



**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

May 5, 2022

Refer to NMFS No: WCRO-2021-02989

Barrett Holland  
California Department of Transportation, District 5  
50 Higuera Street  
San Luis Obispo, California 93401

Re: Endangered Species Act Section 7(a)(2) Biological Opinion for the San Luis Obispo County Bridge Preventative Maintenance Program (BRLO-5949(151))

Dear Mr. Holland:

Thank you for 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 California Department of Transportation's (Caltrans) San Luis Obispo County Bridge Preventative Maintenance Program at Pippin Lane. Caltrans is the lead federal agency as assigned by the Federal Highway Administration, pursuant to Memoranda of Understanding 23 USC 326 and 327. The proposed action is within range of the threatened south-central California coast (S-CCC) Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss*) and designated critical habitat for the species.

The biological opinion concludes that the proposed action is not likely to jeopardize the continued existence of the threatened S-CCC DPS of steelhead or destroy or adversely modify its designated critical habitat. NMFS believes the proposed action is likely to result in incidental take of steelhead, therefore, the attached incidental take statement includes the amount and extent of anticipated incidental take with reasonable and prudent measures and terms and conditions to minimize and monitor incidental take of threatened steelhead.

Please contact Jess Fischer at [jessica.fischer@noaa.gov](mailto:jessica.fischer@noaa.gov) or (562) 533-6813 if you have a question concerning this consultation, or if you require additional information.

Sincerely,

Alecia Van Atta  
Assistant Regional Administrator  
California Coastal Office

Enclosure

cc: Kelda Wilson, Caltrans, D5 ([kelda.wilson@dot.ca.gov](mailto:kelda.wilson@dot.ca.gov))  
Randy LaVack, Caltrans, D5 ([randy.lavack@dot.ca.gov](mailto:randy.lavack@dot.ca.gov))  
Copy to E-File: ARN #151422WCR2019CC00175



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

San Luis Obispo County Bridge Preventative Maintenance Program

NMFS Consultation Number: WCRO-2021-02989

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?
South-central California steelhead ( <i>Oncorhynchus mykiss</i> )	Threatened	Yes	No	Yes	No

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

**Issued By:**   
Alecia Van Atta  
Assistant Regional Administrator  
California Coastal Office

**Date:** May 5, 2022

## Table of Contents

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	BACKGROUND .....	1
1.2	CONSULTATION HISTORY .....	1
1.3	PROPOSED FEDERAL ACTION .....	2
<b>2</b>	<b>ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT.....</b>	<b>4</b>
2.1	ANALYTICAL APPROACH .....	5
2.2	RANGEWIDE STATUS OF THE SPECIES AND CRITICAL HABITAT .....	6
2.2.1	<i>Status of the Species</i> .....	6
2.2.1.1	General Life History of Steelhead .....	7
2.2.1.2	Steelhead Habitat Requirements .....	8
2.2.1.3	Influence of a Changing Climate on the Species .....	8
2.2.2	<i>Designated Critical Habitat</i> .....	9
2.2.2.1	Status of Designated Critical Habitat .....	10
2.3	ACTION AREA .....	11
2.4	ENVIRONMENTAL BASELINE.....	11
2.5	EFFECTS OF THE ACTION .....	11
2.5.1	<i>Effects of the Action on Critical Habitat</i> .....	12
2.5.1.1	Temporarily Altering Aquatic Habitat .....	12
2.5.1.2	Disturbance to the Creekbed .....	13
2.5.1.3	Alteration of Water Quality .....	13
2.5.1.4	Disturbance to Streamside Vegetation .....	13
2.5.2	<i>Effects of the Action on Threatened Steelhead</i> .....	13
2.5.2.1	Habitat Isolation Consequences for Juvenile Steelhead .....	14
2.6	CUMULATIVE EFFECTS .....	15
2.7	INTEGRATION AND SYNTHESIS .....	15
2.8	CONCLUSION .....	16
2.9	INCIDENTAL TAKE STATEMENT .....	16
2.9.1	<i>Amount or Extent of Take</i> .....	17
2.9.2	<i>Effect of the Take</i> .....	17
2.9.3	<i>Reasonable and Prudent Measures</i> .....	17
2.9.4	<i>Terms and Conditions</i> .....	17
2.10	CONSERVATION RECOMMENDATIONS.....	18
2.11	REINITIATION OF CONSULTATION .....	18
<b>3</b>	<b>DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW.....</b>	<b>19</b>
3.1	UTILITY.....	19
3.2	INTEGRITY .....	19
3.3	OBJECTIVITY .....	19
<b>4</b>	<b>REFERENCES.....</b>	<b>20</b>

## **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 USC 1531 et seq.), and implementing regulations at 50 CFR 402, as amended.

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 the California Coastal NMFS office.

### **1.2 Consultation History**

On November 18, 2021, NMFS received from the California Department of Transportation (Caltrans) a written request for formal consultation under section 7 of the ESA for the San Luis Obispo County Bridge Preventive Maintenance Program in San Luis Obispo County at the Pippin Lane Bridge. Caltrans is the lead federal agency as assigned by the Federal Highway Administration (FHWA), pursuant to two Memoranda of Understanding, 23 USC 326 and 327, which allows Caltrans to approve Categorical Exclusions and Environmental Assessments. The County of San Luis Obispo (County) is the applicant. Caltrans' written request included changes to the original proposed action dated September 6, 2019, involving in-creek work windows, dewatering, and fish relocation along with a changed effects determination of the proposed action on threatened south-central California steelhead (*Oncorhynchus mykiss*). NMFS issued a letter of concurrence for the original proposed action on October 4, 2019.

