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

APR 2 9 2015

Refer to NMFS No: WCR-2014-1177

Tom Edell
California Department of Transportation, District 5
50 Higuera Street
San Luis Obispo, California 93401-5415

Dear Mr. Edell:

Thank you for your letter of July 14, 2014, requesting initiation of formal consultation with NOAA's National Marine Fisheries Service 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) Floradale Avenue Bridge Replacement Project in the Santa Ynez River, Santa Barbara County (proposed action). Enclosed with this letter is NMFS' biological opinion for the subject proposed action. This biological opinion addresses the effects of the proposed action on the federally endangered Southern California Coast (SCC) Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss*) and its designated critical habitat in accordance with section (7)(a)(2) of the ESA.

The biological opinion concludes that the proposed action is not likely to jeopardize the continued existence of the endangered SCC DPS of steelhead, or destroy or adversely modify designated critical habitat for this species. NMFS believes the proposed action is likely to result in incidental take of endangered steelhead and, therefore, the enclosed incidental take statement includes the amount and extent of anticipated incidental take with reasonable and prudent measures and non-discretionary terms and conditions that are necessary and appropriate to minimize and monitor incidental take of endangered steelhead.

Please contact Jay Ogawa at NMFS' Southern California Branch of the California Coastal Area Office in Long Beach, (562) 980-4061 or at Jay.Ogawa@noaa.gov, if you have a question concerning this section 7 consultation, or if you require additional information.

Sincerely,

for

William W. Stelle, Jr.
Regional Administrator

Enclosure

cc: Administrative File: 151422WCR2014CC00170
Chris Dellith, USFWS, Ventura
Mary Larson, CDFW, Los Alamitos
Eric Shott, NMFS, Santa Rosa

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

Floradale Avenue Bridge Replacement Project
NMFS Consultation Number: WCR-2014-1177

Action Agency: California Department of Transportation

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	Is Action Likely To Jeopardize the Species?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Southern California Coast steelhead (*Oncorhynchus mykiss*)	Endangered	Yes	No	No

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

Issued By: for

William W. Stelle, Jr.
Regional Administrator

Date: APR 2 9 2015

Administrative File: 151422WCR2014CC00170

1. INTRODUCTION

This Introduction 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 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.

A pre-dissemination review of this document was completed using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available through NMFS' Public Consultation Tracking System [https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts]. A complete record of this consultation is on file at NMFS' California Coastal Area Office, Southern California Branch in Long Beach, California.

1.2 Consultation History

On July 14, 2014, NMFS received from the California Department of Transportation's (Caltrans) office in San Luis Obispo, California, a written request for formal consultation under Section 7 of the U. S. Endangered Species Act (ESA). Caltrans' request concerned the Floradale Avenue Bridge Replacement Project (proposed action) at Santa Ynez River, Santa Barbara County. After reviewing Caltrans' request and biological assessment (BA), NMFS determined the information was insufficient to initiate consultation. By letter dated August 7, 2014, NMFS requested additional information and clarification of specific project elements including the water diversion and coffer dam installation, and potential channel response to the proposed action. Upon NMFS' receipt and review of the requested supplemental information on January 12, 2015, formal consultation was initiated on the same day. By letter dated January 29, 2015, NMFS requested further information regarding the proposed habitat-mitigation and monitoring plan (HMMP). On March 9, 2015, NMFS received the requested HMMP.

1.3 Proposed Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR §402.02).

Overview of the Proposed Action: The existing Floradale Avenue Bridge will be replaced with a new five-span bridge (575-feet long x 40-feet wide) and the abutments will be above the ordinary high-water mark. The bridge will be on a new alignment to the west of the existing structure. Rock-slope protection (RSP) will be placed on the northern and southern streambanks to protect the new bridge abutments. Construction of the proposed action is expected to be completed during two seasons with all instream work to occur between June 1 and October 31.

Best-management practices (BMP) are incorporated into the proposed action and will be implemented when bridge-construction activities are undertaken.

Proposed Activities to Prepare the Work Area for Construction: To prepare for construction in dry conditions, the work area will be isolated from surface flow and any steelhead within the affected area will be relocated. A coffer dam will be constructed across the channel immediately upstream of the proposed bridge and remain in place for the duration of each construction season. Surface flow will travel through the work area in a diversion comprised of a 6-meter diameter pipe or temporary channel bordered by sheet piling and return to the creek approximately 450-feet downstream. After the immediate project area is dewatered and all steelhead have been removed and relocated, and the water diversion is functioning as designed, steelhead will be able to volitionally migrate downstream through the action area.

