sized and properly installed to resist washout. Voids between rocks should be planted with riparian species native to the area including but not limited to woody vegetation. The native plantings should occur within the sections of any proposed Rock Slope Protection fields that will not be permanently shaded by the shadow of the bridge. See the National Cooperative Research Program Report - 544 Environmentally Sensitive Channel and Bank Protection Measures for design details of vegetated Rock Slope Protection.

COMMENT 3: Temporary Creek Diversion System Pipe Material

Issue: Page 15 of the draft Initial Study/Mitigated Negative Declaration for the Project notes the need for a temporary diversion system but does not specify the material of the pipe to be utilized. Due to the location of this Project in Fire Hazard

Severity Zones designated as high to very high by the California Department of Forestry and Fire Protection, there is a potential for fire to reach this site in upcoming seasons. Any plastic-material based diversion pipe in the diversion system would therefore melt or burn in the event of a catastrophic fire. The melting or burning of the plastic diversion pipe could create additional significant impacts through toxins being released into the creek system or from the inability to properly remove all the melted material from the creek.

Recommendation: The California Department of Fish and Wildlife recommends the temporary creek diversion system is designed to utilize a corrugated metal pipe-based material that is not plastic or any derivate of such a material. Any permanent drainage system designed to utilize plastic-based material pipes should also be replaced with corrugated metal pipe or concrete reinforced metal pipe to avoid melting or burning during extreme fire conditions.

COMMENT 4: Light Impact Analysis and Discussion

Issue: Currently the two proposed locations have no artificial lighting sources along the State Route 9 state highway system alignment. The California Department of Fish and Wildlife strongly recommends prohibiting the installation of any new artificial light sources within the Project limits. Artificial lighting often results in light pollution, which has the potential to significantly and adversely affect biological resources. Unlike the natural brightness created by the monthly cycle of the moon, the permanent and continuously powered lighting fixtures create an unnatural light regime that produces a constant light output. Continuous light output for 365 days a year can have a cumulatively significant impact on fish and wildlife populations.

Evidence the impact would be significant: Night lighting can disrupt the circadian rhythms of fish and wildlife species. Many wildlife species use photoperiod cues for communication (for example, bird song; Source: Miller 2006), determining when to begin foraging (Stone et al. 2009), behavior thermoregulation (Source: Beiswenger 1977), and migration (Source: Longcore and Rich 2004). Artificial night lighting has also been found to impact juvenile salmonid overwintering success by delaying the emergence of salmonids from benthic refugia and reducing their ability to feed during the winter (Source: Contor and Griffith 1995).

Recommendation: The draft Initial Study/Mitigated Negative Declaration for the Project should describe, if applicable, the type, quantity, location and specification outputs (in kelvin-scale and/or nanometers) of all proposed new and replacement artificial lighting installations. To accomplish this, the draft IS/MND should provide an analysis of the current lighting regime known to be present on site as well as an analysis of the proposed changes in the lighting regime that will occur as a result of new or replacement lighting installations through the development and comparison of Isolux diagrams. The Isolux diagrams should illustrate the area and intensity over which artificial lighting will create additional light impacts over the natural landscape or aquatic habitat along the Project corridor. The draft Initial Study/Mitigated Negative Declaration for the Project should also include a discussion in the

Biological Resources section of the potentially significant impacts that could be created by increased permanent light installations or replacements or new installations to determine the extent of the impacts to rare, threatened, endangered, nocturnal and migratory species known to occur within the Project vicinity. If new or replacement artificial lighting sources are to be installed the California Department of Fish and Wildlife recommends incorporating the following avoidance and minimization measures as conditions of approval to reduce potentially significant impacts:

Recommended Mitigation Measure 1 – Light Impact Assessment and Avoidance: The California Department of Fish and Wildlife recommends the lead agency submit to natural resource agencies, 30 days prior to the initiation of construction Isolux Diagrams that note current light levels present during Pre-Project conditions and the predicted Project light levels that will be created upon completion of the Project. Within 60 days of Project completion the lead agency should conduct a ground survey that compares predicated light levels with actual light levels achieved upon completion of the Project through comparison of Isolux diagrams. If an increase from the projected levels to the actual levels is discovered, additional avoidance, minimization or mitigation measures may be required in coordination with the natural resource agencies.