During the June 1 – October 31, 2021, construction season, Caltrans completed work at two of the six bridges: Picachio Road and the Lopez Drive Spillway. Only a portion of the work was completed at Villa Creek Road due to a lack of material. Caltrans is now proposing that work at the North Ocean Avenue and Encina Avenue bridges will occur outside of the dry season work window of June 1 – October 31. No work was done at the Pippin Lane Bridge due to material shortages and concerns for steelhead presence when considering a work window extension past October 31, 2021. No steelhead was observed at the Pippin Lane bridge during surveys conducted on August 26, October 21, and October 25, 2021, though water levels were suitable for juvenile movement with a deep holding pool just upstream of the bridge. In May 2020, several steelhead were seen holding in this pool. These recent water level and steelhead observations since the 2019 consultation suggest a higher likelihood of steelhead presence within the action area than previously thought.

Following review of the consultation request, NMFS determined the information received was inadequate. NMFS and Caltrans exchanged several phone calls and emails over the following two months to clarify work windows, statuses of all six bridges, and results of steelhead surveys. Consultation was initiated on January 19, 2022.

### 1.3 Proposed Federal Action

Under the ESA, “action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02).

Caltrans together with the County will continue implementing the proposed action at six bridges throughout San Luis Obispo County. Five of the six bridges span creeks that are designated critical habitat for threatened South-Central California Coast (S-CCC) Distinct Population Segment (DPS) of Steelhead (71 FR 834<sup>1</sup>). Work at Picchio Road Bridge and Lopez Drive Spillway Bridge were completed June 1 – October 31, 2021, with partial work done at Villa Creek Road. Caltrans proposes to complete work at the Villa Creek Road Bridge and Pippin Lane Bridge June 1 – October 31, 2022. Caltrans is no longer proposing a seasonal work window for the North Ocean Avenue Bridge or Encina Avenue Bridge, with wet season construction being a possibility.

Dewatering is proposed at the Pippin Lane Bridge. See Canyon Creek under Pippin Bridge is expected to have low flow during the proposed action, therefore steelhead may be present. See Table 1 for the creek and bridge locations in the action area.

Table 1. Details of the bridges and associated creeks that are the basis of the proposed action

<b>Bridge Name and Number</b>	<b>Creek</b>	<b>Designated Critical Habitat</b>	<b>Construction Status</b>
Villa Creek Rd Bridge (No. 49C-0094)	Villa Creek	Yes	Partially completed; resume summer 2022
Picachio Rd Bridge (No. 49C-0385)	Cayucos Creek	Yes	Completed
Pippin Ln Bridge (No. 49C-0391)	See Canyon Creek	Yes	Planned for summer 2022
N Ocean Ave Bridge (No. 49C-0341)	Cayucos Creek	Yes	Planned for 2022
Lopez Dr Spillway Bridge (No. 49C-0353)	Arroyo Grande	Yes	Completed
Encina Ave Bridge (No. 49C-0173)	Yerba Buena Creek	No	Planned for 2022

---

<sup>1</sup> Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead. Federal Register, Vol 71, No. 3. January 5, 2006.

Under the proposed action, the County would replace deteriorating wood lagging on the abutments and wingwalls of the bridges, abrasively clean exposed rebar, replace any loose concrete, replace a portion of a spalled-out soffit (bottom of the deck), replace joint seals, treat the structures with methacrylate resin, and apply cement sealing to the soffit, edge of deck, abutments, and wingwalls as necessary.

At Pippin Lane Bridge, proposed activities include replacing deteriorating wood lagging on the back side of the abutments and wingwalls from the roadway and shoulder behind the structure. The excavated areas behind the abutments will be backfilled with existing and imported materials, a geo-composite drain will be installed behind the new lagging, and the disturbed embankment will be reconstructed and hydroseeded. Some vegetation trimming is proposed to gain access to the action area, but no trees will be removed. Surface water in See Canyon Creek will be temporary diverted around the work area and any steelhead will be relocated.

Prior to dewatering, Caltrans proposes to relocate any steelhead within the action area. The proposed fish relocation plan details criteria for suitable relocation sites, steelhead handling precautions using 1/8-inch mesh nets and aerated buckets of cool water, procedures for preserving any steelhead mortalities for NMFS, biologist experience, and reporting details. In summary, block nets will be used to isolate the area to be dewatered, steelhead will be captured with seine or dip nets, transported in buckets of water, and released in pre-determined relocation sites.

For the water diversion, cofferdams will be constructed with washed gravel-filled bags and impermeable plastic sheeting. A 24-inch pipe will be used to direct flow through the 80-foot work area. If surface flow is present after the diversion is installed, the water will be pumped into a temporary sediment basin before being discharged downstream. Pumps will be screened to prevent fish entrainment, though Caltrans does not specify the screen size. A biologist will conduct daily monitoring of the area. Upon completion of the proposed action, the diversion will be removed and the creek bed will be restored to preexisting conditions.

The wood lagging of the western abutment at Villa Creek Road Bridge was replaced in 2021, but the bent cap and stringers were not due to lack of material. The western abutment is 20 feet from Villa Creek's active channel, and no work is proposed for the eastern abutment. Caltrans proposes to resume work on the western abutment during the June 1 – October 31, 2022 work window, with no work occurring below the ordinary high-water mark.

At North Ocean Avenue Bridge, proposed activities include abrasive cleaning of exposed rebar, removal/replacement of any loose concrete, and replacement of a portion of the spalled-out soffit. All work will be conducted from the existing bridge deck. Debris and dust will be contained and vacuumed, stored in leak-proof containers, and removed from the action area. The containment system will be supported by scaffolding and bracing secured to the bridge soffit. No additional avoidance measures are proposed with the elimination of the seasonal work window.

At Encina Avenue Bridge, proposed activities include bridge deck methacrylate resin treatment and cement sealing the soffit, edge-of-deck, abutments, and wingwalls. All work will be done by hand, and no equipment will enter Yerba Buena Creek, though there will be minimal foot traffic in the dry creek. Tarps will be placed on the ground to prevent any materials from entering the dry creek. No additional avoidance measures are proposed with the elimination of the seasonal work window.