To preclude steelhead from entering the work area prior to the diversion of surface water, a block net will be installed at the upstream and downstream boundary of the work area. Once the block nets are installed the entire work area will be surveyed for steelhead and then relocated to a pre-determined location with suitable habitat. Additional measures will be undertaken to minimize take of steelhead and adverse effects to aquatic habitat during the dewatering process and subsequent construction activities. All proposed water diversion plans will require a qualified fisheries biologist be onsite to monitor installation and removal efforts, in addition to review by NMFS prior to implementation. If pumps are utilized during dewatering, water will be pumped to a settling tank to prevent suspended sediments from being discharged back into the creek. Upon completion of the proposed action and construction activities each season, barriers to surface flow shall be removed the streambed will be restored to pre-construction conditions if altered during construction activities.

Proposed Construction Activities: After the work area is dewatered, Caltrans will begin demolition of the existing bridge, including the removal of fill located on the northern and southern banks. Concrete debris will be removed from the dewatered work area as necessary, and BMPs will be maintained throughout the demolition and construction periods to minimize erosion and sedimentation of the disturbed sections of the work area. These BMPs include, jute-netting, straw-wattles, silt-fencing, and hay bales. After the demolished bridge has been removed, temporary false work will be installed to support the new bridge. Bridge piles and abutments will be installed by the torque and push method to cast-in-steel-shell shafts. A concrete-mixing truck will pour concrete into forms to create the support structures and bridge deck. A layer of RSP will be placed along the abutments and stream banks. Equipment staging will occur outside the riparian corridor in agricultural areas or heavily disturbed land-cover types located to the north and south of the project area.

Proposed Post-Construction Activities: Following construction of the proposed action, Caltrans proposes to implement an HMMP. The plan provides Caltrans' approach for the restoration, enhancement, and replacement of wildlife and aquatic habitat temporarily and permanently lost as a result of the proposed action. To mitigate for a temporary and permanent loss of wildlife and aquatic habitat at a ratio of 5:1, mitigation areas of 2.46 acres of Central Coast willow forest, 0.54 acre of freshwater marsh, and 2.70 acres of coyote brush scrub will be enhanced and revegetated as part of the proposed action. Additionally, in areas where eucalyptus (*Eucalyptus*

sp.) trees can be removed, coast live oak (*Quercus agrifolia*) cuttings will be planted within the project area to mitigate for temporary impacts. Caltrans proposes to implement a 5-year monitoring plan following completion of the proposed action to ensure the biological resources within the action area are restored and enhanced. Monitoring of the revegetated areas will occur for the first three months following completion of the proposed action and then quarterly for years 1 and 2. The mitigation areas will be monitored annually for years 3 to 5.

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). There is no interrelated or interdependent action associated with the proposed action based on NMFS' review of the consultation package.

1.4 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The action area includes the linear extent (upstream and downstream) of the Floradale Avenue Bridge that crosses the Santa Ynez River and encompasses the riparian corridor to the top of bank. The action area extends about 40-feet upstream of the existing bridge centerline where the upper extent of the water diversion will be placed, and 350-feet downstream from the end of the diversion, where temporary construction effects such as elevated turbidity are anticipated to cease. The length of the Santa Ynez River within the action area is about 800-feet.

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, Federal agencies must ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an opinion stating how the agency's actions would affect listed species and their critical habitat. If incidental take is expected, section 7(b)(4) requires NMFS to provide an incidental take statement (ITS) that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures 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 "to jeopardize the continued existence of a listed species," which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR §402.02). The jeopardy analysis considers both survival and recovery of the species.

The adverse modification analysis considers the impacts of the Federal action on the conservation value of designated critical habitat. This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR §402.02. Instead, this biological opinion relies upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.[1]

The following approach is used to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Identify the rangewide status of the species and critical habitat likely to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an "exposure-response-risk" approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors to assess the risk that the proposed action poses to species and critical habitat.
- Reach jeopardy and adverse modification conclusions.
- If necessary, define a reasonable and prudent alternative to the proposed action.