Recommended Mitigation Measure 2 – Light Output Limits: All LEDs or bulbs installed as a result of the Project should be rated to emit or produce light at or under 2,700 kelvin that results in the output of a warm white color spectrum.

Recommended Mitigation Measure 3 – Vehicle Light Barriers: Solid concrete barriers at a minimum height of 3.5 feet should be installed in areas where they have the potential to reduce illumination from overhead lights and from vehicle lights into areas outside of the roadway. Barriers should only be utilized as a light pollution minimization measure if they do not create a significant barrier to wildlife movement. Additional barrier types should be employed when feasible, such as privacy slats into the spacing of cyclone fencing to create light barriers for areas outside the roadway.

Recommended Mitigation Measure 4 – Reflective Signs and Road Striping: Retro-reflectivity of signs and road stripping should be implemented throughout the Project to increase visibility of roads to drivers and reduce the need for electrical lighting. Reflective highway markers have also been proven effective to reduce raptor collisions on highways in California's central valley if installed along highway verges and medians.

Recommended Mitigation Measure 5 – Light Pole Modifications and Shielding: All light poles or sources of illumination that are new or replacement installations should be installed with the appropriate shielding to avoid excessive light pollution into natural landscapes or aquatic habitat with the Project corridor in coordination with the natural resource agencies. In addition, the light pole arm length and mast heights should be modified to site-specific conditions to reduce excessive light spillage into

natural landscapes or aquatic habitat within the Project corridor. In areas with sensitive natural landscapes or aquatic habitat the lead agency should also analyze and determine in the updated draft Initial Study/Mitigated Negative Declaration for the Project if placing the light poles at non-standard intervals has the potential to further reduce the potential for excessive light pollution caused by decreasing the number of light output sources in sensitive areas.

CONCLUSION

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California's fish and wildlife resources. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that the California Department of Fish and Wildlife, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

Questions regarding this letter or further coordination should be directed to Mr. Robert Stanley, Senior Environmental Scientist (Specialist), at (707) 428-2093 or Robert.Stanley@wildlife.ca.gov; or Mr. Wesley Stokes, Senior Environmental Scientist (Supervisory), at (707) 339-6066 or Wesley.Stokes@wildlife.ca.gov.

cc: State Clearinghouse Number 2020120272

REFERENCES

Beiswenger, R. E. 1977. Diet patterns of aggregative behavior in tadpoles of Bufo americanus, in relation to light and temperature. Ecology 58:98–108.

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Caltrans Responses to State of California Department of Fish and Wildlife

Caltrans thanks you for your review of and comment on the draft Initial Study/Environmental Assessment for the San Lorenzo River Bridge and Kings Creek River Bridge Replacement Project and your concerns regarding potentially significant impacts to sensitive resources associated with the proposed project. Caltrans recognizes your responsibility under California Environmental Quality Act Section15386 for commenting on projects that could impact fish, plant, and wildlife resources.

As noted in Table 1.1 (Permits and Approvals Needed) in Section 1.8 (Permits and Approvals Needed) and in Section 2.3 (Biological Environment) of this document, the California Department of Fish Wildlife is considered a Responsible Agency for this project since it will require discretionary approval, such as the California Endangered Species Act, the Native Plant Protection Act, the Lake and Streambed Alteration Program and other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife trust resources. Since the project will substantially divert or obstruct the natural flow, change or use material from the bed, bank or channel Caltrans will prepare a Lake and Streambed Alteration Notification, pursuant to Fish and Game Code Section 1600. Caltrans will obtain a California Endangered Species Act Incidental Take Permit for the project for all take of species of plants or animals listed under California Endangered Species Act, either during construction or over the life of the Project.