Activities at Pippin Lane Bridge and Villa Creek Road Bridge are proposed to take place during the dry season (June 1 – October 31). A work window is no longer proposed for North Ocean Avenue Bridge or Encina Avenue Bridge. The bridges at Villa Creek Road and Encina Avenue will take approximately one week each, the bridge at North Ocean Avenue will take approximately two weeks, and Pippin Lane Bridge will take approximately three weeks.

The following avoidance and minimization measures are included in the proposed action:

- Prior to construction, a spill plan will be developed in the event of accidental spills.
- During construction, erosion control measures (e.g., silt fencing, fiber rolls, and barriers) will remain available on-site and will be utilized as necessary to prevent erosion and sedimentation in jurisdictional areas. Erosion control measures and other suitable best-management practices will be checked to ensure that they are intact and functioning effectively, and maintained on a daily basis throughout the duration of construction. Dust-control techniques, such as site watering, during construction to protect water quality will be implemented as well.
- During construction, the cleaning and refueling of equipment and vehicles will occur only within a designated staging area and at least 100 feet (30 meters) from wetlands or other aquatic areas. At a minimum, equipment and vehicles will be checked and maintained on a daily basis to ensure proper operation and avoid potential leaks or spills.
- Prior to construction, the County will prepare a restoration plan that provides 1:1 restoration for temporary adverse effects, unless otherwise directed by regulatory agencies. Any revegetation will be conducted using only native plant species.

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would not.

## **2 Endangered Species Act: Biological Opinion and Incidental Take Statement**

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provide

an opinion stating how the agency’s actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes 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 S-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 habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat,

analyze whether the proposed action is likely to: (1) directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species, or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

- If necessary, suggest a reasonable and prudent alternative to the proposed action.

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

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" 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 Status of the Species**

The threatened S-CCC DPS of steelhead occupies rivers from the Pajaro River, Santa Cruz County, south to but not including the Santa Maria River, in Santa Barbara County. The decline of the species prompted listing of the S-CCC DPS of steelhead as threatened on August 18, 1997 (62 FR 43937) and a revised listing on January 5, 2006 (71 FR 834). The status of the S-CCC steelhead populations was assessed by NMFS' Biological Review Team (BRT) in 1996 (Busby et al.), 2005 (Good et al.), 2011 (Williams et al.), and 2016 (NMFS). Abundance of adult steelhead in the S-CCC DPS declined from a historical high abundance of 25,000 returning adults, to an estimate of 4,750 adults in 1965 for five river systems (Pajaro, Salinas, Carmel, Little Sur, and Big Sur), to fewer than 500 adults currently (Boughton and Fish 2003; Good et al. 2005; Helmbrecht and Boughton 2005; Williams et al. 2011).

As part of the assessment and listing of S-CCC steelhead, NMFS convened the BRT, composed of an expert panel of scientists. The BRT evaluated the viability and extinction risk of naturally spawning populations within each DPS. The BRT found high risks to abundance, productivity, and the diversity of the S-CCC DPS and expressed particular concern for the DPS's connectivity and spatial structure. NMFS' latest 5-year status review for the S-CCC DPS of steelhead states the following:

"The extended drought and drying conditions associated with projected climate change has the potential to cause local extinction of *O. mykiss* populations and thus reduce the genetic diversity of fish within the South-Central California Coast Steelhead Recovery Planning Area." (p. 55, NMFS 2016)

Moreover, NMFS' recent assessment of viability for steelhead provides an indication that the S-CCC Steelhead DPS may be currently experiencing an increased extinction risk (Williams et al. 2016).

#### 2.2.1.1 General Life History of Steelhead

*O. mykiss* possesses an exceedingly complex life history (Behnke 1992). Distinctly different than other Pacific salmon, steelhead adults can survive their first spawning and return to the ocean to reside until the next year to reproduce again. For returning adults, the specific timing of spawning can vary by a month or more among rivers or streams within a region, occurring in winter and early spring. The spawning time frames depend on physical factors such as the magnitude and duration of instream flows and sand-bar breaching. Once they reach their spawning grounds, females will use their caudal fin to excavate a nest (redd) in streambed gravels where they deposit their eggs. Males will then fertilize the eggs and, afterwards, the females cover the redd with a layer of gravel, where the embryos (alevins) incubate within the gravel. Hatching time can vary from approximately three weeks to two months depending on surrounding water temperature. The young fish (fry) emerge from the redd two to six weeks after hatching. As steelhead begin to mature, juveniles or "parr" will rear in freshwater streams anywhere from 1-3 years. Juvenile steelhead can also rear in seasonal coastal lagoons or estuaries of their natal creek, providing over-summering habitat.

Juvenile steelhead emigrate to the ocean (as smolts) usually in late winter and spring and grow to reach maturity at age 2-4, but steelhead can reside in the ocean for an additional 2-3 years before returning to spawn. The timing of emigration is influenced by a variety of parameters such as photoperiod, temperature, breaching of sandbars at the river's mouth and streamflow. Extended droughts can cause juveniles to become landlocked, unable to reach the ocean (Boughton et al. 2006).

Through studying the otolith (ear stone) microchemistry of *O. mykiss*, researchers further understand the complex and intricate life history of steelhead. Specifically, resident rainbow trout can produce steelhead progeny; likewise, steelhead can yield resident rainbow trout progeny (Zimmerman and Reeves 2000). Additionally, evidence indicates that sequestered populations of steelhead (e.g., above introduced migration barriers) can exhibit traits that are the same or similar to anadromous specimens with access to the ocean. Examples include inland resident fish exhibiting smolting characteristics and river systems producing smolts with no regular access for adult steelhead. This evidence suggests the ecological importance of the resident form to the viability of steelhead and the need to reconnect populations upstream and downstream of introduced migration barriers. The loss or reduction in anadromy and migration of juvenile steelhead to the estuary or ocean is expected to reduce gene flow, which strongly influences population diversity (McElhany et al. 2000). Evidence indicates genetic diversity in populations of southern California steelhead is low (Girman and Garza 2006).

