**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

February 28, 2022 **Refer to NMFS No:** WCRO-2021-02652

Cristin Hallissy, Office Chief
Office of Biological Sciences and Permits
California Department of Transportation, District 4
P.O. Box 23660, M/S 8E
Oakland, California 94623-0660

Re: Endangered Species Act Section 7(a)(2) Biological for the Alpine Road Undercrossing Bridge Seismic Restoration Project

Dear Ms. Hallissy:

Thank you for your letter of September 8, 2021, 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 Alpine Road Undercrossing Bridge Seismic Restoration Project (Project)(EA 04-4J850).

The enclosed biological opinion is based on our review of California Department of Transportation's (CalTrans)[1] proposed Project and describes NMFS' analysis of potential effects on threatened Central California Coast (CCC) steelhead and the designated critical habitat for the species. NMFS concludes that the Project is not likely to jeopardize the continued existence of the species; nor is it likely to destroy or adversely modify critical habitat. However, NMFS anticipates that take of the species would occur in the form of harm, injury, or mortality during dewatering and fish relocation activities. An incidental take statement with terms and conditions is included with the enclosed biological opinion.

Please contact Andrew Trent, North Central Coast Office in Santa Rosa, California at (707) 578-8553, or email at andrew.trent@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Samuel Aguilar, Caltrans, Oakland, CA, samuel.aguilar@dot.ca.gov
Copy to ARN E-File #151422WCR2021SR00210

[1] Caltrans is acting as the lead agency under direction of the June 2007 Memorandum of Understanding (MOU) (23 U.S. C. 326) between Caltrans and the Federal Highway Administration. As assigned by the MOU, Caltrans is responsible for the environmental review, consultation and coordination on this project.

**Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion**

Alpine Road Undercrossing Bridge Seismic Restoration Project

NMFS Consultation Number: WCRO-2021-02652
Action Agency: California Department of Transportation

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 steelhead (*Oncorhynchus mykiss)* | Threatened | Yes | No | Yes | No |

**Consultation Conducted By:** National Marine Fisheries Service, West Coast Region

**Issued By**:

Alecia Van Atta
Assistant Regional Administrator
West Coast Region

**Date**: February 28, 2022

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# 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.), as amended, and implementing regulations at 50 CFR part 402.

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 [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at NMFS North-Central Coast Office in Santa Rosa, California (ARN #151422WCR2021SR00210).

## 1.2. Consultation History

- August 15, 2018: Samuel Aguilar (California Department of Transportation (Caltrans)) retrieved an informational resource list from the Information for Planning and Consultation database.
- October 12, 2018: Gregory Pera (Caltrans) emailed Darren Howe and John Wooster from NMFS to invite them to a field visit.
- December 7, 2018: A field visit was conducted between Samuel Aguilar, Gregory Pera, Marissa Brown (Caltrans), Darren Howe, Elena Meza, and John Wooster (NMFS).
- December 19, 2018: Samuel Aguilar contacted Darren Howe and John Wooster to confirm survey data needed. Subsequent discussion occurred through March 2021.
- April 19, 2019: An official species list was requested from NMFS.
- September 12, 2019: Samuel Aguilar contacted Elena Meza and John Wooster to inform them of survey completion and pending data submittal for creek modeling.
- September 19, 2020: Samuel Aguilar contacted Elena Meza and John Wooster to inform them of pending creek model and to solicit input on materials required and design coordination.
- November 6, 2019: Samuel Aguilar contacted Elena Meza and John Wooster to inform them of model completion and to propose a meeting to discuss the model results and creek design. Subsequent discussion and information requests occurred via email.
- January 9, 2020: Samuel Aguilar contacted Elena Meza and John Wooster to provide information requested in the November 2019 conversation. Feedback was received January 22, 2020.
- March 2020: Phone call between Caltrans staff Samuel Aguilar, Gregory Pera, and Cristin Hallissy, and NMFS staff Elena Meza, John Wooster, and Amanda (Mandy) Ingham. Discussed the potential to permit this Project under Caltrans' existing NMFS Programmatic Biological Opinion.

- June 23, 2020: John Wooster contacted Samuel Aguilar to request an update to the Project status. Samuel Aguilar responded and requested design input.
- October 1, 2020: A site visit occurred involving Samuel Aguilar, Gregory Pera, Robert Stanley (CDFW), and Rick Macala (CDFW). Robert Stanley and Rick Macala were involved all subsequent conversations with NMFS.
- November 17, 2020: Samuel Aguilar contacted Elena Meza and John Wooster to provide a draft of the proposed creek design.
- February 2, 2021: Caltrans received feedback from John Wooster on the draft creek design.
- March 19, 2021: Samuel Aguilar submitted an updated creek design to Elena Meza and John Wooster.
- June 9, 2021: Caltrans received feedback from John Wooster on the March 2021 creek design.
- July 7, 2021: A meeting was held to discuss the potential for ESA compliance though the National Oceanic and Atmospheric Administration (NOAA) Restoration Center Programmatic Biological Opinion. Samuel Aguilar, Elena Meza, Joe Pecharich (NMFS), Justin Whitfield (AECOM), and DJ Allison (AECOM) attended.
- July 10, 2021: Samuel Aguilar contacted Elena Meza and John Wooster to inform them that Caltrans will not permit this Project under the Restoration Center Programmatic Biological Opinion and will seek an individual Biological Opinion.
- July 15, 2021: Samuel Aguilar contacted Elena Meza and John Wooster to discuss modifying the March 2021 creek design to reduce the number of trees requiring removal. Subsequent discussion continues to present.
- July 26 through October 8, 2021: Extensive email correspondence between Caltrans and their contractors, John Wooster, and Rick Macala regarding the draft plan's flood bench construction. The draft plan March 2021 plan design resulted in the loss of several oak trees along the top of left bank. After further discussion the July 2021 design was put forth, which saved most of those trees but left two needing to be removed. Further discussion led to the September 2021 plans, which did save the two additional trees, but required a substantial narrowing of the flood bench to do so. After more discussion it was decided that it was more important to preserve the flood bench width than to save those two trees and decided to proceed with the July 2021 plans as the design.
- September 8, 2021: Caltrans requested initiation of formal consultation with NMFS, North-Central Coast Office for the Alpine Road Undercrossing Bridge Seismic Restoration Project. Caltrans determined that the Project may affect and is likely to adversely affect CCC steelhead, but is not likely to adversely affect CCC steelhead critical habitat. Included with the Caltrans' request for consultation was a Biological Assessment prepared by Caltrans.
- October 8, 2021: NMFS possesses sufficient information to initiate consultation for the Project.

### 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 (see 50 CFR 402.02).

Caltrans is proposing to seismically retrofit two bridges on Interstate 280 at the Alpine Road crossing, near Portola Valley, CA (EA 04-4J850), and to improve fish passage in Los Trancos

Creek immediately below the two bridges. The purpose of the Project is to improve seismic safety by preventing potential bridge collapse during a seismic event. The Proposed Action would install steel column casings and other structural measures at each of the 12 bridge columns (six on each bridge), and to replace the existing gabion mattress and weir structures in Los Trancos Creek with 309 linear feet of rock ramps and a riffle-pool channel complex, to improve fish passage and restore and rehabilitate creek habitats including riparian habitat.

### 1.3.1. Bridge Seismic Upgrade

In order to install steel column casings at each bridge, the base of each column would be excavated up to 3.5 feet in depth and approximately 4 feet in width, exposing the top of each column's footing. Two halves of the steel casings would then be placed around the columns and welded in place. Cement compaction grout would be poured to fill any space between the casing and the existing column. The casings would be installed in sections along the height of the columns. Following grouting, concrete caps would be poured on top of the compaction grout, with a maximum width of 8 feet. Concrete caps and grouting would then be covered with native fill to maintain the creek topography. Three bents are in uplands; however, Bent 2 (the easternmost bent) is near the top of the bank associated with Los Trancos Creek.

### 1.3.2. Fish Passage Improvement

Due to the proximity of Los Trancos Creek to the bridge columns, a portion of the creek bank and the gabion mattress would need to be removed to allow for construction at Bent 2. A site assessment revealed the presence of five v-notched concrete weirs that are partial fish passage barriers in Los Trancos Creek beneath the overpass. These weirs are slated for removal. The main objectives of this component of the Project are the restoration of the instream and riparian habitats, and mitigation of potential impacts to these resources. The restoration design would improve passage for adult and juvenile CCC steelhead (O. mykiss). The restoration design incorporates the following activities to accomplish the design objectives:

- replacement of the existing gabion and weir structures with a rock ramp and pools;
- grading to provide a smooth longitudinal slope, with a resting unit near the midpoint of the rock ramp;
- a restored creek bed with a roughened channel/rock ramp and pools with a V-shaped notch placed along the channel centerline to maintain an adequate depth for fish during periods of low flows; and
- a flood bench along the left bank of the rock ramp portion of Los Trancos creek that will be graded based on the 1.5 year flood elevation to create an area for higher flows to spread out and dissipate energy.

Stream restoration would entail the creation of two pools and the installation of a rock ramp, consisting of alternating rock bands and structural rock along Los Trancos Creek, in place of existing partial fish passage barriers. The rock ramp and associated pools would slow the velocity along the creek to provide resting habitat for anadromous fish. The new stream grade would also increase the depth of the channel, creating more favorable conditions for salmonids during the dry season. Prior to the onset of restoration, the five existing concrete weirs and two jump boxes would be removed via excavation.