Section 2.3.3 (Animal Species), Section 2.2.4 (Threatened and Endangered Species), and Section 3.2.4 (Biological Resources) of this document discuss impacts to threatened, endangered, and other special-status species that are known to occur, or have the potential to occur in or near the project sites. This discussion includes, but is not limited to:

- Central California Coast Coho salmon, Evolutionarily Significant Unit (*Oncorhynchus kisutch*), which listed is State Endangered and Federal Endangered
- Foothill yellow-legged frog (*Rana boylii*, West/Central Coast clade), which is listed as State Endangered
- California red-legged frog (*Rana draytonii*), State Species of Special Concern, which is listed Federal Threatened
- Townsend's big-eared bat (*Corynorhinus townsendii*), which is listed as State Species of Special Concern
- Nesting birds

Project avoidance and minimization measures in Section 2.3.3 (Animal Species) require preconstruction surveys to be conducted for special-status salamander

species and nesting birds, which have the potential to occur within the project area, prior to project implementation. Survey protocols, if available, will be followed. Section 2.3.4 (Threatened and Endangered Species) includes avoidance and minimization measures requiring biological monitoring before and during work within the streambed to reduce impacts to Central California Coast coho salmon and Central California Coast steelhead.

Caltrans thanks the California Department of Fish and Wildlife for recommending updates and avoidance and minimization measures to be imposed as conditions of project approval. Responses to these recommendations are provided below.

Response to COMMENT 1: Project Design Coordination

Specific engineered drawings and preliminary design specification planning sheets have been included in Appendix F (Project Layouts and Construction Activity Areas) of this document. Caltrans will engage in early coordination with the California Department of Fish and Wildlife to ensure that project designs will best serve both public safety and natural resources to the greatest extent possible. The early design process during the project's Plans, Specifications, and Estimates phase is the perfect opportunity to incorporate permit conditions and additional avoidance and minimization measures. Updated specific engineering and design specification planning sheets will be provided natural resource agencies through continued coordination during the design and permitting process for review and comment.

Response to COMMENT 2: Filter Fabric Prohibition and Rock Slope Protection

Concerning recommended filter fabric prohibitions, the project will not install synthetic geotextile material or synthetic filter fabric. Caltrans will use gravel filter consistent with Caltrans design guidelines for slopes with a grade of 2:1 or more gradual, wherever feasible. Measures for erosion control have been clarified in Section 2.3.2 (Wetlands and Other Waters) of this document.

Caltrans Environmental Staff will coordinate with the California Department of Fish and Wildlife regarding future strategies for vegetated rock slope protection at the project locations. Caltrans will seek to accommodate this recommendation to the greatest extent possible within the parameters of public safety and design constrictions.

Response to COMMENT 3: Temporary Creek Diversion System Pipe Material

Please note that the project is located in a Fire Hazard Severity Zone designated as Moderate by the California Department of Forestry and Fire Protection. The nearest area designated as Very High Fire Hazard Zone is over four miles away to the southwest, as noted in Section 3.2.20 (Wildfire) of this document. An evaluation of the potential impacts associated with the use of plastic-based materials for stream dewatering/diversion has been included in Section 2.3.4 (Threatened and Endangered Species) of this document. Measures to reduce impacts to Critical Habitat for special-status fish species in Section 2.3.4 (Threatened and Endangered

Species) have been updated to require the contractor to use fire-resistant materials for stream dewatering/diversion, when feasible.

Response to COMMENT 4: Light Impact Analysis and Discussion

Light sources and impacts are discussed in Section 2.1.2 (Visual/Aesthetics) and Section 3.2.1 (Aesthetics) of this document. No new artificial light sources will be installed for this project. There is no existing artificial lighting at either the San Lorenzo River Bridge or Kings Creek Bridge, and the project will not install new lighting at these locations. The light intensity and regime at the project locations will be the same before and after construction. Isolux diagrams and an extended light study will not be necessary, since the baseline conditions will remain unchanged. No LEDs or any other bulbs will be installed as a result of this project. Light limits would not exceed 2,700 Kelvin, as recommended. Therefore, no discussion of new light output is necessary, and no measures are required.

The project currently proposes to upgrade bridge railing and guardrails within the project limits to bring this project area into compliance with current safety requirements. Solid concrete barriers along the roadway are not proposed for this project since they would not meet the safety requirements for this segment of Route 9. The riparian corridors associated with the San Lorenzo River and Kings Creek are used by wildlife for passage through the project area, and these areas are situated well below the roadway. The Biological Study Areas lie in a rural residential setting that is nestled within a redwood forest, so wildlife movement in the area is already constrained by private property and fences. Light barriers would impair wildlife movement and road visibility. For these reasons, no vehicle light barriers will be included in the project plans at this time.