### 2.2.1.2 Steelhead Habitat Requirements

Habitat requirements of steelhead generally depend on the life history stage. Steelhead encounter several distinct habitats during their life cycle. Water discharge, water temperature, and water chemistry must be appropriate for adult and juvenile migration. Suitable water depth and velocity, and substrate composition are the primary requirements for spawning. Furthermore, dissolved oxygen concentration, pH, and water temperature are factors affecting survival of incubating embryos. The presence of interspatial spaces between large substrate particle types is important for maintaining water-flow through the nest as well as dissolved oxygen levels within the nest. These spaces can become filled with fine sediment, sand, and other small particles. Additionally, juveniles need abundant food sources, including insects, crustaceans, and other small fish. Habitat must also provide places to hide from predators, such as under logs, root wads and boulders in the stream, and beneath overhanging vegetation. Steelhead also need places to seek refuge from periodic high-flow events (side channels and off channel areas), and may occasionally benefit from the availability of cold-water springs or seeps and deep pools during summer. Estuarine habitats can be utilized during the seaward migration of steelhead, as these habitats have been shown to be nurseries for steelhead. Estuarine or lagoon habitats can vary significantly in their physical characteristics from one another, but remain an important habitat requirement as physiology begins to change while juvenile steelhead become acclimated to a saltwater environment.

### 2.2.1.3 Influence of a Changing Climate on the Species

Climate-driven changes to stream, estuarine and marine have the potential to significantly impact steelhead populations. Coupled with naturally stressful environments at the southern limit of the species distribution, multiple stressors are likely to be amplified by ongoing increases in temperature, changes in precipitation patterns, and decreases in snowpack (Mote et al. 2003; Hayhoe et al. 2004). Research suggests that a change in climate would be expected to shift species distributions as they expand in newly favorable areas and decline in marginal habitats (Kelly and Goulden 2008). When climate interacts with other stressors such as habitat fragmentation, additional threats to natural resources will likely emerge (McCarty 2001), including threats to the viability of steelhead populations. In particular, seasonal access to perennial, cool water habitats, especially smaller streams at higher elevations, will likely become more important to listed salmonids seeking refuge from unsuitable temperature and streamflow (Crozier et al. 2008).

World-wide CO<sub>2</sub> levels from human activities (*e.g.*, fossil fuel use) have been steadily increasing. Climate scientists have documented increases in global temperatures and predict continued increases (IPCC 2007). This warming is affecting large-scale atmospheric circulation patterns (Dettinger and Cayan 1995), and it is impacting climate at global, regional, and local scales (Zwiers and Zhang 2003; Cayan et al. 2008). Climate change is occurring and is accelerating (Battin et al. 2007; IPCC 2007).

Environmental monitoring data in the southwestern United States indicate changes in climatic trends that have the potential to affect steelhead life history strategy and habitat requirements. The southwest U.S. average annual temperature is projected to rise approximately 4° F to 10° F over the region by the end of the century (USGCRP 2009). Southern California is also experiencing an increasing trend in droughts, measured by the Palmer Drought Severity Index from 1958 to 2007 (USGCRP 2009). Snyder and Sloan (2005) project mean annual precipitation in central western California will decrease by about 3-percent by the end of the century. Small thermal increases in summer water temperatures have resulted in suboptimal or lethal conditions and consequent reductions in *O. mykiss* distribution and abundance in the northwestern United States (Ebersole et al. 2001). Thus, climate variability will likely be an important factor in evaluating how the *Status of the Species* is influenced by changing climate.

Wildfire frequency, intensity, and extent are all important parameters to consider when considering a changing climate and associated impacts to steelhead and their habitat. Changes in vegetation communities for this region will likely include increases in the amount of grassland and decreases in most other major vegetation communities (e.g., chaparral, riparian woodland). Based on a wildfire risk assessment in southern California, it was determined that the probability of large (>200-ha) fires ranges from a decrease of 29 to an increase of 28-percent (Westerling and Bryant 2008). The variation in range is due to the type of model used to make forecasts. Wildfires can have long-term benefits for fish habitat (such as producing influxes of spawning gravels to the stream), but in the short-term they can be catastrophic due to accumulation of fine sediment that negatively affects spawning, foraging and depth refugia (Boughton et al. 2007). Many of the foregoing climatic trends are likely to further degrade steelhead over-summering habitat in southern California by reducing stream flows and raising stream temperatures (Katz et al. 2013). Impacts to steelhead may result in increased thermal stress even though this species has shown to tolerate higher water temperatures than preferred by the species as a whole (Spina 2007). Conservation of existing steelhead populations will rely on identifying and providing unimpeded passage to the highest quality over-summering and spawning habitats which are expected to buffer habitat against changing climatic and hydrologic conditions. Habitat connectivity becomes as important as habitat quantity and quality when populations decrease and habitat is fragmented (Isaak et al. 2007).

### 2.2.2 Designated Critical Habitat

Critical habitat for the S-CCC DPS of steelhead was designated on September 2, 2005, and consists of the stream channels listed in (70 FR 52488). Critical habitat has a lateral extent defined as the width of the channel delineated by the ordinary high-water line as defined by the Corps in 33 CFR 329.11, or by its bankfull elevation, which is the discharge level on the streambank that has a recurrence interval of approximately 2 years (70 FR 52522). PBFs are components of stream habitat that have been determined to be essential for the conservation of the S-CCC DPS of steelhead, and are specific habitat components that support one or more steelhead life stages and in turn contain physical or biological features essential to steelhead survival, growth, and reproduction, and conservation. These include:

- 1) Freshwater spawning sites with sufficient water quantity and quality and adequate accumulations of substrate (i.e., spawning gravels of appropriate sizes) to support spawning, incubation and larval development.
- 2) Freshwater rearing sites with sufficient water quantity and floodplain connectivity to form and maintain physical habitat conditions and allow salmonid development and mobility; sufficient water quality and forage to support juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- 3) Freshwater migration corridors free of obstruction 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.
- 4) Estuarine areas that provide uncontaminated water and substrates; food and nutrient sources to support steelhead growth and development; and connected shallow water areas and wetlands to cover and shelter juveniles.
- 5) Marine areas with sufficient water quality to support salmonid growth, development, and mobility; food and nutrient resources such as marine invertebrates and forage fish; and near-shore marine habitats with adequate depth, cover, and marine vegetation to provide cover and shelter.