Following the excavation of existing concrete structures, the channel would be graded for Project construction, and native fill would be stockpiled for later use. Flow pools would be installed at the northern and southern extent of the Project area. Along the upstream and downstream end of each pool, buried rock weirs would be installed to improve channel stability without impacting fish passage. Buried rock weirs would be composed of structural rock and engineered stream bed material.

Moving downstream, the rock ramp would be installed in two band formations, with varying rock sizes and embedment, in an alternating pattern. Each rock band is approximately 15 feet in length, with bank-to-bank width varying according to its location in the channel. Bank width would depend on existing site conditions and creek top of bank (TOB). The pattern would repeat for approximately 210 feet at a slope of approximately 3.2 percent, until the first buried rock weir structure at the second pool is reached.

A total of four buried rock weirs would be installed along Los Trancos Creek, bookending each of the pools. Three structural rock sizes would be used along the rock ramp and for the buried weirs. Rocks would have a median diameter of 3 feet in Group A, 2.5 feet in Group B, and 1.5 feet in Group C. The first three buried rock weirs, when moving downstream, would use only Groups B and C for construction. However, the buried rock weir farthest downstream would use all three rock types, giving it a wider base for added ballast and increased stability.

The Project also incorporates a 9-foot-wide flood bench along the left bank of Los Trancos Creek, nearest to Alpine Road. The flood bench would be at the 1.5-year flood level (at or near the OHWM) and contour up to the original TOB. The right bank of the creek would be re-contoured slightly from existing conditions and would remain native fill; the left bank would be composed of rock slope protection (RSP) laid over permeable Class II gravel material adjacent to the flood bench. The resulting composition of the left bank would consist of a structural rock flood bench, two layers of fill over the creek bank, and RSP on top of gravel. RSP will be placed along approximately 200 linear feet of the west bank and 187 linear feet along the east bank within the 309 linear feet of creek to be rebuilt.

The final design came to be through a series of design iterations and input from CDFW and NMFS. The roughened channel concept, which includes a rock ramp with rock bands placed in a grid like pattern throughout the stream channel and pools surrounded by buried weirs, were based on guidance from the Caltrans report, Fish Passage Design for Road Crossings (FPD) (Caltrans, 2014) and the California Salmonid Stream Habitat Restoration Manual Part XII Fish Passage Design and Implementation (CSSHRM Part XII) (CDFW, 2009). The flood bench was designed with guidance from the Iowa Department of Natural Resources Floodplain Restoration Techniques, (Iowa DNR, 2018).

### 1.3.3. Access and Staging

A temporary access road would be constructed off Alpine Road eastbound for construction access to Bent 2 and Los Trancos Creek. The access road would be between 15 and 20 feet wide and would be graded with a bulldozer. Tree trimming or removal, and vegetation grubbing, would be conducted as necessary to gain access to Los Trancos Creek. Up to 6 inches of a base rock material

layer would be placed on the temporary access road to help stabilize and control equipment tracking. The primary material and equipment staging area would be in the northwestern quadrant of the interchange, adjacent to the I-280 northbound onramp. This staging area can be accessed from westbound Alpine Road or the northbound I-280 onramp.

### 1.3.4. Dewatering and Fish Relocation

A temporary creek diversion and dewatering system would be installed to divert Los Trancos Creek flow and create a dry work area during construction. The distance between the upstream and downstream cofferdams will be approximately 352 linear feet of Los Trancos Creek. The temporary creek diversion system would consist of a diversion pipe and cofferdams. Cofferdams would be created from gravel bags and impermeable plastic membrane with a minimum height of 2 feet and a 2:1 slope ratio. A pipe would be installed inside the cofferdam to divert water around or through the Project site. The pipe may be moved during construction to facilitate construction of the fish habitat improvements.

Water present between the cofferdams (construction water) would be pumped out of the creek and discharged to upland areas. If necessary, construction water would be routed to a settling tank or an active treatment system to protect downstream water quality. Water entering the diversion system upstream of the coffer dam would be routed through or around the work area and discharged downstream of the lower coffer dam without being treated. Instream water quality would be monitored downstream of the Project footprint and the diversion pipe for turbidity, pH, temperature, and dissolved oxygen to minimize potential effects of the dewatering and water diversion activities on water quality and aquatic resources.

Upon completion of cofferdam installation, a NMFS-approved biologist will initiate a program to capture and relocate native vertebrates to a suitable location upstream. Fish will be collected using seining, dip netting or electrofishing. The biologist will minimize handling of salmonids, and when handling is necessary, the biologist will always wet hands or nets prior to touching fish. Captured fish will be held in a container with a lid that contains cool, shaded water that will be continuously aerated with a battery-powered external bubbler. Fish will not be subjected to jostling or excess noise and will not be overcrowded in the containers. Two holding containers will be available to segregate young-of-the-year fish from larger fish to avoid predation. Fish will not be removed from the container until the time of release. Captured fish will be relocated to the nearest point immediately downstream of the dewatered area in a site with suitable habitat conditions. For all captured individuals the biologist will identify species, estimate year-classes, and record estimated numbers at the time of release. The fish will not be anesthetized or measured. A report summarizing the fish relocation activities will be submitted to following the relocation effort.

### 1.3.5. Site Cleanup and Restoration

All construction-related materials would be removed after construction activities are completed. All temporarily disturbed areas, including the riparian area, would be regraded and restored to preconstruction conditions or to match surrounding topography to the extent practicable. Temporarily disturbed areas would be revegetated and restored to pre-work conditions after the completion of all construction activities. Permanent erosion control, including soil stabilization measures such as hydroseeding, coir netting, and non-filament mesh fiber rolls, would be applied to affected areas to minimize erosion after construction has been completed.

The biological and hydrological conditions in Los Trancos Creek would be improved because the fish passage barrier would be removed; the creek bed and bank would be stabilized and restored without using grade control structures; and the adjacent riparian habitat would be restored to pre-project conditions. These actions would have a net benefit to CCC steelhead in Los Trancos Creek. Because the Project site is beneath the overpass, the temporal loss of overhanging vegetation is unlikely to result in any changes to water temperature.

### 1.3.6. Work Sequence and Duration

Project activities at Bent 2 would be limited to the dry season work window of June 15 through October 15. Because Bent 3 and Bent 4 are outside the creek, activities at those bents would take place outside of the dry season work window. Construction activities at Bent 2 would be restricted during inclement weather to avoid potential impacts to CCC steelhead DPS. Construction activities are expected to be completed in 116 working days. The fish habitat and passage components of the proposed construction are expected to be completed in 44 working days.

Nighttime work would be avoided to the maximum extent practicable; work generally would occur from 6 a.m. to 9 p.m. If nighttime work is required, all lighting would be directed downward and toward the active construction area. Directional shields would be attached to the portable tower lights, and personnel would only direct lights downward and toward active construction and staging areas. Lighting per portable tower light would not exceed 2,000 lumens.

Caltrans anticipates that construction would occur along the following sequence of events:

1. All environmentally sensitive areas to be avoided during construction activities would be fenced and/or flagged as close to the construction limits as feasible.
2. A temporary construction entrance and construction access road would be installed allowing equipment to enter the Project site from Alpine Road.
3. K-rails and appropriate safety measures for crew would be installed along eastbound Alpine Road.
4. Erosion perimeter controls would be installed as designated on the design construction plans.
5. The contractor would clear areas and trim vegetation as necessary in the workspace. Clearing would be kept to a minimum.
6. Dewatering activities along Los Trancos Creek would begin with the installation of a cofferdam at the upstream and downstream extents of the Project. The cofferdam would be composed of gravel-filled bags and an impermeable plastic membrane.
7. Dewatering would be performed in the cofferdam, pumping water to a water/sediment filter bag stabilized in the uplands. Pump intakes would be provisioned with NMFS-approved fish screening, as outlined in NMFS' Fish Screening Criteria for Anadromous Salmonids (NMFS 1997). Any fish in the dewatered area would be captured and relocated during the dewatering.
8. Construction equipment would cross Los Trancos Creek.
9. Bent 2 would be seismically retrofitted along the southern border of Los Trancos Creek below the I-280 overpass. Excavation would take place around the base of the concrete

columns, removing the gabion material. Steel column casings would be installed around each column and welded shut.

10. The interstitial space between the steel casing and concrete column would be filled with cement compaction grout. A concrete cap, with a maximum width of 8 feet, would be poured over the casings and column.
11. The excavated area would be backfilled with native material and restored to the original grade.
12. Existing partial fish passage barriers, five concrete weirs, and two jump boxes would be removed from Los Trancos Creek.
13. Regrading and excavation of new pools would take place along Los Trancos Creek.
14. Native creek material would be stockpiled.
15. The rock ramp structural rock repeating pattern would be installed.
16. The cofferdam gravel-filled bags and impermeable plastic membrane would be removed from upstream and downstream of the Project area.
17. Immediately after earth disturbance activities cease, Caltrans standards for temporary and permanent stabilization timeframes would be followed. The area would be revegetated with appropriate native plants.
18. All temporary erosion-control measures would be removed only after their tributary areas have been permanently stabilized.
19. Permanent erosion and sedimentation best management practices (BMPs) remain in place.
20. An area would be considered to have achieved final stabilization when it has a minimum uniform 70 percent vegetative cover or other permanent non-vegetative cover, with a density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding and other movements.