All road striping and signs will be up to current Caltrans design and safety standards. Signs are reflective and are designed to increase visibility of roads to drivers and reduce the need for electrical lighting. No measures for reflective signs and road striping are required since these items are typically included as standard project features for all Caltrans projects.

As previously noted, the project will not install any light poles or sources of illumination that are new or replacement. No excessive light pollution into aquatic habitat or natural landscapes will occur, therefore avoidance and minimization measures for pole modification are not necessary.

California Department of Conservation, California Geological Survey

Comment letter from David Longstreth, Senior Engineering Geologist, submitted through email

January 12, 2021

Dear Mr. Fowler,

It is understood the California Department of Transportation (Caltrans) proposes to replace the San Lorenzo River Bridge (Bridge Number 36-0052) at post mile 13.6 and Kings Creek Bridge (Bridge Number 36-0054) at post mile 15.5 on State Route 9 in Santa Cruz County, north of the unincorporated community of Boulder Creek. Each bridge would be replaced with larger structures to accommodate 12-foot-wide travel lanes and 8-foot-wide shoulders in both directions.

Work in the streambeds is proposed and would require the use of a temporary diversion system to dewater work areas for demolition and removal of existing bridge abutments and piers. Existing bridge piers and their foundations would be removed. It is understood the existing Kings Creek bridge was constructed in 1927 and foundations have been undermined via scour. It is understood the San Lorenzo bridge was constructed prior to 1937 and structural cracks are observed in the concrete abutments. No scour concerns are reported for the San Lorenzo bridge. It is understood both bridges are in close proximity to the Zayante-Vergeles Upper Fault which is an un-zoned fault. It is understood the bridge replacements are designed according to the California Department of Transportation Seismic Design Criteria.

The Santa Cruz mountains west of the proposed project area experienced a wildfire in 2020 named the CZU fire. California Geologic Survey participated in assessments of possible landsliding and flooding following the fire (Source: CalFire/CGS, 2020). The Kings Bridge replacement is not in an area that drains from the CZU burn area. The San Lorenzo Bridge replacement is in an area where U.S. Geologic Survey debris flow modeling (Source: U.S. Geologic Survey, 2020) indicates a possibility of bulked debris laden flooding (a blue stream). A “blue stream” indicates streams where peak flows associated with debris flows can be much higher than pre-fire flooding. These streams are associated with post-fire elevated flood flows and debris bulking that may exacerbate local flooding, especially in tributaries with a high combined hazard for debris flows. Our post-fire assessment indicates that flooding along the San Lorenzo River may occur if tributary drainages initiate floods or debris flows. Direct impacts from debris flows is not modeled at the San Lorenzo bridge replacement location but low to moderate debris flows are modeled in tributaries to the San Lorenzo river upstream of the replacement.

No details regarding the proposed bridge replacement foundation systems are provided in the mitigative negative declaration assessment (Source: Caltrans, 2020). Since the existing Kings Creek bridge footings are experiencing scour and the San Lorenzo bridge replacement is located in an area that may experience increased post-fire debris bulking and flooding, it appears both replacements should incorporate scour analysis and appropriate design.

Comments:

• Both replacement foundations systems should be designed for scour and consist of deepened foundations.

• It appears the foundations and bridge structures are designed to include the potential for seismic hazards. In addition to the Zayante-Vergeles Upper Fault the seismic design should consider accelerations from the San Andreas Fault, proper, if they are higher values.

• The potential for post-fire increased and bulked flood flows at the San Lorenzo bridge replacement resulting from the 2020 CZU fire should be disclosed and included in design considerations.

We hope this information is helpful. Please call us with any questions.

Caltrans Responses to California Department of Conservation, California Geological Survey

Caltrans thanks you for your review of and comments on the draft Initial Study/Environmental Assessment for the San Lorenzo River Bridge and Kings Creek River Bridge Replacement Project.