Information submitted by Caltrans and reviewed by NMFS included the following documents: (1) the biological assessment for the proposed action; (2) engineering documents, including bridge alignments and cross-sections; (3) fish passage and equipment specifications; (4) rock-slope protection details; (5) the temporary clear water diversion plan; and (6) the habitat mitigation and monitoring plan. NMFS relied on relevant ecological literature, documented in the official record for the proposed action, to inform the assessment of potential effects on endangered steelhead and designated critical habitat.

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of endangered steelhead, as determined by the level of extinction risk that the listed species faces, 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 informs the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR §402.02.

2.2.1 Status of the Species. – *Oncorhynchus mykiss* is one of six Pacific salmon in the genus *Oncorhynchus* that are native to the North American coast. The natural history of this species dictates the terminology fisheries biologists and resource managers use when discussing *O. mykiss*, its habitat, and distribution. If the species remains in freshwater throughout their entire life cycle (and reside upstream of longstanding migration barriers), they are referred to as resident trout (non-anadromous), or rainbow trout. The anadromous or ocean-going form of *O. mykiss*, and its progeny, are listed under the ESA (NMFS 2006) and is typically referred to as

[1] Memorandum from William T. Hogarth to Regional Administrators, Office of Protected Resources, NMFS (Application of the "Destruction or Adverse Modification" Standard Under Section 7(a)(2) of the Endangered Species Act) (November 7, 2005).

"steelhead." Globally, steelhead are found in the western Pacific through the Kamchatka Peninsula in Asia, east to Alaska, south to southern California, and even reported in Baja California del Norte (Ruiz-Campos and Pister 1995).

The listed unit of anadromous *O. mykiss* is termed a "distinct population segment" or DPS (NMFS 2006), and the listed unit contains several individual or fish-bearing watersheds. The DPS recognizes only the anadromous *O. mykiss*, whereas the term "evolutionarily significant unit," or ESU, refers to both the non-anadromous (or resident) and anadromous (or residualized) *O. mykiss*. In accordance with the listing decision, this biological opinion solely uses the DPS terminology and provides NMFS' conclusion as to the likelihood of jeopardy to the species based only on effects to the listed DPS. This biological opinion analyzes the effects of the proposed action on the following listed DPS and designated critical habitat, which occur in the action area:

Salmonid Species	ESU/DPS Name	Original Listing	Revised Listing(s)	Critical Habitat Designations
Steelhead (*O. mykiss*)	Southern California Coast DPS	FR Notice: 62 FR 43937 Date: 08/18/1997	FR Notice: 71 FR 5248 Date:01/05/2006	FR Notice: 70 FR 52488 Date: 09/02/2005

The geographic range of this DPS extends from the Santa Maria River, near Santa Maria, to the California–Mexico border (NMFS 1997, 2002, 2006), which represents the known southern geographic extent of the anadromous form of *O. mykiss*. NMFS described historical and recent steelhead abundance and distribution for the southern California coast through a population characterization (Boughton *et al.* 2006). Surveys in Boughton *et al.* (2006) indicate between 58 percent and 65 percent of the historical steelhead basins currently harbor *O. mykiss* populations at sites with connectivity to the ocean. Most of the apparent losses of steelhead were noted in the south, including Orange and San Diego counties (Boughton *et al.* 2005). The majority of losses (68 percent) of steelhead were associated with anthropogenic barriers to steelhead migration (*e.g.*, dams, flood-control structures, culverts, etc.). Additionally, the investigators found the barrier exclusions were statistically associated with highly-developed watersheds.

Steelhead in southern California are categorized as "winter run" because they can migrate into natal streams between December and April (Fukushima and Lesh 1998), arriving in reproductive condition and spawning shortly thereafter. Adults may migrate several miles, hundreds of miles in some watersheds, to reach their spawning grounds. Steelhead have evolved to migrate deep into the extreme fringes of a watershed to exploit the environmental conditions that favor production of young (Montgomery *et al.* 1999). Steelhead in southern California streams can be tolerant of warm water, remaining active and feeding at temperatures that are higher than the temperature preferences and heat tolerances reported for the species based on individuals from northern latitudes (Spina 2007). While 46 drainages support this DPS (Boughton *et al.* 2005), only 10 population units possess a high and biologically plausible likelihood of being viable and independent[2] (Boughton *et al.* 2006).