Designated critical habitat for the S-CCC DPS includes 1,249-miles of stream habitat and 3-square miles of estuary habitat within Monterey, San Benito, Santa Clara, Santa Cruz, and San Luis Obispo counties from the Pajaro River Hydrologic Sub-area south to the Estero Bay Hydrologic Unit (to but not including the Santa Maria River Hydrologic Unit). There are 30 occupied hydrologic sub-unit watersheds within the freshwater and estuarine range of the DPS. Critical habitat has a lateral extent as defined by the bankfull discharge, also known as a 2-year flood event.

#### 2.2.2.1 Status of Designated Critical Habitat

Streams designated as critical habitat in the S-CCC DPS have the above PBF attributes to varying degrees, depending on the stream location and the impacts associated with the watershed. NMFS' most recent status reviews for S-CCC steelhead (NMFS 2016) identified habitat destruction and degradation as serious ongoing risk factors for this DPS. Urban development, flood control, water development, and other anthropogenic factors have adversely affected the proper functioning and condition of some spawning, rearing, and migratory habitats in streams designated as critical habitat. Urbanization has resulted in some permanent impacts to steelhead critical habitat due to stream channelization, increased bank erosion, riparian damage, migration barriers, and pollution (NMFS 2016). Many streams within the DPS have dams and reservoirs that reduce the magnitude and duration of flushing stream flows, withhold or reduce water levels suitable for fish passage and rearing, physically block upstream fish passage, and retain valuable coarse sediments for spawning and rearing. In addition, some stream reaches within the DPS' designated critical habitat may be vulnerable to further perturbation resulting from poor land use and management decisions.

### **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).

For the creeks under Villa Creek Road Bridge, North Ocean Avenue Bridge, and Encina Avenue Bridge, the action area begins 50-feet upstream of each bridge centerline, extending 50-feet downstream of each bridge, and includes the existing road approach immediately adjacent to the existing abutments and wingwalls of each bridge. For Pippin Lane Bridge, the action area includes 500 feet downstream of the proposed water diversion where, thereafter, sedimentation effects are expected to cease, for a total of 600 linear feet of creek in the action area. The action area at all locations include the creeks, banks, and riparian corridor.

### **2.4 Environmental Baseline**

The “environmental baseline” refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency’s discretion to modify are part of the environmental baseline (50 CFR 402.02).

The Villa Creek Road Bridge over Villa Creek is east of SR-1, and north of Cayucos within the coastal zone. The North Ocean Avenue Bridge is located over the mouth of Cayucos Creek in Cayucos. The Encina Ave Bridge is located over Yerba Buena Creek in Santa Margarita. Villa Creek and Cayucos Creek is designated critical habitat for S-CCC steelhead. Because surface water within the action area of these creeks is likely to be absent or negligible if present during the dry season, NMFS does not expect steelhead at these locations during the dry season work window of June 1 – October 31, 2021, though steelhead may be present outside of this window.

The Pippin Lane Bridge over See Canyon Creek is west of SR-1, near Avila Beach. Sea Canyon Creek is designated critical habitat for S-CCC steelhead. In 2021, this section of See Canyon Creek was observed to hold at least 3 inches of flowing water throughout the dry season and *O. mykiss* were observed in the pool just upstream of the work area in May 2020. A count estimate is not available for this observation, but based on other steelhead observations in streams in San Luis Obispo County, NMFS expects up to 30 juvenile steelhead may be present during the proposed June 1 – October 31 work window.

### **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).

## 2.5.1 Effects of the Action on Critical Habitat

### 2.5.1.1 Temporarily Altering Aquatic Habitat

Installing block nets and dewatering the work area is expected to temporarily prevent a portion of See Canyon Creek from serving as a freshwater migration corridor and freshwater rearing site for threatened steelhead during approximately 3 weeks during the dry season (June 1 through October 31). The temporary loss of habitat is expected to have at least a few consequences, described as follows.

The temporary loss of habitat is expected to translate into temporary loss of aquatic macroinvertebrate forage within the action area. Aquatic insects provide a source of food for instream fish populations and may represent a substantial portion of food items consumed by juvenile steelhead. The effect of macroinvertebrate loss as a food source is expected to be negligible because food from upstream sources would be available upstream and downstream of the isolated area via drift. Consequently, the temporary loss of access to aquatic macroinvertebrates as a result of isolation activities is not expected to adversely affect forage opportunities within the area over the long term.

The temporary loss of habitat due to dewatering a portion of the creek represents an adverse effect to habitat for steelhead, for at least a few reasons. First, the loss of habitat translates into a loss of a freshwater rearing area, which is essential for the growth and survival of juvenile steelhead (the life stage expected to be present at the time the proposed action is implemented). Without freshwater rearing areas, the habitat cannot fulfill the intended conservation role for the species. Second, the quality and availability of habitat in the action area has already been diminished and reduced due to anthropogenic factors. Therefore, the loss of habitat due to isolation represents further loss of habitat. However, the area impacted by the nets and dewatering is relatively small compared to the amount and extent of habitat available elsewhere in See Canyon Creek and, perhaps more importantly, the nets and diversion will be removed following completion of the proposed action and the creek bed will be restored to pre-project conditions. Freshwater rearing habitats upstream and downstream of the action area will be unaffected by the proposed action and, therefore, continue providing the intended conservation role for the species. Overall, the loss of aquatic habitat associated with the dewatering will be temporary, and no long-term diminishment is anticipated from the proposed action in the physical capacity of the habitat to serve the intended functional role for steelhead.