Caltrans calculates scour for foundation design based on the one percent annual exceedance probability, which is also considered the 100-year discharge. Concerning the proposed bridge foundations, one abutment foundation for the new San Lorenzo River Bridge will be a shallow footing since the rock there is competent, shallow, and not at risk from scour. The other abutment will be a deep pile foundation based on the lower rock strength and deeper depth to rock ratio, as opposed to the other side. The Kings Creek bridge site is scour critical and will be designed with that as a concern. Temporary slopes and/or shoring may be required for spread footings to reach the elevation of rock required for scour considerations at the Kings Creek Bridge site. The removal of the existing bridge abutments will improve potential scour and flow concerns. Section 1.4.1 (Build Alternative-Replace Existing Bridges) and Section 2.2.3 (Geology, Soils, Seismicity, and Topography) of this document have been updated to provide additional details regarding the proposed bridge replacement foundation systems. No additional analysis for scour is necessary for this project's evaluation of potential impacts.

In accordance with Caltrans Seismic Design Criteria Version 2.0, the design ground motion at a bridge site due to earthquakes is characterized by probabilistic analysis, and deterministic analysis is not provided anymore. Probabilistic models include the greatest significant peak ground acceleration from various sources. Although not specifically stated, the project's probabilistic model incorporated contributions from the all influencing regional faults, which would include the San Andreas Fault. No additional analysis for seismic concerns is necessary for this project's evaluation of potential impacts.

This document acknowledges the recent CZU Lightning Complex in Section 3.2.20 (Wildfires). Regarding post-fire increased and bulked flood flows, the 100-year discharge and calculated scour elevations conducted for the project were not based on bulk and burn factors. Additional soil and material from landslides caused by the

reduction of vegetation within the watershed may temporarily increase the discharge in the waterway relative to the rain and stormflow received, but this is considered a short-term concern. It is estimated that by the time construction for the new bridges is completed, the landslide concern will be reduced due to new vegetation growth. The Caltrans Structural Hydraulics and Hydrology Branch looks at the potential of occurrence, which is based on the chance of a 100-year discharge occurring while the watershed soils are still compromised and after the new structures have been completed, as being lower than a 100-year probability.

While future debris load may increase due to vegetation from the CZU Fire Complex, the quantity of debris is not generally a factor in the scour estimation aside from debris caught on piers. As noted in Section 2.3.1 (Hydrology and Floodplain), Section 2.3.4 (Threatened and Endangered Species), Section 3.2.20 (Wildfire), and Section 3.3.5 (Adaptation) of this document, the project would remove existing support structures and obstructions from the floodway. Debris estimates will be evaluated during scour calculations and will be addressed within the Final Hydraulic Reports for the Plans, Specifications, and Estimates phase of the project. Section 3.2.20 (Wildfire) has been updated to provide clarification concerning post-fire increased and bulk flood flows through the project sites. No additional analysis for wildfire, landslides, or post-fire increased and bulked flood flows is necessary for this project's evaluation of potential impacts.

Local Property Owner

Comments from a local property owner that requested to not be named were submitted through email on January 8, 2021. Per the request of the commenter, Caltrans has summarized the submitted comments in an effort to protect the identity of the commenter. Where possible the original questions and statements have been preserved and are presented below. A note indicates comments that have been summarized.

[Summary] The commenter is a longtime resident of the area and a local property owner. A legal description of their property was provided to Caltrans with their comments. Clarification regarding the location of the state right-of-way and their property was requested.

[Summary] The commenter noted concerns about noise, fumes, traffic, and erosion effects on nearby residences as a result of project demolition and construction. The commenter understands that the San Lorenzo River Bridge needs repair or replacement. The commenter expressed deep concern for the special protected environment of the valley.

How will the widening of the new San Lorenzo River Bridge be accomplished without digging into the hillsides along the highway south of the bridge?

How will lengthening the new bridge be accomplished without digging into adjacent properties?

How will the project access the river for rerouting without disturbing proprietary interest in the San Lorenzo River?

[Summary] The commenter and local community should be notified and informed regarding the impacts from the bridge replacement project so all can be prepared.

The Project Description page iii says all work will occur within existing state right of way and no new right of way would be necessary.

Chapter 2 page 24 states there will be no relocation or real property acquisitions.

Access from the highway to the stream bed is required. Where? How? Temporary road? Need landowner's permission for all access, including the River.

[Summary] The commenter acknowledged that Caltrans typically requests permission to enter private property for the purpose of conducting environmental studies.