Although the geographic area of the DPS is broad, the individual population units are sparsely

[2] Independent population: a collection of one or more local breeding units whose population dynamics or extinction risk over a 100-year time period is not substantially altered by exchanges of individuals with other populations (Boughton *et al.* 2006).

and distributed throughout the DPS with extensive spatial breadth often existing between nearest-neighbor populations (Boughton *et al.* 2005; NMFS 2005a; Boughton *et al.* 2006). Extinction of some population units has been observed as well as contraction of the southern extent of the species' geographic range (Boughton *et al.* 2005; Gustafson *et al.* 2007). One reason for the extensive spatial gaps between neighboring population units and the range contraction involves man-made barriers to steelhead migration (Boughton *et al.* 2005).

The small number of extant populations that make up this DPS are vulnerable to extirpation due to loss of accessibility to freshwater spawning and rearing habitat, low abundance, degraded estuarine habitats and watershed processes essential to maintain freshwater habitats (NMFS 2011). There is little new evidence to suggest that the status of the SCC DPS has changed appreciably in either direction since publication of the most recent collections of status reviews (Good *et al.* 2005; NMFS 2011; Williams *et al.* 2011). New information since the last review concerning the status of anadromous runs in the DPS is limited and does not suggest a change in extinction risk.

Population abundance trends can vary based on yearly rainfall within the range of the SCC DPS. A relatively large number of adult steelhead were observed in 2008, two years after an extended wet spring that presumably gave smolts ample opportunity to migrate to the ocean. Low rainfall appears to have caused many spawners to get trapped in freshwater, where they were observed during the summer; in addition, low rainfall probably improved conditions for viewing fish during snorkel surveys, and for trapping fish in weirs (Williams *et al.* 2011).

2.2.2 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. Research has shown that juvenile residency can be greatly influenced by the hydrologic cycle in southern California. Extended droughts can cause juveniles to become landlocked, unable to reach the ocean (Boughton *et al.* 2006). These events underscore the importance of stream restoration (*e.g.*, dam removals) in not only mainstem portions of creeks but tributaries as well.

Through studying the otolith (small 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).

2.2.3 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.

2.2.4 Status of Designated Critical Habitat. – Within the process of designating critical habitat, NMFS developed a list of Primary Constituent Elements (PCEs) (NMFS 2005a) for habitat sites essential to support one or more life stages of the DPS, such as sites for spawning, rearing, and migration (Table 1). These sites in turn contain physical or biological features[3] essential to the conservation of the endangered SCC DPS of steelhead.

[3] The essential features include water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, single or complex combination of habitat characteristics, and ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity (per proposed rule: Docket No. FWS–HQ–ES–2012–0096; Docket No. 120106025–3256–01; 4500030114 on May 12, 2014; 50 CFR 424 Vol. 79, No. 91. Page 27066-27077).

Table 1. Physical or biological features which are critical to the conservation of sites determined essential to support one or more life stages of steelhead (NMFS 2005a).

Primary Constituent Elements	Physical Characteristics	Essential to Conservation
Freshwater spawning sites	With water quantity and quality conditions and substrate supporting spawning, incubation and larval development.	Without these features the species cannot successfully spawn and produce offspring.
Freshwater rearing sites	With water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.	Without these features juveniles cannot access and use the areas needed to forage, grow, and develop behaviors (*e.g.,* predator avoidance, competition) that help ensure their survival.
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.	Without these features juveniles cannot use the variety of habitats that allow them to avoid high flows, avoid predators, successfully compete, begin the behavioral and physiological changes needed for life in the ocean, and reach the ocean in a timely manner; allow steelhead adults in a non-feeding condition to successfully swim upstream, avoid predators, and reach spawning areas on limited energy stores.
Estuarine areas	Free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.	Without these features juveniles cannot reach the ocean in a timely manner and use the variety of habitats that allow them to avoid predators, compete successfully, and complete the behavioral and physiological changes needed for life in the ocean; they provide a final source of abundant forage for adult steelhead that will provide the energy stores needed to make the physiological transition to fresh water, migrate upstream, avoid predators, and develop to maturity upon reaching spawning areas.
Near-shore marine areas	Free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.	Without these features juveniles cannot successfully transition from natal streams to offshore marine areas.
Offshore marine areas	With water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.	Without them juveniles cannot forage and grow to adulthood.