### 1.3.7. Conservation Measures

- In-channel work will be restricted to occur between June 15 and October 15.
- During construction, the resident engineer, contractor, and Caltrans biologist will field mark and approve all trees to be removed prior to removal.
- Attempts to minimize tree removal will include trimming wherever possible.
- Creek material such as gabion mattress and concrete weirs will be removed over a total distance of approximately 309 feet for construction and will be restored to a more natural creek channel once stabilization is completed.
- Equipment will not operate in sensitive areas or habitats, unless necessary to complete construction work. The extent of stream channel dewatering will be limited to the minimum necessary to support construction activities. Monitoring of the stream diversion will occur periodically each day to check that equipment is functioning properly.
- Flow will be diverted the minimum distance necessary to isolate the construction area.
- Water will be released or pumped downstream at an appropriate rate to maintain downstream flows at all times, and the outlet of all diversions shall be positioned so that the discharge of water does not result in bank erosion or channel scour, and maintains pre-project hydraulic conditions.
- Water pumped from areas isolated from surface water to allow construction to occur in dry conditions will be discharged to an upland area providing overland flow and infiltration before returning to stream. Upland areas may include sediment basins of sufficient size to allow infiltration rather than overflow or adjacent dry gravel/sand bars if the water is clean

and no visible plume of sediment is created downstream of the discharge. Other measures may be used such as a baker tank.

- A NMFS-approved fish biologist will be on site to observe dewatering activities and to capture/rescue/relocate any fish that are observed in an isolated area during dewatering activities.
- Environmentally sensitive areas will be fenced to prevent encroachment of equipment and personnel into wetlands, riparian areas, stream channels and banks, and other sensitive habitats.
- Staging and parking will be in designated areas a minimum of 150 feet from the ordinary high-water line (OHWL), as specified by the Project biologist in coordination with the Project Engineer.
- Disturbance and removal of aquatic vegetation will be minimized.
- Gravel and large woody debris excavated from the channel and temporarily stockpiled for reuse in the channel will be stored in a manner that prevents mixing with stream flows.
- When concrete is poured to construct bridge footings or other infrastructure in the vicinity of flowing water, work must be conducted to prevent contact of wet concrete with water (e.g., in a cofferdam). Concrete or concrete slurry will not come into direct contact with flowing water.
- Equipment will be inspected daily for leaks and completely cleaned of any external petroleum products, hydraulic fluid, coolants, and other deleterious materials prior to operating equipment.
- Maintenance and fueling of construction equipment and vehicles will occur at least 50 feet from the OHWL or the edge of sensitive habitats (e.g., wetlands).
- A Spill Prevention, Control, and Countermeasures (SPCC) Plan will be developed for each project that requires the operation of construction equipment and vehicles. The SPCC Plan will be kept on site during construction, along with the appropriate materials and equipment to ensure that the SPCC Plan can be implemented. Personnel will be knowledgeable in the use and deployment of the materials and equipment to ensure that response to an accidental spill will be timely.
- A worker environmental awareness training will be conducted by a qualified biologist before work begins to provide information on all listed species (including state-listed and state fully protected species) potentially in the action area, the protection afforded the species by ESA and the California ESA, and guidance on those specific protection measures that must be implemented as part of the Project activities.

### 1.3.8. Minimization of Erosion, Sedimentation, and Tubidity

Effective erosion-control measures will be in place at all times during construction. Construction will not begin until all temporary erosion-control devices (e.g., straw bales with sterile weed-free straw and silt fences) are in place downslope or downstream of the Project site in the riparian area. The devices will be properly installed at all locations where the likelihood of sediment input exists. These devices will be in place and properly maintained during and after construction activities for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and of detaining sediment-laden water on site. If continued erosion is likely to occur after construction is completed, then appropriate erosion prevention measures will be implemented and maintained

until erosion has subsided. Erosion control devices such as coir rolls or erosion-control blankets will not contain plastic netting of a mesh size that would entrain fish, reptiles, or amphibians.

Sediment will be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 12 centimeters, and only sterile, weed-free straw will be used. Sediment-laden water created by construction activity will be filtered before it leaves the right-of-way or enters the stream. The contractor will inspect, maintain, and repair all erosion-control materials prior to and after any significant storm event, at 24-hour intervals during extended storm events, and a minimum of every 2 weeks until all erosion-control measures have been completed.

#### 1.3.9. Minimization of impacts to Riparian Vegetation

As many trees and as much brush as possible will be retained, emphasizing shade producing and bank-stabilizing trees and brush. All disturbed areas will be revegetated with native grasses, trees, or shrubs appropriate for the site. Prior to construction, equipment access points will be determined that minimize riparian disturbance. Preexisting access points will be used whenever possible. Unstable areas will be avoided. Soil compaction will be minimized by using equipment with a greater reach or that exerts less pressure per square inch on the ground, resulting in less overall area disturbed or less compaction of disturbed areas. If riparian vegetation is to be removed with chainsaws, every attempt will be made to use saws that operate with vegetable-based bar oil.

#### 1.3.10. Hazardous Material Spill Prevention and Planning

Debris, soil, silt, excessive bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life, resulting from Project-related activities, will be prevented from contaminating the soil and from entering the stream. Any of these materials placed within or where they may enter a stream will be removed immediately. During Project activities, all trash that may attract potential predators will be properly contained, removed from the work site, and disposed of daily. Where feasible, construction will occur from the bank or on a temporary pad underlain with filter fabric. No heavy equipment will enter wetted channels.

All construction equipment will be in good working condition, showing no signs of fuel or oil leaks. Prior to construction, all mechanical equipment will be thoroughly inspected and evaluated for the potential of fluid leakage. All questionable motor oil; coolant; transmission fluid; and hydraulic fluid hoses, fittings, and seals will be replaced. The contractor will document in writing all hoses, fittings, and seals replaced and will keep this documentation until the completion of operations. All mechanical equipment will be inspected on a daily basis to ensure that there are no motor oil, transmission fluid, hydraulic fluid, or coolant leaks. All leaks will be repaired in the equipment staging area or other suitable location prior to resumption of construction activity.

Oil-absorbent and spill containment materials will be kept on site when mechanical equipment is in operation within 100 feet of Los Trancos Creek. If a spill occurs, no additional work will occur in-channel until (1) the mechanical equipment is inspected by the contractor and the leak has been repaired, (2) the spill has been contained, and (3) NMFS and CDFW are contacted and have evaluated the impacts of the spill.

### 1.3.11. Biological Monitoring

A qualified biologist (i.e., the biological monitor) will be on site during all clearing, grubbing, ground disturbance, and in-channel activities to prevent adverse and unforeseen effects to steelhead. The biological monitor will survey the work area for special-status species and signs of their presence before the start of groundbreaking activities each day, and will monitor work activities and instream habitat on site during all ground-disturbing activities. If a special-status species is observed, the biological monitor will have the authority to stop activities if necessary. The contractor will install flagging or fencing around the work area and staging areas along the footprint boundary, under the supervision of the biological monitor, to clearly mark the work area limits. To reduce the potential for attracting sensitive wildlife species and their predators to the area, all trash will be properly contained and removed from the area regularly. All construction debris and trash will be removed from the site when work activities are complete.

Any suspected take of listed species will be reported immediately to the United States Fish and Wildlife Service, NMFS, or CDFW. A monitoring report will be provided to NMFS within 120 calendar days following the completion of construction. The report will include the number and estimated life history stage of steelhead captured and removed; any effect of the Project activities on steelhead; and photos taken before, during, and after construction from photo reference points.

### 1.3.12. Post Construction Erosion Control

Immediately after Project completion and before the close of the seasonal work window, all exposed soil will be stabilized with mulch, seeding, and/or placement of erosion control blankets. All artificial erosion-control devices will be removed after the Project area has fully stabilized. All exposed soil present in and around the Project site will be stabilized within 7 days. All bare and/or disturbed slopes (larger than 10 feet by 10 feet of bare mineral soil) will be treated with erosion-control measures, such as hay bales, netting, fiber rolls, native mulch/slash, and hydroseeded, as permanent erosion-control measures. Where straw, mulch, or slash is used as erosion control on bare mineral soil, the minimum coverage will be 95 percent, with a minimum depth of 2 inches. When seeding is used as an erosion-control measure, only native seed will be used. Sterile, weed-free straw (free of nonnative weeds) is required when hay bales are used as an erosion-control measure.

### 1.3.13. Post Construction Riparian Restoration

Temporarily disturbed areas will be restored to the preconstruction or improved contours and functions, to the maximum extent practicable. Where soil compaction is unintended, compacted soils will be loosened after heavy construction activities are complete. Exposed slopes and bare ground will be reseeded with native grasses and shrubs to the maximum extent feasible, to stabilize and prevent erosion. Native riparian trees with a diameter at breast height greater than 4 inches will be replaced in kind. Where disturbance includes the removal of trees, native species will be replanted at a 3:1 ratio for every native tree removed and 1:1 (native) for every nonnative tree removed, based on the local species composition.