[Summary] The commenter noted that page 59 of the draft Initial Study identifies a permanent impact such that Highway 9 will be widened into impacted areas to support a road taper from the wider bridge and guard rails. The commenter expressed confusion regarding how much widening of the roadway would occur, and where, to accommodate 8-foot shoulders.

How will this be accomplished? There is no shoulder currently. Do you plan to dig into 8 feet into private property?

Erosion control? Stability of the Hillside.

[Summary] Clarification was requested regarding the distance from the start of the new shoulder pavement taper along State Route 9 south of the San Lorenzo River Bridge to Riverdale Boulevard.

[Summary] The commenter noted that the route is used for transporting children to their schools in the valley. Concerns were raised about traffic reduction down to one lane, since vehicles will back up into Boulder Creek and block Boulder Creek Road to delay the work and school commutes of local residents.

[Summary] Concerns were raised regarding erosion from year-round ground water and storm runoff that flows down Riverdale Boulevard to Hwy 9 and north into the San Lorenzo River.

Would construction noise and pollution be tolerated better during the day rather than at night?

[Summary] Clarification regarding the duration and timing of project construction was requested.

[Summary] The commenter requested that Caltrans provide more than a newspaper ad for public outreach. The commenter suggested that Caltrans reach out to the community through Facebook valley groups, Kevin Foster (unofficial mayor of Boulder Creek), the local school district superintendent, the Boulder Creek Business Association, the Valley Press Banner newspaper, the San Lorenzo Valley Post website, and directly to all residents living along Riverdale Boulevard, Monaco Lane, and State Route 9.

Caltrans Responses to Local Property Owner

Caltrans has reviewed the property legal description that was provided by the commenter and determined that it is consistent with the 2019 Record of Survey conducted by Caltrans for the project and existing survey records regarding right-of-way. The proposed improvements will be well within the existing 80 feet of right-of-way width at the San Lorenzo River bridge, as described in the deed for Public Highway recorded in Book 98 of Official Records, starting at page 342 of that book. Project mapping for the San Lorenzo River Bridge accurately depicts the existing right-of-way lines and property boundaries. Figures showing existing rights-of-way lines and property boundaries have been included in Appendix F (Project Layouts and Construction Activity Areas) of this document.

Noise, fumes, traffic, and erosion effects resulting from project demolition and construction are discussed in Section 2.4 (Temporary Construction Impacts) of this document. The project's adverse effects to environmental resources are discussed in Chapter 2 (Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures) of this document. The final Initial Study/Environmental Assessment for the replacement of the San Lorenzo River bridge and Kings Creek bridge has determined that no significant unmitigable effects to the environmental resources will occur as a result of this project, including permanent impacts and temporary construction impacts like noise, fumes, traffic, and erosion.

More specifically regarding noise, Caltrans concurs that noise impacts are better tolerated during the day. An avoidance and minimization measure for the project noise impacts requires the Caltrans Resident Engineer to ensure that whenever possible construction work will be done during the day, especially when work is near sensitive receptors. If nighttime construction activities are necessary, the noisiest construction activities will be done nearest the residences as early in the evening as possible. Also, this project includes measures requiring the notification of surrounding residents and the public in advance of the construction schedule when construction noise and upcoming construction activities likely to produce an adverse noise environment are expected. Additionally, measures will require the Resident Engineer to consult with District 5 Noise staff to determine appropriate steps to alleviate noise-related concerns if complaints are received during the construction process.

Section 2.4.4 (Traffic and Transportation/Pedestrian and Bicycle Facilities) notes that Caltrans will coordinate traffic control measures along with signal timing and

placement to provide access priority to local properties owners and residents in the project area. Also, Caltrans will coordinate with the local transit provider to temporary relocate bus stops as needed and to provide information in advance to allow for route rescheduling. Caltrans will work with the U.S. Post Office to temporarily relocate any mailboxes blocked by project activities. Temporary construction impacts on traffic and transportation are expected to be minor as traffic access will be maintained within the project area.