Habitat for steelhead has suffered destruction and modification, and anthropogenic activities have reduced the amount of habitat available to steelhead (Nehlsen *et al.* 1991; NMFS 1997; Boughton *et al.* 2005; NMFS 2006). In many watersheds throughout the range of the SCC DPS, the damming of streams has precluded steelhead from hundreds of miles of historical spawning and rearing habitats (*e.g.,* Twitchell Reservoir within the Santa Maria River watershed, Bradbury Dam within the Santa Ynez River watershed, Matilija Dam within the Ventura River watershed, Rindge Dam within the Malibu Creek watershed, Pyramid Dam and Santa Felicia Dam on Piru Creek). These dams create physical barriers and hydrological impediments for adult and juvenile steelhead migrating to and from spawning and rearing habitats. Likewise, construction and ongoing impassable presence of highway projects have rendered habitats inaccessible to adult steelhead (Boughton *et al.* 2005). Within stream reaches that are accessible to this species (but that may currently contain no fish), urbanization (including effects due to water exploitation) has in many watersheds eliminated or dramatically reduced the quality and amount of living space for juvenile steelhead. The number of streams that historically supported steelhead has been dramatically reduced (Good *et al.* 2005). Groundwater pumping and diversion of surface water contribute to the loss of habitat for steelhead, particularly during the dry season (*e.g.*, NMFS 2005b; see also Spina *et al.* 2006). The extensive loss and degradation of habitat is one of the leading causes for the decline of steelhead abundance in southern California and listing of the species as endangered (NMFS 1997, 2006).

A significant amount of estuarine habitat has been lost across the range of the DPS with an average of only 22 percent of the original estuarine habitat remaining (NMFS 2011). The condition of these remaining wetland habitats is largely degraded, with many wetland areas at continued risk of loss or further degradation. Although many historically harmful practices have been halted, much of the historical damage remains to be addressed and the necessary restoration activities will likely require decades. Many of these threats are associated with the larger river systems such as the Santa Maria, Santa Ynez, Ventura, Santa Clara, Los Angeles, San Gabriel, Santa Ana, San Luis Rey, Santa Margarita, San Dieguito, and San Diego rivers, but they also apply to smaller coastal systems such as Malibu, San Juan, and San Mateo creeks. Overall, these threats have remained essentially unchanged for the DPS as determined by the last status review (Williams *et al.* 2011) though some individual, site specific threats have been reduced or eliminated as a result of conservation actions such as the removal of small fish passage barriers.

2.2.5 Influence of a Changing Climate on the Species. – One factor affecting the rangewide status of endangered steelhead, and aquatic habitat at large, is climate change. For the Southwest region (southern Rocky Mountains to the Pacific Coast), the average temperature has already increased roughly 1.5°F compared to a 1960-1979 baseline period. High temperatures will become more common, indicating that southern California steelhead may experience increased thermal stress even though this species has shown to endure higher than preferable body temperatures (Spina 2007).

Precipitation trends are also important to consider. The Southwest region, including California, showed a 16 percent increase in the number of days with very heavy precipitation from 1958 to 2007. Potential impacts to southern California steelhead in freshwater streams include damage to spawning redds and washing away of incubating eggs due to higher winter stream flow (USGCRP 2009), and poor freshwater survival due to longer and warmer periods of drought

(Hanak *et al.* 2011; Mastrandrea and Luers 2012), which may lead to lower host resistance of steelhead to more virulent parasitic and bacterial diseases (McCullough 1999; Marcogliese 2001). Snyder and Sloan (2005) projected mean annual precipitation in southwestern California to decrease by 2.0 cm (four percent) by the end of the 21st century.

Wildfires periodically burn large areas of chaparral and adjacent woodlands in autumn and winter in southern California (Westerling *et al.* 2004). Increased wildfire activity over recent decades reflects sub-regional responses to changes in climate, specifically observations of warmer and earlier onset of spring along with longer summer-dry seasons (Westerling *et al.* 2006; Westerling and Bryant 2008).

Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia *et al.* 2002). Additionally, upper ocean temperature is the primary physical factor influencing the distribution of steelhead in the open ocean, and a warming climate may result in a north-ward shift in steelhead distribution, for example (Myers and Mantua 2013).

In summary, observed and predicted climate-change effects are generally detrimental to the species, given the unprecedented rate of change and uncertainty about the ability to adapt, so unless offset by improvements in other factors, status of the species and critical habitat is likely to decline over time. The climate change projections referenced above cover the time period between the present and approximately 2100. In general, climate change projections cannot be distinguished from annual and decadal climate variability for approximately the first 10 years of the projection period (see Cox and Stephenson 2007). While there is uncertainty associated with projections beyond 10 years, which increases over time, the direction of change is relatively certain (McClure *et al.* 2003).

2.2.6. Status of the Species in the Santa Ynez River Watershed. – The recent presence of steelhead in the mainstem of the Santa Ynez River and several tributaries (*i.e.*, Hilton, Quiota, Alisal, Salsipuedes, and El Jaro Creeks) downstream of Bradbury Dam has been well documented (U.S. Bureau of Reclamation 2011). Various life stages of steelhead, including upstream migrating adults, rearing juveniles, and outmigrating smolts, have been consistently observed at some of these sites, suggesting steelhead continue to persist, albeit greatly reduced from historical levels.

The Santa Ynez River watershed had an estimated adult steelhead return between 20,000 and 30,000 and was one of the largest in southern California (Busby *et al.* 1996). Current adult steelhead returns, while not fully known, are a small fraction (*i.e.,* less than 100 adults total) of historical run sizes (Williams *et al.* 2011). During the winter of 2008, 16 adult steelhead were counted migrating upstream in the Santa Ynez River watershed during trapping and monitoring efforts by the Cachuma Conservation and Release Board (CCRB) (U.S. Bureau of Reclamation 2012). This represents the highest total number of adult steelhead counted in a single year since the monitoring program began in 1993. In most years, the numbers of adult steelhead counted by CCRB are lower.

From 2008 to 2011, CCRB conducted summer juvenile steelhead snorkel surveys within about 6-miles of habitats (*i.e.,* pools, glides, and runs) along the mainstem Santa Ynez River. The number of juvenile steelhead observed during these surveys ranged from about 50 to 100 individuals (U.S. Bureau of Reclamation 2011, 2012, 2013, 2014). Counts from summer snorkel surveys for the same time period along 4-miles of habitats in four tributaries (*i.e.*, Hilton, Quiota, Salsipuedes, and El Jaro creeks) ranged from about 1000 to 3000 juveniles. In 2011, 249 outmigrating smolts were observed by CCRB biologists at three different trap sites (*e.g.,* Hilton Creek, Salsipuedes Creek, and mainstem Santa Ynez River) (U.S. Bureau of Reclamation 2014).

2.3 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR §402.02).

2.3.1 Status of Aquatic Habitat in the Action Area. – Aquatic habitat within the action area of the Santa Ynez River consists of shallow riffles and pools. The low-flow channel in the action area ranges from about 14 to 40-feet wide and is confined by a deposition berm on the southern boundary and an erosional bank on the northern boundary. Riparian vegetation along the stream banks is composed of arroyo willow (*Salix lasioepis*) and sandbar willow (*Salix exigua*), with few large trees that provide canopy cover. The streambed is composed of medium-course sand overlaid with fine sediment. During the summer months, emergent freshwater vegetation provides instream cover within the action area. Freshwater marsh species include southern cattail (*Typha domingensis*), bur-reed (*Sparganium eurycarpum*), alkali bulrush (*Scirpus maritimus*), and yellow waterweed (*Ludwigia peploides*). The river within the action area is perennial, with flows being the lowest during the summer months. Releases of treated water from a wastewater treatment plant about 1-mile upstream from the existing bridge likely maintain surface flow when reaches upstream of the action area are typically dry. At this time we are unaware if the effluent is suitable for growth and survival of steelhead. Overall, the operation of Bradbury Dam has substantially reduced the functional value of the Santa Ynez River for steelhead, including the aquatic habitat within the action area. Alteration of the natural stream flow regime has reduced migration opportunities for adults and juveniles and decreased prospects for establishing and maintaining essential over-summering habitat for juveniles (O'Dowd *et al.* 2014).