#### 2.5.1.2 Disturbance to the Creekbed

Although manipulation and disturbance of the creek bed can result in changes to channel morphology and hydraulic conditions that may create impediments to steelhead migration, review of the proposed action indicates the placement of the block nets and coffer dams in See Canyon Creek are not expected to result in any change to channel morphology. As a result the habitat characteristics and conditions that are important to sustain steelhead migration through this reach are expected to remain the same. The proposed action is not anticipated to appreciably reduce the functional value of the action area as a site of freshwater migration or rearing.

#### 2.5.1.3 Alteration of Water Quality

NMFS does not expect acute or chronic effects on aquatic habitat in See Canyon, Villa, Cayucos, or Yerba Buena Creek because substantive increases in sedimentation and turbidity levels resulting from construction activities are expected to be minimal and temporary, for a few reasons. First, the proposed action includes a number of sediment and erosion-control measures to reduce the likelihood that sediment would be introduced to the wetted area. Second, the proposed BMP that are intended to preclude equipment leaks from reaching the creek channel are expected to be efficient in this regard. As a result, we don't expect water-quality alterations due to equipment leaks. Although accidental spills of chemical contaminants are speculative, the proposed action incorporates measures to prevent a spill reaching the creek channel. Caltrans has not proposed any additional wet season BMP for North Ocean Avenue Bridge or Encina Avenue Bridge.

#### 2.5.1.4 Disturbance to Streamside Vegetation

The proposed action has the potential to temporarily cause a discrete loss of shade and cover along See Canyon and Villa Creeks. This loss has the potential to translate into increased water temperatures (Mitchell 1999; Opperman and Merenlender 2004) and decreased water quality (Welsch 1991). However, the loss of vegetation as a result of the proposed action is expected to be temporary and confined to a small localized area. In addition, riparian vegetation will be replanted throughout the disturbed areas to minimize impacts from project construction. Based on NMFS' experience observing the response of riparian vegetation to human-made disturbances, the riparian zone is expected to recover from the project one to two years following the completion of construction.

#### 2.5.2 Effects of the Action on Threatened Steelhead

The expected effects of the action on threatened steelhead are related to the proposed isolation of a portion of See Canyon Creek. What follows is a discussion of these effects, including discussion of the expected effects due to the proposed capture and relocation of steelhead.

### 2.5.2.1 Habitat Isolation Consequences for Juvenile Steelhead

Habitat isolation is expected to have two principal consequences: (1) a loss of service to juvenile steelhead through the loss of living space, and (2) stresses related to handling and crowding owing to the capture and relocation. Each of these is explained for more fully as follows.

*Loss of Living Space.*—The temporary loss of habitat owing to isolation could translate into an adverse effect on juvenile steelhead, chiefly through the short-term loss of a freshwater rearing area and displacement of steelhead, presuming presence of this species. This could increase densities of steelhead in neighboring reaches of the creek outside the action area. However, based on our observations of the creek upstream and downstream of the action area, and our general familiarity of steelhead abundance, we anticipate that the number of steelhead experiencing a loss of service will be small. Although movement between the upstream and downstream portions of the action area will not be possible during instream construction, we anticipate relatively little movement of steelhead owing to the expected low abundance of the species in See Canyon Creek. Overall, we anticipate the presence of the nets and diversion would affect only a small number of steelhead for a few weeks during the dry season. The effect of macroinvertebrate loss on juvenile steelhead is expected to be negligible because food from upstream sources would be available downstream of the dewatered area via drift through the pipe.

*Capture and Relocation.*—Although isolating the action area has the potential to harm or kill rearing juvenile steelhead, the proposed action includes precautions to reduce the likelihood of harm and mortality. Prior to installation of the diversion, biologists will capture and relocate steelhead to the nearest suitable habitat upstream or downstream of the work space. Caltrans proposes that biologists will be experienced with steelhead handling, and will continuously monitor the placement of the nets and platform to capture and relocate stranded steelhead.

Caltrans' detailed fish relocation plan outlines procedures and documentation for the capture and relocation of juvenile steelhead within the isolated area, along with timelines for reporting relocation efforts and mortalities to NMFS. Based on our experience and familiarity with selection of relocation areas, the sites selected for relocating juvenile steelhead should have ample habitat.

Stress from crowding, including increased competition for food among juvenile steelhead in the relocation areas, is expected to be temporary, if experienced, because when the proposed action is finished steelhead will be able to colonize the area that had been isolated. In addition, the available information indicates abundance of juvenile steelhead in the action area is quite low and not likely to produce crowding effects.

Based on steelhead survey results and anecdotal observations of juvenile steelhead in the vicinity of the action area in See Canyon Creek, NMFS expects no more than 30 juvenile steelhead will need to be relocated. NMFS expects that 3 juvenile steelhead may be injured or killed as a result of the proposed action. This estimated mortality is based on NMFS' experience and knowledge

gained on similar projects in San Luis Obispo County during the last several years. Based on NMFS' general familiarity of steelhead abundance in south-central California in general, and San Luis Obispo County streams in particular, the anticipated number of juvenile steelhead that may be injured or killed as a result of the proposed action is likely to represent a small fraction of the overall watershed-specific populations and the entire S-CCC DPS of threatened steelhead. Therefore, the effects of the relocation on steelhead are not expected to give rise to population-level effects.

## **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).

NMFS is generally familiar with the activities in the action area and at this time is unaware of such actions that would be reasonable certain to occur. Consequently, no cumulative effect is likely, beyond the continuing effects of present land use that are reasonably certain to occur into the future.