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 to 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 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 also relies on the regulatory 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 designation(s) of critical habitat for CCC steelhead uses the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the 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 ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision 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 critical 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.

#### 2.1.1. Use of Best Available Scientific and Commercial Information

To conduct the assessment presented in this opinion, NMFS examined an extensive amount of information from a variety of sources. Detailed background information on the biology and status of the listed species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. Additional information regarding the potential effects of the proposed Project-related activities on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was formulated from the aforementioned resources, and the following biological assessment.

- Biological Assessment: Alpine Road Undercrossing Bridge Seismic Restoration Project. Los Trancos Creek, San Mateo and Santa Clara County, CA. EA 04-4J850. August, 2021.

For information that has been taken directly from published, citable documents, those citations have been reference in the text and listed at the end of this document. A complete record of this consultation is on file at NMFS North-Central Coast Office in Santa Rosa, California (ARN #151422WCR2021SR00210).

### 2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that is likely to 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" for the jeopardy analysis. 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. Listed Species

This biological opinion analyzes the effect of the proposed Alpine Road Undercrossing Bridge Seismic Restoration Project, San Mateo and Santa Clara County California, California on CCC steelhead in Los Trancos Creek. CCC steelhead are listed as threatened under the ESA (71 FR

834, January 5, 2006). The CCC steelhead distinct population segment (DPS) includes steelhead in coastal California streams from the Russian River to Aptos Creek, and the drainages of Suisun Bay, San Pablo Bay, and San Francisco Bay. CCC steelhead occur in Los Trancos Creek and are expected to be present in the action area during construction. The action area includes critical habitat for CCC steelhead (70 FR 52488; September 2, 2005).

### 2.2.2. Steelhead General Life History

Steelhead are anadromous fish, spending some time in both fresh- and saltwater. The older juvenile and adult life stages occur in the ocean, until the adults ascend freshwater streams to spawn. Eggs (laid in gravel nests called redds), alevins (gravel dwelling hatchlings), fry (juveniles newly emerged from stream gravels), and young juveniles all rear in freshwater until they become large enough to migrate to the ocean to finish rearing and maturing to adults. General reviews for steelhead in California document much variation in life history (Shapovalov and Taft 1954, Barnhart 1986, Busby *et al.* 1996, McEwan 2001). Although variation occurs in coastal California, steelhead usually live in freshwater for 1 to 2 years in central California, then spend 2 or 3 years in the ocean before returning to their natal stream to spawn. Steelhead may spawn 1 to 4 times over their life. Adult steelhead returning from the ocean to the San Francisquito Creek watershed which includes Los Trancos Creek typically immigrate to freshwater between December and April, peaking in January and February, and juveniles migrate as smolts from the watershed to the ocean from January through June, with peak emigration occurring in April and May (Fukushima and Lesh 1998).

Steelhead fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Shirvell 1990, Meehan and Bjornn 1991). Steelhead, however, tend to use riffles and other habitats not strongly associated with cover during summer rearing more than other salmonids. Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. Rearing steelhead juveniles prefer water temperatures of 7.2-14.4 degrees Celsius (°C) and have an upper lethal limit of 23.9°C (Barnhart 1986, Bjornn and Reiser 1991). They can survive in water up to 27°C with saturated dissolved oxygen conditions and a plentiful food supply. Fluctuating diurnal water temperatures also aid in survivability of salmonids (Busby *et al.* 1996). Juvenile steelhead emigrate episodically from natal streams during fall, winter, and spring high flows, to the ocean to continue rearing to maturity.

Adults returning to spawn may migrate several miles, up to hundreds of miles in some watersheds, to reach their natal streams. Although spawning typically occurs between January and May, the specific timing of spawning may vary a month or more among streams within a region, and within streams interannually. Spawning (and smolt emigration) may continue through June (Busby *et al*. 1996). Female steelhead dig a nest in the stream and then deposit their eggs. After fertilization by the male, the female covers the nest with a layer of gravel. Steelhead do not necessarily die after spawning and may return to the ocean, sometimes repeating their spawning migration one or more years. The embryos incubate within the nest. Hatching time varies from about three weeks to two months depending on water temperature. The young fish emerge from the nest about two to six weeks after hatching.

### 2.2.3. Status of CCC Steelhead

In this opinion, NMFS assesses four population viability parameters to help us understand the status of CCC steelhead and the population's ability to survive and recover. These population viability parameters are: abundance, population growth rate, spatial structure, and diversity (McElhany *et al.* 2000). NMFS has used existing information to determine the general condition of each population and factors responsible for the current status of the DPS. We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20). For example, the first three parameters are used as surrogates for numbers, reproduction, and distribution. We relate the fourth parameter, diversity, 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.

Historically, approximately 70 populations[2] of steelhead existed in the CCC steelhead DPS (Spence *et al.* 2008, Spence *et al.* 2012). Many of these populations (about 37) 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).

While historical and present data on abundance are limited, CCC steelhead numbers are substantially reduced from historical levels. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this DPS in the mid-1960s, including 50,000 fish in the Russian River - the largest population within the DPS (Busby *et al.* 1996). Recent estimates for the Russian River are on the order of 4,000 fish (NMFS 1997). Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with recent estimates for several streams (Lagunitas, Waddell, Scott, San Vincente, Soquel, and Aptos creeks) of 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 fragmentation of habitat 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, NMFS 1997, Good *et al*. 2005, Spence *et al*. 2008, Spence *et al.* 2012, Williams *et al.* 2011.

CCC steelhead abundance has declined significantly in recent decades, and long-term population trends suggest a negative growth rate. This indicates 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, placing dependent populations at increased risk of extirpation. However, because CCC steelhead have maintained a wide distribution throughout the DPS, roughly approximating the known historical distribution, CCC steelhead likely possess a resilience that will slow their decline relative to other salmonid DPSs or Evolutionary Significant Units in worse condition. On January 5, 2006, NMFS determined that the CCC steelhead DPS

[2] Population as defined by Bjorkstedt *et al*. 2005 and McElhaney *et al*. 2000 as, in brief summary, a group of fish of the same species that spawns in a particular locality at a particular season and does not interbreed substantially with fish from any other group. Such fish groups may include more than one stream. These authors use this definition as a starting point from which they define four types of populations (not all of which are mentioned here).

remained a threatened species, as previously listed (71 FR 834). A 2008 viability assessment of CCC steelhead 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). The most recent status review reaffirmed that steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Williams *et al.* 2011).

### 2.2.4. CCC Steelhead Critical Habitat Status

Critical habitat was designated for CCC steelhead on September 2, 2005 (70 FR 52488). In designating critical habitat, NMFS considers, among other things, the essential PBFs within the designated area that are essential to the conservation of the species and that may require special management considerations or protection.

PBFs for CCC steelhead 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.

The condition of CCC steelhead 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 present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat: logging, agricultural and mining activities, urbanization, stream channelization, dams, wetland loss, and water withdrawals, including unscreened diversions for irrigation. Impacts of concern include alteration of streambank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels and large woody debris, degradation of water quality, removal of riparian vegetation resulting in increased streambank erosion, loss of shade (higher water temperatures) and loss of nutrient inputs (Busby *et al.* 1996, 70 FR 52488). Water development has drastically altered natural hydrologic cycles in many of the streams in the DPS. Alteration of flows results in migration delays, loss of suitable habitat due to dewatering and blockage; stranding of fish from rapid flow fluctuations; entrainment of juveniles into poorly screened or unscreened diversions, and increased water temperatures harmful to salmonids. Overall, current condition of CCC steelhead critical habitat is degraded, and does not provide the full extent of conservation value necessary for the recovery of the species.

A final recovery plan for CCC steelhead was prepared by NMFS in October 2016 (NMFS 2016). The plan describes key threats, actions needed to achieve recovery, and measurable criteria by which NMFS will determine when recovery has been reached. Recovery plan actions are primarily designed to restore ecological processes that support healthy steelhead populations, and address the various activities that harm these processes and threaten the species' survival. The recovery plan calls for a range of actions including the restoration of floodplains and channel structure, restoring riparian conditions, improving streamflows, restoring fish passage, protecting and restoring estuarine habitat, among other actions.

### 2.2.5. Global Climate Change

One factor affecting the range-wide status of the CCC steelhead DPS, and aquatic habitat at large is climate change. 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). CCC steelhead 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 steelhead experience, and many of these factors have much less influence on steelhead abundance and distribution than human disturbance across the landscape. In addition, CCC steelhead are not dependent on snowmelt driven streams and, thus, not affected by declining snow packs.

The threat to CCC steelhead 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 and 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).

In the San Francisco Bay region, warm temperatures generally occur in July and August, but as climate change takes hold, the occurrences of these events will likely begin in June and could continue to occur in September (Cayan *et al*. 2012). Climate simulation models project that the San Francisco region will maintain its Mediterranean climate regime, but experience a higher degree of variability of annual precipitation during the next 50 years as well as years that are drier than the historical annual average during the middle and end of the 21st Century. The greatest reduction in precipitation is projected to occur in March and April, with the core winter months remaining relatively unchanged (Cayan *et al.* 2012).