2.3.2 Status of Steelhead in the Action Area. – There is no estimate of steelhead abundance within the action area, because only a few surveys have been conducted and no long-term monitoring studies, specific to the action area, have been completed. No steelhead were observed during recent surveys of the action area conducted in the spring and summer of 2013 (Caltrans 2014). In January 2015, CCRB biologists walked the action area and observed no steelhead (S. Engblom, Fish Biologist for CCRB, personal communication February 2015). The surveys were conducted during a period of extended drought when steelhead access throughout the watershed was likely limited and productivity and population size was relatively low. These watershed conditions likely contributed to the lack of steelhead observations in the action area

and the survey results may not be representative of steelhead occurrence in the action area during wetter years. The likelihood for steelhead to be present within the action area may increase during years of higher river flow when there is connectivity throughout the watershed and the potential for increased productivity is higher. Based on habitat conditions (*i.e.*, shallow pools and riffles) in the action area and steelhead densities observed during snorkel surveys of the mainstem Santa Ynez River (U.S. Bureau of Reclamation 2011, 2012, 2013, 2014), NMFS estimates that up to 100 juvenile steelhead may be present in the work area to be dewatered each construction season (or 200 juvenile steelhead total over 2 construction seasons), depending on flow conditions and overall production within the watershed during a given year. Adult steelhead are not expected to be present within the action area during the time of construction activities (June 1 to October 31).

2.3.3 Factors Affecting Species Environment in the Action Area and Vicinity

Agricultural Development

Cultivated fields and open farmlands are located on the south side of the Santa Ynez River within the action area. Agricultural conversions of floodplains are recurring sources of threats to instream habitat. There is potential for increased turbidity or nutrient loading due to runoff from agriculture areas adjacent to the creek. High turbidity concentrations can cause fish mortality, reduce fish feeding efficiency and decrease food availability (Berg and Northcote 1985, McLeavy *et al.* 1987, Gregory and Northcote 1993, Velagic 1995). Agricultural runoff can transfer nutrients and pesticides to the creek, which can in turn lower dissolved oxygen levels by increasing algae growth in streams and decreasing forage for steelhead (Spence *et al.,* 1996).

In addition, demands on groundwater occur from surrounding agricultural activities. The total estimated gross groundwater supply for the Lompoc Plain Groundwater Basin is estimated to be 28,537 AFY with the total estimated range of gross water demand for the basin to be between 32,444 to 34,517 AFY (County of Santa Barbara 2009). Agricultural uses account for 67% to 71% of the gross demand. The extent that water demands may affect the quantity and extent of surface water and essential features of steelhead habitat within the action area is unknown to NMFS. Lowered stream flow or stream drying could result in a significant reduction or loss of habitat and even mortality to steelhead (Spence *et al.,* 1996). These impacts if occurring have the potential to adversely impair steelhead survival within the Santa Ynez River.

Urban Development

There are several urban areas upstream of the action area in the Santa Ynez River watershed (*e.g.*, Santa Ynez, Solvang, and Buellton) as well as urban areas immediately adjacent to the action area (*e.g.*, Federal Correctional Facility, City of Lompoc, and wastewater treatment plant). Urban development of lands often results in an increase of impervious surfaces which can lead to increased runoff of pollutants to surface water. Increased runoff may not be confined to the wet season, but may extend into the dry season due to the washing of streets, parking lots, vehicles, and other elements of the urban environment. Once in surface water, pollutants of sufficient concentration may impair water quality and alter the characteristics of the channel bed. Long-term urbanization effects have been associated with lower fish species diversity and abundance

(Weaver and Garman 1994). Additionally, the input of nitrogen and phosphorus from treated wastewater can lead to increased eutrophication of receiving waters such as rivers and streams (Carey and Migliaccio 2009). Consequently, the proliferation of urban areas within many of the coastal watersheds throughout the Santa Ynez River watershed is of concern.

Water Development

Three major water projects located upstream of the action area capture and store river water within the Santa Ynez River watershed (*e.g.*, Bradbury, Gibraltar, Juncal dams). The development of water resources in the basin have influenced the current habitat characteristics and conditions within the action area. Effects to steelhead and critical habitat from these activities include alteration of the natural pattern and magnitude of flows, and loss and degradation of habitat from regulated flow releases.