Enlargement of the San Lorenzo River Bridge may require minimal excavation for asphalt pavement and guardrail installation at the base of the hillside along the highway south of the bridge. All cut and fill areas will be compacted and stabilized and will include erosion control. As noted in Section 1.4.1 (Build Alternative-Replace Existing Bridges), all work will occur within the existing state ***and County road** rights-of-way, and no new right-of-way will be necessary. No relocation or acquisition of real property will be necessary. No digging into adjacent properties will be required for this project.

Access to the streambed for stream dewatering/diversion, demolition, construction, and staging at the San Lorenzo River Bridge is proposed in regions northwest and southeast of the bridge. In accordance with legal requirements and as a courtesy to property owners, Caltrans routinely requests landowner permission prior to conducting work outside of the state-controlled right-of-way. Should access through or across private property be required, Caltrans will contact the landowner to request permission prior to the need for access. Figure 1.5, Figure 1.6 and figures included in Appendix F (Project Layouts and Construction Activity Areas) of this document show project construction activities and access areas south of the San Lorenzo River Bridge.

The new shoulder pavement along State Route 9 south of the San Lorenzo River Bridge would begin at the existing edge of pavement 120 feet south of the new bridge and would gradually widen to 8 feet at the new bridge. Minimal cut and fill work will occur within the existing state right-of-way to facilitate the placement of asphalt in the existing unpaved road shoulder.

Section 2.2.1 (Hydrology and Floodplain) states that flood control will not be affected by project demolition or construction. New and replaced stormwater drainage systems will be adequately sized to address changes in topography resulting from changes in the bridge profile and associated project features. Therefore, implementation of the proposed project is not expected to expose people or structures to a significant risk of flooding or inundation. Waterflow along State Route 9 south of the new San Lorenzo River Bridge would be improved and the potential for erosion along the roadway would be minimal.

The anticipated construction funding year noted in Section 1.1.1 (NEPA Assignment) of this document is 2022/2023. Construction activities are expected to occur in several stages over two construction seasons starting in late 2022. However, the majority of demolition and construction will not start until the spring season of 2023.

Caltrans follows the legal requirements for the public notice of environmental document availability for all projects. A public notice of availability for this project was placed in a widely circulated local newspaper. Additionally, notice of the project and the draft environmental document was posted in the Caltrans District 5 Projects Near Me website. Public notices of availability for this project were mailed to the listed addresses of all property owners and residents adjacent to the project's identified area of potential impacts. Caltrans is planning, as is routine for all construction projects, an extensive outreach campaign to notify the public of proposed construction schedules and activities in order to ensure that construction effects are minimized to the greatest extent possible. As was suggested by the commenter, Caltrans will consider all available resources to reach out to the community at the appropriate time.

List of Technical Studies

The following technical studies were used in the preparation of this document.

- Air Quality, Noise, and Green House Gas Memo (December 2, 2020)
- District Preliminary Geotechnical Report for Retaining Wall, Kings Creek (November 15, 2019)
- District Preliminary Geotechnical Report for Retaining Wall, San Lorenzo River (November 15, 2019)
- Hazardous Waste Initial Site Assessment (November 12, 2020)
- Historic Property Survey Report and Archaeological Survey Report for San Lorenzo River Bridge and Kings Creek Bridge Replacement Project (June 2019)
- Natural Environment Study for San Lorenzo River Bridge and Kings Creek Bridge Replacement (December 2020)
- Paleontological Scoping Review (November 12, 2020)
- Project Approval and Environmental Documentation Hydraulic Recommendations (November 12, 2019)
- Preliminary Hydraulic Report for the Advance Planning Study (June 2,2016)
- Structure Preliminary Geotechnical Report for Kings Creek Bridge (June 30, 2016)
- Structure Preliminary Geotechnical Report for San Lorenzo Bridge (June 29, 2016)
- Visual Impact Assessment of the Proposed San Lorenzo River Bridge and Kings Creek Bridge Replacement (May 1, 2020)
- Water Quality Document for Bridge Replacement (April 17, 2018)

To obtain a copy of one or more of these technical studies/reports or the Initial Study/Environmental Assessment, please send your request to the following email address: Info-d5@dot.ca.gov

Please indicate the project name and project identifying code (under the project name on the cover of this document) and specify the technical report or document you would like a copy of. Provide your name and email address or U.S. postal service mailing address (street address, city, state and zip code).