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 *et al.* 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 is located adjacent and within the bed and banks of Los Trancos Creek disturbed by Project activities, including the approximate 352 feet of dewatered creek where the existing gabion and weir structures will be replaced with a rock ramp and pools, and flood bench, the area of the creek exposed to effects from the seismic upgrade of Bent 2, and also approximately 300 feet immediately downstream of the dewatered area where temporary construction effects may occur. The section of the creek within the Project footprint has gabion mattress armoring, with the gabion extending from bank to bank (including the creek bed), and lacks vegetation due the shading from the overhead bridges.

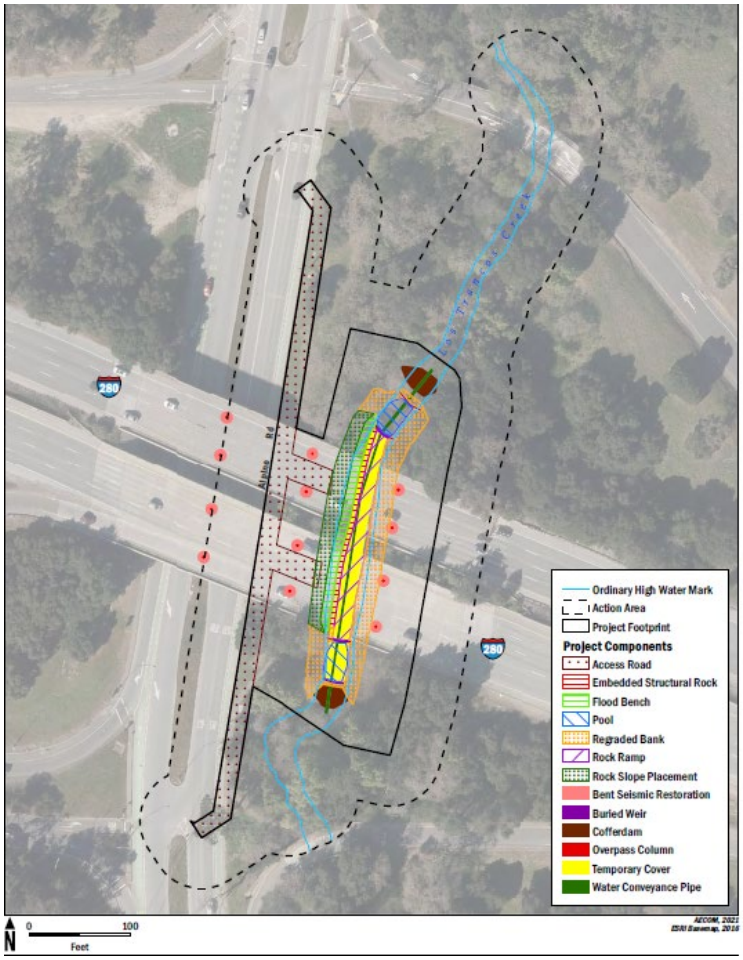


Figure 1. Action Area and Project Elements for the Alpine Road Undercrossing Bridge Seismic Restoration Project.

## 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).

Los Trancos Creek, upstream of the Project location, drains a watershed area of 6.9 square miles. Los Trancos Creek drains into San Francisquito Creek approximately 0.4 mile downstream of the Project. San Francisquito Creek and Los Trancos Creek define the boundary between San Mateo County and Santa Clara County. The larger San Francisquito Watershed drains an area of approximately 45 square miles. The headwaters are in the Santa Cruz mountains, and the main stem originates at the confluence of Bear Creek and Corte Madera Creek just below Searsville Reservoir. San Francisquito Creek flows through the cities of Menlo Park, Palo Alto, and East Palo Alto before entering San Francisco Bay. The Los Trancos Creek watershed is in the southern end of San Mateo County and borders Santa Clara County. On the Santa Clara County side, the land use of the watershed is primarily major educational and institutional uses, hillsides, and other public open lands. It is also in Stanford Lands, an unincorporated and urban area of San Mateo County. On the San Mateo County side, the land uses of the watershed are primarily residential, local shopping and service, and scenic corridor and greenway.

### 2.4.1. Status of CCC Steelhead and Critical Habitat in the Action Area

Fish surveys performed between 1905 and 2004 (Leidy et al. 2005; Wood Rogers 2004; Launer and Holtgrieve 2000) document the historic and continued presence of steelhead within Los Trancos Creek and the broader San Francisquito Creek watershed. Carmen and White (2004) summarize existing information and data concerning the steelhead run in Los Trancos Creek. Fish studies have been conducted on Los Trancos Creek since the 1970s, but the surveys performed by CDFG in 1992 and 1993 (Anderson 1995) provide the most information regarding steelhead abundance. In the summer of 1993, Anderson (1995) found several age classes of steelhead above and below Stanford University's Los Trancos Diversion facility, approximately 3 miles upstream of the action area. Sampling performed by Stanford University in August 1998 and 1999 found abundant steelhead throughout Los Trancos Creek (Launer and Holtgrieve 2000). Vogel (2000) performed snorkel surveys in Los Trancos Creek and observed abundant numbers of steelhead juveniles. Santa Clara Valley Water District (SCVWD) (2004) reports information concerning steelhead spawning habitat in Los Trancos Creek and identified many factors in the watershed that could limit steelhead productivity. These "factors" pertain primarily to fish passage barriers which are located upstream of the action area of this Project. Surveys performed by SCVWD in March and April 2003 found "relatively healthy" numbers of steelhead juveniles (SCVWD 2004). Fisheries sampling in Los Trancos Creek has not occurred recent years, but previous studies have shown that steelhead are continuously present in the stream and rearing juveniles are common. Abundance survey data are not available for the action area of this Project, but, as noted above, the barriers which limit steelhead productivity in Los Trancos Creek are located upstream of the

Project site and do not limit access in the action area. With the proposed in-water work window of June 15 to October 15, juvenile CCC steelhead are expected to be present within Los Trancos creek in the action area during the proposed summer work window.

The Project area contains an approximately 490-foot section of Los Trancos Creek, riparian and forested land adjacent to the creek, and ruderal vegetation and bare ground along the roadways and under the bridges. Los Trancos Creek is a perennial stream with connectivity to San Francisco Bay. It flows from south to north and runs under the I-280 bridges. The section of the creek within the Project footprint is armored using gabion mattress, with the gabion extending from bank to bank (including the creek bed), and is relatively barren of vegetation due to a lack of sun exposure.

The creek bed also contains a series of five concrete weirs that were originally installed for grade control and are in various states of disrepair and functionality. In the 1970s, Caltrans investigated an erosion problem at Los Trancos Creek at the location of the proposed Project location. It was determined that slope protection was needed at the bridge footings, and Caltrans initiated a channel stabilization project. The California Department of Fish and Game requested that a fish ladder be included in that project. The project included unlined channel realignment to clear the bridge footings, gabion mattress slope protection to stabilize the creek embankments, and concrete weirs with resting pools to support anadromous fish. The project installed a series of weirs with jump boxes to allow fish to travel upstream. Currently, the condition of the weirs is degraded, with erosion causing water flows to bypass some weirs, rendering them nonfunctional. Sedimentation has also reduced the functional height of the weirs and partially filled jump boxes, further reducing the utility of both. These weirs are currently considered partial fish passage barriers, limiting upstream travel of fish during low water flow conditions.

Under the I-280 overpass, the low-flow channel measures between 13 and 14 feet wide, and the active floodplain at OHWM measures between 34 and 39 feet wide. The substrate is predominantly cobble and gravel, mixed with sand in the low-flow channel. Instream vegetative cover is approximately 10 percent. Upstream and downstream of the overpass, the creek is narrower, varying between 17 and 28 feet wide at OHWM, with a low flow channel between 5 and 10 feet wide. There are trees and shrubs along the steep banks of Los Trancos Creek, but there is minimal to no vegetation directly under the I-280 bridges due to a lack of sunlight and bare compacted soil. Where sunlight penetrates, the banks of Los Trancos Creek are vegetated by riparian and oak woodland species. Tree species that are present include willows, coast live oaks, valley oaks, big leaf maple, and alders.

### 2.4.2. Factors Affecting the Species Environment in the Action Area

Urbanization has resulted in flashy hydrology (streamflows rise and fall quickly with storm events) due to the large areas of impervious surface throughout urbanized areas of the watershed. The increased flows have resulted in some down-cutting that has incised the channel and steepened the banks including in the action area. Los Trancos Creek stream flows through the action area are also influenced by Stanford University's (Stanford) Los Trancos Diversion Facility. This water diversion is located upstream of the action area and it operates a water diversion seasonally from December through April. Stanford exercises appropriative and riparian water rights to divert water from Los Trancos Creek. In 2009 Stanford completed upgrades to the Los Trancos Diversion Facility and initiated a program of improved bypass flows to maintain suitable downstream flow

conditions when the water intake and diversion is operating. Stanford's minimum bypass flows provide sufficient conditions for steelhead migration, spawning, incubation and rearing downstream of the point of diversion, including this project's action area. Stream flow during the summer and fall months in the action area are unaffected by this diversion, because Stanford's water right precludes diversion from Los Trancos Creek between May and November.