## **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.

Juvenile steelhead are expected to be present in the See Canyon Creek action area during the time the proposed action will be implemented and, therefore, subject to effects of the proposed action. The main risk to individual steelhead involves effects due to capture and relocation. The adverse effects include potential injury or mortality during the process of capture and relocation, but precautions are in place to minimize, if not eliminate, the risk of injury and mortality, and upstream and downstream habitats are expected to suitably harbor the relocated steelhead. The

expected effects associated with the habitat alteration due to platform installation will be short lived and localized.

Based on steelhead surveys and observations described in the environmental baseline section, NMFS concludes non-lethal take of no more than 30 juvenile steelhead that may be captured and relocated during the construction season as a result of isolating the action area, with a potential lethal take of no more than 3 out of the 30, thus the risk of mortality is low. Any juvenile steelhead present in the action area likely make up a small proportion of the SC DPS of steelhead.

Overall, the impacts to habitat are expected to be temporary and not translate into a reduction in the functional value of the habitat in the long term. Vegetation trimming is not expected to appreciably decrease the function of the riparian zone in any of the creeks. The impacts from disturbing the streambed in See Canyon Creek are not expected to adversely affect the quality or quantity of aquatic habitat; rather, the proposed action is expected to at least maintain existing steelhead passage and rearing characteristics and conditions in the localized area. Maintained passage conditions are expected to favor the viability of the threatened S-CCC DPS of steelhead.

The action area could be subject to higher average summer temperatures and lower precipitation levels in the future as a result of climate change, which would lead to higher creek temperatures and longer dry periods. Reductions in the amount of precipitation would reduce the amount and extent of flow. For this project, the above effects of climate change are unlikely to be detected by the time construction is completed. The short-term effects of the proposed action are expected to have completely elapsed prior to these climate-change effects.

## **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 S-CCC steelhead and or destroy or adversely modify its designated critical habitat.

## **2.9 Incidental Take Statement**

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "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: All steelhead within the action area of See Canyon Creek at Pippin Lane Bridge, expected to be no more than 30 juveniles that are captured or harassed during project activities. No more than 3 juvenile steelhead are expected to be injured or killed as a result of relocating the species. No other incidental take is anticipated as a result of the proposed action. The accompanying biological opinion does not anticipate any form of take that is not incidental to the proposed action.

#### 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).

1. Avoid and minimize mortality of steelhead during relocation activities
2. Avoid and minimize adverse effects to steelhead habitat during wet season activities.
3. Prepare and submit a post-construction report regarding the effects of fish relocation and construction activities.

#### 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 or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following term and condition implements reasonable and prudent measure 1:
  - a. Caltrans shall contact NMFS (Jess Fischer, 562-533-6813 or [jessica.fischer@noaa.gov](mailto:jessica.fischer@noaa.gov)) immediately if one or more steelhead are found dead or injured as described in Caltrans’ fish relocation plan.

2. The following term and condition implements reasonable and prudent measure 2:
  - a. If construction at North Ocean Avenue Bridge and Encina Avenue Bridge occur outside of the dry season (June 1 – October 31, 2022) work window and rain is forecasted, Caltrans shall implement additional avoidance measures to prevent construction debris and contaminants from being washed into waterways.
3. The following terms and conditions implement reasonable and prudent measure 3:
  - a. Caltrans shall provide a written report to NMFS by January 15, 2023. The report shall be sent to Jess Fischer, [jessica.fischer@noaa.gov](mailto:jessica.fischer@noaa.gov). The reports shall contain, at a minimum, the following information:
    - i. Construction related activities – The report will include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on steelhead; a description of any and all measures taken to minimize those unanticipated effects and a statement whether the unanticipated effects had any consequence for steelhead; the number of steelhead killed or injured during project construction; and, photographs taken before, during, and after the activity from photo reference points.
    - ii. Fish Relocation – The report will include details as outlined in Caltrans’ fish relocation plan.

## **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 related to the proposed action considered in the biological opinion.

## **2.11 Reinitiation of Consultation**

This concludes formal consultation for the San Luis Obispo County Bridge Preventative Maintenance Program.

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. Other interested users could include the County of San Luis Obispo, California Department of Fish and Wildlife, and U.S. Fish and Wildlife Service. Individual copies of this opinion were provided to Caltrans. The document will be available within two weeks at the NOAA Library Institutional Repository [<https://repository.library.noaa.gov/welcome>]. The format and naming adheres 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 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.