### 2.4.3. Previous Section 7 Consultations in the Action Area

Pursuant to section 7 of the ESA, NMFS has previously conducted a consultation for the Project Alpine Road Trail Improvements Project (NMFS Admin Record #151422WCR2014SR00072, Corps file # 2013-00150S) in the Los Trancos Creek watershed near the action area of this Project. This consultation was with the Army Corps of Engineers for the County of San Mateo Public Works Department rehabilitation of a 1.84 mile stretch of the Alpine Road Trail including three streambank restoration sites to protect the trail as well as Alpine Road and three critical pipelines from the erosional forces of Los Trancos Creek. The trail rehabilitation work extended 1.85 miles from the northern limit of the town of Portola Valley to the southern limits of the City of Menlo Park. Trail protection activities involving streambank restoration at three locations. At Site 1, just south of the Alpine Road and La Cuesta Drive intersection, an existing wood railing and concrete foundation on the west bank was replaced, and a keystone concrete retaining wall of three feet height was installed at the top of the bank beneath the railing. At Sites 2 and 3, the western creek banks at those locations were stabilized through the installation of vertical concrete and steel retaining walls. In front of the retaining walls, the creek banks were reconstructed with vegetated live log crib walls of tree trunks and root balls, and soil lifts incorporating live willow, alder, dogwood and other riparian woody species cuttings laid horizontal between soil lifts.

Additionally, NMFS has previously conducted two other interagency consultation for projects in the Los Trancos Creek watershed above the Project site that may affect the action area of this Project. The more recent is the C-1 Trail Bank Stabilization Project located along Los Trancos Creek in Portola Valley, San Mateo County, California (NMFS Admin Record number 151422SWR2010SR00263, and Corps File No. 2010-00213S). The previous consultation was with the Corps regarding Stanford University's Steelhead Habitat Enhancement Project (SHEP) (NMFS administrative record #151422SWR2004SR9240 and Corps File No. 28630S). The SHEP consultation evaluated modifications to the facilities and operational procedures at Stanford's San Francisquito Creek Pump Station in San Francisquito Creek, and the Los Trancos Creek Fish Ladder and Diversion Structure in Los Trancos Creek. The Los Trancos Diversion Facility is located approximately 3 miles upstream of the Project site and operation of this diversion effects streamflow rates through the action area between November and May. The effects of Stanford's Los Trancos Diversion Facility on CCC steelhead and their habitat are briefly described above under *Factors Effecting the Species Environment in the Action Area.* Construction of the SHEP improved fish passage at Stanford's Los Trancos Creek water intake by installing a new state-of-the-art fish ladder and fish screen, and increasing the amount of flow bypassed downstream during water diversion operations. The SHEP consultation concluded the Project was not likely to jeopardize the continued existence of threatened CCC steelhead or adversely modify CCC steelhead designated critical habitat.

Stream restoration actions occur in the CCC steelhead DPS and may include the action area and be covered by programmatic Section 7 consultations. These programmatic consultations include the

NOAA Restoration Center's (RC) restoration program and the Regional General Permit programmatic consultation with the CDFG. Both of these consultations authorize a limited amount of take for juvenile salmonids during instream work conducted in the summer months.

Section 10(a)(1)(A) research and enhancement permits and section 4(d) limits or exceptions could potentially occur in the Los Trancos Creek watershed. 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. Through 2016, no research activities have occurred in Los Trancos Creek.

#### 2.4.4. Climate Change Impacts in the Action Area

The long-term effects of climate change have been presented under the Rangewide Status of the Species and Critical Habitat section of this opinion (2.2.5). These include changes to streamflow regimes, water temperatures, and rainfall patterns. Listed species in the action area may have already experienced some detrimental impacts from climate change. These natural factors are likely less influential on fish abundance and distribution than anthropogenic impacts across the action area. Future climate change impacts in the action area are likely to increase as air and water temperatures warm, and precipitation rates change. However, during the timeframe considered in this opinion, these changes are expected to materialize as insignificant alterations to current habitat conditions in the action area.

## 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 (see 50 CFR 402.02). 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 the factors set forth in 50 CFR 402.17(a) and (b).

Construction activities associated with the Project may affect CCC steelhead and critical habitat. The effects of the proposed action are reasonably likely to include: adverse effects to CCC steelhead from fish collection and relocation; adverse effects to CCC steelhead from dewatering; insignificant effects to steelhead and habitat from temporary reductions in riparian vegetation; insignificant effects to steelhead and habitat from temporary increases in suspended sediment concentrations; a discountable potential for fish and habitat to be exposed to construction debris and materials; and permanent improvements to habitat and fish passage. These effects are presented in detail below.

#### 2.5.1. Fish Collection and Relocation

To facilitate construction, the Project proposes to dewater approximately 352 linear feet of the Los Trancos Creek stream channel, which will necessitate fish capture and relocation prior to dewatering to avoid fish stranding and exposure to construction activities. Relocation activities would occur during the summer low-flow period after emigrating smolts and kelts (post-spawned adults) have left the creek. Therefore, NMFS expects only capture of the juvenile freshwater

rearing lifestage (pre-smolt). Before and during dewatering of the two construction sites, juvenile steelhead and other fish would be captured. Collected fish would be relocated either upstream or downstream of the Project work sites; final location will depend on the quality of habitat available during actual implementation and this determination will be made by the NMFS-approved biologist conducting the work.

Data to accurately quantify the number of steelhead that would be present within the action area prior to relocation activities are not available and vary annually. Therefore, NMFS cannot precisely estimate the numbers of juvenile steelhead that will be present within the action area prior to relocation and dewatering activities. Fish relocation activities may injure or kill rearing juvenile steelhead because of the associated risk that collecting poses to fish, including stress, disease transmission, injury, or death (Hayes 1983). The amount of 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. The effects of seining and dip-netting on juvenile steelhead include stress, scale loss, physical damage, suffocation, and desiccation. Electrofishing can kill juvenile steelhead, and researchers have found serious sub-lethal effects including spinal injuries (Nielsen 1998, Nordwall 1999). Since fish relocation activities would be conducted by qualified and NMFS-approved fisheries biologists, direct effects to, and mortality of juvenile salmonids during capture would be minimized.

Although sites selected for relocating fish should have similar water temperature as the capture sites and are expected to have adequate habitat available, in some instances relocated fish may endure short-term stress from crowding at the relocation sites. Relocated fish may have to contend with other fish causing increased competition for available resources such as food and habitat area. Frequent responses to crowding by steelhead include emigration and reduced growth rates (Keeley 2003). 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 steelhead. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. NMFS does not expect impacts from increased competition would be large enough to adversely affect the survival chances of individual steelhead, or cascade through the watershed population based on the small area that would likely be affected and the relatively small number of individuals likely to be relocated (particularly when compared with the remainder of individuals throughout the drainage not affected by the Project). Sufficient habitat appears to be available in Los Trancos Creek to sustain fish relocated without crowding of other juvenile steelhead.

Based on information from other relocation efforts, NMFS estimates injury and mortalities would be less than three percent of those steelhead that are relocated. Data on fish relocation efforts since 2004 shows most mortality rates are below three percent for steelhead (Collins 2004, CDFG 2005, 2006, 2007, 2008, 2009, 2010a, 2010b). Fish that avoid capture during relocation efforts may be exposed to risks described in the following section on dewatering. NMFS expects no more than 3% of steelhead would be will be injured or killed during fish capture and relocation activities.

### 2.5.2. Dewatering

The Project proposes to isolate the work area with cofferdams and bypass streamflow around the approximately 352 feet of Los Trancos Creek where instream work will occur. Water from the

construction area (construction water pumped from active work area) will be discharged to an upland location where it will not drain sediment-laden water back to the stream channel. NMFS anticipates only minor temporary changes to instream flow within the action area during the dewatering process prior to construction. These fluctuations in flow are anticipated to be small, gradual, and short-term. Once the cofferdams and pipeline bypass are installed and operational, stream flow above and below the two work sites should be the same as the pre-Project conditions except within the dewatered work areas where stream flow is bypassed. The dewatering of approximately 352 feet of channel is expected to cause a temporary reduction of aquatic habitat. Juvenile steelhead that avoid capture in the Project work area following relocation efforts may die due to desiccation, thermal stress, or by being crushed by equipment or foot traffic if not found by biologists while water levels within the reach recede. However, due to fish relocation efforts, NMFS expects the number of juvenile steelhead that would die as a result of stranding during dewatering activities would be less than one percent of the steelhead within the action area prior to dewatering.

The temporary cofferdams and water diversion structures in the creek at the de-watering site is not expected to impact juvenile steelhead movements in Los Trancos Creek beyond typical summer low-flow conditions. Steelhead experience intermittent conditions in many streams of the CCC ESU during summer, and the limited duration of water diversion is unlikely to adversely affect individual steelhead rearing upstream or downstream of the dewatered reach.

Benthic (i.e., bottom dwelling) aquatic macroinvertebrates (a salmonid prey item) within the dewatered area may be killed or their abundance reduced when creek habitat is dewatered (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from stream flow diversions and dewatering will be temporary because construction activities would be relatively short-lived and the dewatered reaches are small. Rapid recolonization (typically one to two months) of disturbed areas by macroinvertebrates is expected following channel re-watering (Cushman 1985, Thomas 1985, Harvey 1986). Based on the foregoing, NMFS does not expect the loss of aquatic macroinvertebrates as a result of dewatering activities would adversely affect CCC steelhead during and after Project implementation. Because of the rapid recolonization by macroinvertebrates of the dewatered sections, NMFS does not expect the dewatering will have any lasting effects on critical habitat, thus does not anticipate that critical habitat will be adversely affected by the temporary dewatering.

As described above, NMFS expects injury and mortality of juvenile steelhead associated with fish relocation to be less than three percent of the total number of steelhead captured, and mortality associated with dewatering activities to be less than one percent of the number of steelhead present within the action area prior to dewatering.

### 2.5.3. Increased Mobilization of Sediment in the Stream Channel

The proposed action would result in the disturbance of the streambed and banks for equipment access, construction work including replacement of the existing gabion and weir structures with a rock ramp and pools, and channel grading. Disturbed soils may become mobilized when fall and winter storms increase stream flow levels post construction. NMFS anticipates these activities would result in small, short-term increases in turbidity during re-watering and subsequent higher flows during the first winter storms. 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, and Spence *et al.* 1996).

Increases in sediment may affect fish in a variety of ways. High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordon 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 and prolonged turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and can also 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 can 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 thereby reducing the amount of potential cover and habitat available, and smother coarse substrate particles which can impair macroinvertebrate composition and abundance (Sigler *et al.* 1984, Alexander and Hansen 1986).

Although chronic elevated sediment and turbidity levels may affect steelhead as described above, sedimentation and turbidity levels associated with this Project during cofferdam construction and removal, and the subsequent rewetting of the construction sites within the action area and during subsequent rainfall events are not expected to rise to the levels discussed in the previous paragraph because the Project proposes several soil and channel stabilization measures to prevent the mobilization of sediment.

Due to the comprehensive Project minimization measures and implementation of BMPs throughout the construction phase of the Project, NMFS anticipates any resulting elevated turbidity levels would be small and only occur for a short time, well below levels and durations shown in the scientific literature as causing injury or harm to salmonids (see for example Sigler *et al.* 1984 or Newcombe and Jensen 1996) or to salmonid prey species. NMFS expects any sediment or turbidity generated by the Project would not extend more than 100 feet downstream of the work sites based on the site conditions (low flows) and methods used to control sediment and turbidity (isolation of the work space from stream flows, implementation of BMPs throughout construction, *e.g.,* silt fences, straw wattles, grass seeding, *etc*.). NMFS does not anticipate harm, injury, or behavioral impacts to CCC steelhead associated with exposure to the minor elevated suspended sediment levels that would be generated by this Project. Because of the comprehensive minimization measures and BMPs developed for the Project, and the temporary nature of any elevated turbidity levels, NMFS also does not expect adverse effects will occur to critical habitat from increased sedimentation and turbidity generated by Project activities.

### 2.5.4. Toxic Chemicals

Oils and similar substances from construction equipment can contain a wide variety of polynuclear aromatic hydrocarbons (PAHs) and metals. Both can result in adverse impacts to salmonids. 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). Some of the effects that metals can have on salmonids are immobilization and impaired locomotion, reduced growth, reduced reproduction, genetic damage, tumors and lesions, developmental abnormalities, behavior changes (avoidance), and impairment of olfactory and brain functions (Eisler 2000).

The Project has proposed several measures to prevent the discharge of contaminants and avoid degradation of creek waters during construction activities. The stream would be dewatered when construction equipment is working in the streambed; spill containment and remediation material would be nearby; and vehicles would not be fueled or otherwise serviced within the stream bed. Due to these measures, NMFS expects that an accidental spill and toxic chemical contamination of the action area would be unlikely.

### 2.5.5. Removal of Riparian Vegetation

Riparian vegetation helps maintain stream habitat conditions necessary for steelhead. Riparian zones 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 stream bank 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. Where riparian vegetation is impaired, steelhead may be exposed to poor: shade, substrate, water quality, habitat diversity, cover, and shelter. These habitat impairments have the potential to limit or preclude successful spawning and rearing, reduce adult migration success, and expose juveniles and smolts to increased predation.

This Project will result in temporary reductions in riparian vegetation due to the removal and replanting of riparian vegetation that will occur throughout the approximately 352-foot-long Project area. Because riparian vegetation typically begins to provide habitat benefits relatively rapidly during reestablishment, usually within the first one to two years following planting, these impacts will be temporary. However, during the approximately one- to two-year-long duration while the riparian vegetation is beginning to reestablish, steelhead in the action area will be exposed to reduced riparian cover; potentially exposing them to habitat limitations described in the preceding paragraph. During this period, rearing juveniles may seek alternative areas where suitable cover exists nearby, and migrating adults and smolts may encounter instream habitat within the action area that lacks complexity, cover and velocity refuge. Temporary displacement of the densities of juveniles expected to occur in the action area is not expected to reduce individual performance because available cover nearby is expected to accommodate additional displaced juveniles without resulting in overcrowding.

Reduced riparian cover could expose migrating adults and smolts to impaired migration or increased predation. Depending on the severity of exposure, injury or mortality of individuals could result. For this Project, CCC steelhead smolts and adults will be transiting through the action area quickly and will experience the effects for a short period of time only. This level of exposure is not expected to increase injury or mortality, decrease fitness, or impair migrations. Further, these conditions are expected to be relatively short-lived (approximately one- to two-years in duration) because riparian vegetation is expected to rapidly recolonize the affected areas following revegetation of the site, and temporary impacts to riparian habitat will likely have an insignificant impact on the function and ability of that habitat to meet the short-term and long-term needs of steelhead in Los Trancos Creek. Also, since removed native riparian trees will be replaced with

new trees, temporarily reduced riparian function will be restored and a long-term increase in riparian cover within the action area will occur. Thus, although effects to riparian habitat are expected to affect critical habitat and CCC steelhead, the level of effects associated with this Project are expected to be insignificant.

### 2.5.6. Fish Passage and Channel Form and Function

Fish passage at the Project site is currently impaired. Under the current condition, a gabion mattress and five existing v-notch concrete weirs are partial fish passage barriers at the site. The proposed Project will remedy this condition by removing the gabion mattress and weirs, and installing a series of rock ramps and pools that will provide adequate depth and rest areas for adult and smolt-stage steelhead, improving fish passage. A V-shaped notch will also be placed along the channel centerline to allow for adequate fish passage depth during low flow periods. Furthermore, the proposed floodplain bench on the left bank will create an area for higher flows to spread out and dissipate energy. Therefore, the Project will result in improved critical habitat, and improved fish passage for adult and smolt CCC steelhead.

RSP and other cut and fill work would impact approximately 200 linear feet along the west bank and 187 linear feet along the east bank. By design, streambank stabilization projects prevent lateral channel migration, effectively forcing streams into a simplified linear configuration that, without the ability to move laterally, instead erode and deepen vertically (Leopold et al. 1968; Dunn and Leopold 1978). The resulting "incised" channel fails to create and maintain aquatic and riparian habitat through lateral migration, and can instead impair groundwater/stream flow connectivity and repress floodplain and riparian habitat function. The resulting simplified stream reach typically produces limited macroinvertebrate prey that results in poor functional habitat for rearing juvenile salmonids (Florsheim et al. 2008).

The proposed RSP for this Project is expected to maintain simplification of habitat in the future. However, The Project through the reconstruction of 309 linear feet of channel would enhance the functional value of aquatic resources through the construction of a riffle-pool channel complex. This action would increase the amount of available spawning and rearing habitat, contribute to low velocity and predator avoidance refugia, add habitat complexity and diversity, restore natural sediment transport processes, and enhance prey item densities. These Project benefits likely would increase juvenile steelhead growth, abundance, and survival. The instream habitat enhancements would also likely contribute to channel and streambank stability, increase retention of organic matter, and dissipate energy. Streambank stabilization and riparian replanting may reduce sedimentation from watershed and bank erosion, decreasing turbidity levels, and improving water quality for steelhead over the long term. Upon completion of instream work and cofferdam removal, instream habitat may be temporarily decreased due to equipment disturbance and redistribution of gravel within the construction area. Disturbance from using heavy equipment in the streambed is expected to be minimized with winter high flow events that will redistribute gravels and restore channel form.

### 2.5.7. Impacts to Critical Habitat

Features of critical habitat for CCC steelhead found within the action area include sites for migration, spawning, and rearing. Effects of the proposed Project on designated critical habitat may include elevated turbidity, streambank and floodplain habitat degradation, and precluding

natural fluvial and geomorphic channel dynamics. In order to install the 309 linear feet of rock weirs and pools, construct the floodplain bench, and place the rip-rap armoring onto the streambank, heavy machinery will operate within the stream channel. The proposed disturbance of the site will likely dislodge previously armored and sequestered inter-gravel fine sediment and allow it to be mobilized and transported downstream when the action area re-waters the following rainy season.

As mentioned above, streambank stabilization projects prevent lateral channel migration and simplify the channel. The RSP and armoring on both sides of the channel will hinder channel migration and riparian development along Los Trancos Creek. However, this channel is already heavily constrained by urbanization and the construction of a riffle-pool channel complex would increase the amount of available spawning and rearing habitat, contribute to low velocity and predator avoidance refugia, add habitat complexity and diversity, restore natural sediment transport processes, and overall improve CCC steelhead critical habitat in the Project area.

## 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.

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 earlier in the discussion of environmental baseline (Section 2.4).

## 2.7. Integration and Synthesis

The Integration and Synthesis section is the final step in assessing the risk that the proposed action poses to species and critical habitat. 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.