#### 4 References

- Battin, J., M. W. Wiley, M. H. Ruckelshaus, R. N. Palmer, E. Korb, K. K. Bartz, and H. Imaki. 2007. Projected impacts of climate change on salmon habitat restoration. *Proceedings of the national academy of sciences* 104(16):6720-6725.
- Behnke, R. J. 1992. *Native Trout of Western North America* (American Fisheries Society Monograph: No 6). American Fisheries Society, Bethesda, Maryland.
- Boughton, D. A., P. B. Adams, E. C. Anderson, C. Fusaro, E. A. Keller, E. Kelley, L. D. Lentsch, J. L. Nielsen, K. Perry, and H. Regan. 2007. Viability criteria for steelhead of the south-central and southern California coast. NOAA Tech Memo NOAA-TM-NMFS-SWFSC-407.
- Boughton, D. A., P. B. Adams, E. C. Anderson, C. Fusaro, E. A. Keller, E. Kelley, L. D. Lentsch, J. L. Nielsen, K. Perry, H. Regan, J. Smith, C. C. Swift, L. Thompson, and F. G. R. Watson. 2006. Steelhead of the south-central/southern California coast population characterization for recovery planning. NOAA Tech. Memo. NMFS-SWFSC-394.
- Boughton, D. A., and H. Fish. 2003. New data on steelhead distribution in southern and south-central California. National Marine Fisheries Service, Santa Cruz, CA.
- Busby, P. J., T. C. Wainwright, G. J. Bryant, L. J. Lierheimer, R. S. Waples, F. W. Waknitz, and I. V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon, and California. NOAA Tech Memo (NMFS-NWFSC-27).
- Cayan, D. R., E. P. Maurer, M. D. Dettinger, M. Tyree, and K. Hayhoe. 2008. Climate change scenarios for the California region. *Climatic Change* 87(1):21-42.
- Crozier, L. G., R. W. Zabel, and A. F. Hamlet. 2008. Predicting differential effects of climate change at the population level with life-cycle models of spring Chinook salmon. *Global Change Biology* 14(2):236-249.
- Dettinger, M. D., and D. R. Cayan. 1995. Large-scale atmospheric forcing of recent trends toward early snowmelt runoff in California. *Journal of Climate* 8(3):606-623.
- Ebersole, J., W. Liss, and C. Frissell. 2001. Relationship between stream temperature, thermal refugia and rainbow trout *Oncorhynchus mykiss* abundance in arid-land streams in the northwestern United States. *Ecology of freshwater fish* 10(1):1-10.
- Girman, D., and J. C. Garza. 2006. Population structure and ancestry of *O. mykiss* populations in South-Central California based on genetic analysis of microsatellite data. Final Report for California Department of Fish and Game Project No. P0350021 and Pacific States Marine Fisheries Contract No. AWIP-S-1.
- Good, T. P., R. S. Waples, and P. B. Adams. 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. NOAA Tech. Memo. NMFS-NWFSC-66:598 pages.
- Hayhoe, K., D. Cayan, C. B. Field, P. C. Frumhoff, E. P. Maurer, N. L. Miller, S. C. Moser, S. H. Schneider, K. N. Cahill, and E. E. Cleland. 2004. Emissions pathways, climate change, and impacts on California. *Proceedings of the national academy of sciences* 101(34):12422-12427.

- Helmbrecht, S., and D. A. Boughton. 2005. Recent efforts to monitor anadromous *Oncorhynchus* species in the California coastal region: a compilation of metadata. NOAA Tech Memo (NOAA-TM-NMFS-SWFCS-381).
- Intergovernmental Panel on Climate Change (IPCC). 2007. Climate change 2007: the physical science basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC. Cambridge University Press, New York.
- Isaak, D. J., R. F. Thurow, B. E. Rieman, and J. B. Dunham. 2007. Chinook salmon use of spawning patches: relative roles of habitat quality, size, and connectivity. *Ecological Applications* 17(2):352-364.
- Katz, J., P. B. Moyle, R. M. Quiñones, J. Israel, and S. Purdy. 2013. Impending extinction of salmon, steelhead, and trout (Salmonidae) in California. *Environmental Biology of Fishes* 96(10-11):1169-1186.
- Kelly, A. E., and M. L. Goulden. 2008. Rapid shifts in plant distribution with recent climate change. *Proceedings of the national academy of sciences* 105(33):11823-11826.
- McCarty, J. P. 2001. Ecological consequences of recent climate change. *Conservation Biology* 15(2):320-331.
- McElhany, P., M. H. Ruckelshaus, M. J. Ford, T. C. Wainwright, and E. P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. NOAA Tech. Memo. NMFS-NWFSC-42.
- Mote, P. W., E. A. Parson, A. F. Hamlet, W. S. Keeton, D. Lettenmaier, N. Mantua, E. L. Miles, D. W. Peterson, D. L. Peterson, and R. Slaughter. 2003. Preparing for climatic change: the water, salmon, and forests of the Pacific Northwest. *Climatic Change* 61(1-2):45-88.
- NMFS (National Marine Fisheries Service). 1997. Endangered and threatened species: listing of several evolutionary significant units (ESUs) of west coast steelhead. *Federal Register* 62:159(August 18, 1997):43937-43953.
- NMFS (National Marine Fisheries Service). 2005. Endangered and threatened species: designated critical habitat for seven evolutionary significant units of Pacific salmon and steelhead in California. *Federal Register* 70:170(September 2, 2005):52488-52586.
- NMFS (National Marine Fisheries Service). 2006. Endangered and threatened species: Final listing determinations for 10 distinct population segments of west coast steelhead. *Federal Register* 71:3(January 5, 2006):834-862.
- NMFS (National Marine Fisheries Service). 2016. 5-year review: Summary and evaluation of South-Central California coast steelhead distinct population segment. National Marine Fisheries Service, West Coast Region. California Coastal Office. Santa Rosa, California.
- Snyder, M. A., and L. C. Sloan. 2005. Transient future climate over the western United States using a regional climate model. *Earth Interactions* 9(11).
- Spina, A. P. 2007. Thermal ecology of juvenile steelhead in a warm-water environment. *Environmental Biology of Fishes* 80(1):23-34.
- USGCRP (U.S. Global Change Research Program). 2009. Global climate change impacts in the United States: a state of knowledge report from the U.S. global change research program. Cambridge University Press, New York.
- Westerling, A. L., and B. P. Bryant. 2008. Climate change and wildfire in California. *Climatic Change* 87:S231-S249.

- Williams, T. H., S. T. Lindley, B. C. Spence, and D. A. Boughton. 2011. Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Southwest. NOAA's National Marine Fisheries Service, Southwest Fisheries Science Center, Santa Cruz, CA.
- Williams, T. H., B. C. Spence, D. A. Boughton, R. C. Johnson, E. G. R. Crozier, N. J. Mantua, M. R. O'Farrell, and S. T. Lindley. 2016. Viability assessment for Pacific salmon and steelhead listed under the Endangered Species Act: Southwest. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-564.
- Zimmerman, C. E., and G. H. Reeves. 2000. Population structure of sympatric anadromous and nonanadromous *Oncorhynchus mykiss*: evidence from spawning surveys and otolith microchemistry. Canadian Journal of Fisheries and Aquatic Sciences 57(10):2152-2162.
- Zwiers, F. W., and X. Zhang. 2003. Toward regional-scale climate change detection. Journal of Climate 16(5):793-797.