CCC steelhead are listed as threatened. 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 have experienced severe declines. The Project proposes to dewater an approximately 352 linear foot section of Los Trancos Creek. The Project is scheduled to be completed during the dry season; and, therefore, it is anticipated that low numbers of steelhead are expected to be present. Due to the timing of construction, no adult or smolt life stages of steelhead would be affected by the Project.

As described in the *Effects of the Action* section above, NMFS identified dewatering and fish relocation as the adverse effects on CCC steelhead and critical habitat. Prior to dewatering the site, fish would be collected and relocated from the work areas. Fish that elude capture and remain in the Project area during dewatering may die due to desiccation or thermal stress, or be crushed by equipment or foot traffic if not found by biologists during the drawdown of stream flow. However, based on the low mortality rates for similar capture and relocation efforts, NMFS anticipates few juvenile steelhead would be injured or killed by fish relocation and construction activities during implementation of the Project. Anticipated mortality from capture and relocation is expected to be less than three percent of the total number of fish relocated, and mortality expected from dewatering is expected to be less than one percent of the fish in the action area prior to dewatering. Due to the relatively large number of juveniles produced by each spawning pair, steelhead spawning in the San Francisquito Creek watershed in future years are likely to produce enough juveniles to replace the few that may be lost at the Project construction sites due to relocation and dewatering. It is unlikely that the small potential loss of juveniles by this Project would impact future adult returns.

As described in 2.4.1. *Status of CCC Steelhead and Critical Habitat in the Action Area*, habitat conditions in the action area are currently poor for steelhead. Fish passage is poor, habitat complexity is lacking, substrate complexity is poor, and channel instability is present. Effects to CCC steelhead critical habitat from the proposed Project are expected to include temporary impacts due to Project construction, and permanent benefits due to habitat enhancement. The temporary impacts are expected to be associated with disturbances to the stream bed, bank, riparian corridor, and surface flow. As discussed above, these temporary impacts are not expected to adversely affect PBFs of CCC steelhead critical habitat because aquatic habitat at the site would be restored after the water diversion system is removed. The permanent improvements to riparian condition, instream habitat, and passage are expected to result in benefits to critical habitat within the action area.

In California, climate change is expected to result in higher average summer air temperatures, lower total precipitation, reductions in the amount of snowfall and rainfall, and reduced streamflow levels in Northern and Central Coastal rivers and streams. Estuaries may also experience changes in productivity due to changes in freshwater flows, nutrient cycling, and sediment amounts. For this Project, construction will occur over a one-year period with all adverse effects associated with the Project occurring during construction. The above effects of climate change are unlikely to be detected with that time frame. 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 populations. The effects of the proposed Project combined with moderate climate change effects may result in conditions similar to those produced by natural ocean-atmospheric variations as described in the Environmental Baseline section of this opinion (Section 2.4) and annual variations. CCC steelhead 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 of threatened CCC steelhead 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). "Harass" is further defined by interim guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

### 2.9.1. **Amount or Extent of Take**

In the biological opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

NMFS anticipates that the take of juvenile CCC steelhead associated with the Seismic Restoration of the Interstate 280 bridge crossing at Alpine Road, and the construction of a riffle/pool complex in Los Trancos Creek between the borders of San Mateo County and Santa Clara County, California will be in the form of harm, injury, or mortality caused by dewatering approximately 352 linear feet of Los Trancos Creek and fish relocation over a period of four months.

The precise number of CCC steelhead that are likely to be taken by the Project cannot always be accurately quantified because steelhead: (1) are relatively small (especially as eggs, alevins, and juveniles); and (2) live in aquatic environments where visibility is often low, hiding cover is often available, and predators feed. In cases where NMFS cannot specify a quantity of individuals that are expected to be incidentally taken by the action, incidental take must be quantified using a surrogate as an extent. Thus, NMFS has used the maximum percentage of three percent-expected injury or mortality of listed CCC steelhead to be incidentally taken.

Take of listed juvenile and CCC steelhead may occur during fish relocation and dewatering in a maximum of 352 linear foot reach at the Project site between June 15 and October 1. 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-year juvenile life stage. NMFS expects that no

more than 3 percent of juvenile steelhead within the maximum of 352 linear foot dewatering area of Los Trancos Creek will be injured, harmed, or killed during fish relocation and dewatering activities. If more than 3 percent of the total number juvenile steelhead captured are harmed or killed, incidental take will have been exceeded.

### 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 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 (RPM) are necessary and appropriate to minimize take of CCC steelhead:

(1) Undertake measures to ensure that harm and mortality to listed steelhead resulting from fish relocation and dewatering activities is low.

(2) Undertake measures to minimize harm to CCC steelhead and degradation of aquatic habitat resulting during and from construction of the Project.

(3) Undertake measures to monitor the performance of the Project's post-construction revegetation performance.

(4) Prepare and submit reports which summarize the effects of construction, fish relocation, and dewatering activities, and post-construction site performance.

### 2.9.4. **Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the ESA, the federal action agency must comply (or must ensure that any applicant complies with the following terms and conditions. Caltrans 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. At least 60 days prior to the initiation of construction, a stream dewatering plan and a fish relocation plan shall be provided to NMFS for review and approval.

    b. Captured fish shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool,

shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish shall not be removed from this water except when released. To avoid predation, the biologist shall have at least two containers and segregate young-of-year fish from larger age classes and other potential aquatic predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which habitat condition are present to allow for adequate survival of transported fish and fish already present.

c. If any salmonids are found dead or injured, the biologist shall contact NMFS biologist Andrew Trent by phone immediately at (707) 578-8553 or the NMFS North-Central Coast Office at (707) 575-6050. The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All salmonid mortalities will be retained until further direction is provided by the NMFS biologist listed above.

   Tissue samples are to be acquired from each mortality prior to freezing the carcass per the methods identified in the NMFS Southwest Fisheries Science Center Genetic Repository protocols: Either a one (1) cm square clip from the operculum or tail fin, or alternately, complete scales (20-30) should be removed and placed on a piece of dry blotter/filter paper (e.g., Whatman brand). Fold blotter paper over for temporary storage. Samples must be air-dried as soon as possible (don't wait more than 8 hours). When tissue/paper is dry to the touch, place into a clean envelope labeled with Sample ID Number. Seal envelope.

   Include the following information with each tissue sample using the Salmonid Genetic Tissue Repository form or alternative spreadsheet: Collection Date, Collection Location (County, River, Exact Location on River), Collector Name, Collector Affiliation/Phone, Sample ID Number, Species, Tissue Type, Condition, Fork Length (mm), Sex (M, F or Unk), Adipose Fin Clip? (Y or N), Tag? (Y or N), Notes/Comments.

   Send tissue samples to: NOAA Coastal California Genetic Repository, Southwest Fisheries Science Center, 110 McAllister Way, Santa Cruz, California 95060.

2. The following terms and conditions implement reasonable and prudent measure 2:

   a. Construction equipment used within the creek channel will be checked each day prior to work within the creek 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 (top of bank to top of bank), Caltrans or their contractor will contain the spill and remove the affected sediment.

   b. In areas where concrete is used, a dry work area must be maintained to prevent conveyance of runoff from curing concrete to the surface waters of the adjacent stream at all times. Water that inadvertently contacts uncured concrete must not be discharged into surface waters.

c. Once construction is completed, all Project-introduced material (pipe, cofferdam, *etc*.) must be removed. Excess materials will be disposed of at an appropriate disposal site. All cofferdams, pumps, pipes and other diversion materials will be removed from the stream upon work completion and no later than October 15.

3. The following terms and conditions implement reasonable and prudent measure 3:

a. At least 60 days prior to the initiation of construction, Caltrans shall provide a plan to NMFS for review and approval regarding monitoring the success of the riparian vegetation.

4. The following terms and conditions implement reasonable and prudent measure 4:

a. Caltrans or the Town of Ross must provide a written report to NMFS by January 31 of the year following construction of the proposed action. The report must be provided to Andrew Trent at Andrew.trent@noaa.gov or to NMFS North-Central Coast Office, Attention: North Coast Branch Chief, 777 Sonoma Avenue, Room 325, Santa Rosa, California, 95404-6528. The report must contain, at a minimum, the following information:

**i. Construction Related Activities –** The report must include the dates construction began and was completed, a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, a description of any and all measures taken to minimize those unanticipated effects and a statement as to whether or not the unanticipated effects had any effect on 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 must include a description of the location from which fish were removed and the release site including photographs, the date and time of the relocation effort, a description of the equipment and methods used to collect, hold, and transport salmonids, the number of fish relocated by species, the number of fish injured or killed by species and a brief narrative of the circumstances surrounding 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 at this time.

### 2.11. Reinitiation of Consultation

This concludes formal consultation for the Alpine Road Undercrossing Bridge Seismic Restoration Project in Santa Clara and San Mateo Counties, California.

Under 50 CFR 402.16(a): "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: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If 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 written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action."

## 3. 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.

### 3.1. 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 and their contractors. Individual copies of this opinion were provided to the Caltrans. The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adhere to conventional standards for style.

### 3.2. 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.

### 3.3. Objectivity

Information Product Category: Natural Resource Plan

***Standards:*** This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR part 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 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 reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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