O'Dowd *et al.* (2014) identified significant reductions in the frequency, duration, and magnitude of surface flows in the Santa Ynez River downstream of Bradbury Dam, shifts in the timing of peak flows and increased rates of river recession. Annual river hydrographs before the development of major water projects in the basin show river discharge historically (1908-1918) receded to high baseflows during late summer and year-round surface flows were common (*e.g.*, 20 cfs at USGS gage 1113400, Lompoc). After the development of major water resources (1990-2012) river discharge recedes much earlier in the year to considerably lower magnitudes and flowing water is often absent (USGS gage 1113400, Lompoc). In the summer of 2007, water releases from Bradbury Dam were insufficient to maintain surface flows near Alisal Bridge, interrupting stream habitat connectivity which resulted in three steelhead mortalities in a pool near the bridge (Robinson *et al.* 2007). Because the behavior, ecology, and survival of steelhead are directly linked to characteristics of the natural streamflow regime (Richter *et al.* 1996, Richter *et al.,* 1997, Lytle and Poff 2004, NMFS 2012), alterations of the natural streamflow regime have adversely affected this species in a number of ways. These effects include artificial reduction of migration opportunities for adults and juveniles, truncated access into the watershed and chances for spawning, and decreased prospects for establishing and maintaining essential over-summering habitat for juveniles (O'Dowd *et al.* 2014). The reduction in the amount and extent of streamflow are believed responsible for range-wide declines in steelhead abundance (Hedgecock *et al.* 1994, Moyle 1994).

Operation of dams can result in geomorphic changes on downstream habitats that translate into negative impacts on stream fish (Ligon *et al.,* 1995, Kondolf 1997, Trush *et al.,* 2000). These changes can include halting the development of the mid-channel bars, eliminating spawning areas, filling pools with sediment, and channel incision and decreased inundation of the floodplain. With regard to Bradbury Dam, the combined effects of reducing sediment discharge (Willits and Griggs 2003, Slagel and Griggs 2008) and diminished frequency of peak flows disrupt natural reworking of the river channel and floodplain, and led to decreased number and volume of pools and complexity of channel margin and floodplain habitat for endangered steelhead (Harrison 2014).

In addition, the three major water projects (*e.g.*, Bradbury, Gibraltar, and Juncal dams) prevent upstream steelhead passage and thereby reduce opportunities for steelhead to access historical spawning and rearing areas higher in the watershed. As a result, overall steelhead productivity and rearing capacity has been reduced, and thereby decreased the viability of the steelhead population in the Santa Ynez River including the action area.

Mining

A small sand-mining operation is located upstream of the action area near the City of Lompoc. Mining can contribute soil to streams, and cause sedimentation and turbidity, which can be harmful to fish (Cordone and Kelley 1961; Chapman 1988) and their habitat (Alexander and Hansen 1986; Everest *et al.* 1984; Gregory *et al.* 1987). Mining can also cause changes to stream channel morphology by altering the geometry and bed elevation of the channel that could block steelhead migration during periods of low flow (Moulton 1980). These impacts if occurring have the potential to adversely impair steelhead survival within the Santa Ynez River.

Non-Native Species

The introduction of non-native warm water species, including steelhead predators such as largemouth bass (*Micropterus salmoides*) and small mouth bass (*M. dolomieui*) in the Santa Ynez River is of concern (U.S. Bureau of Reclamation 2011). These warm water species including bluegill (*Lepomis macrochirus*) can be found in habitats containing steelhead fry and young of the year and are expected to prey upon them (U.S. Bureau of Reclamation 2011). The precise impacts that non-native species have on the steelhead population within the Santa Ynez watershed is unknown.

2.4 Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR §402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. The expected effects of the action on endangered steelhead and designated critical habitat for this species are described as follows.

2.4.1 Alteration of Aquatic Habitat. – Dewatering the immediate work area is expected to temporarily disrupt steelhead behavior patterns (*i.e.*, rearing, migrating), cause temporary loss of aquatic habitat, as well as loss of invertebrate forage for steelhead within the dewatered work area. About 450-linear feet of the Santa Ynez River will be dewatered 2 times for up to 5-months during the dry season (June 1 through October 31) to allow construction work to proceed in dry conditions. Caltrans proposes the water diversion plan be reviewed by NMFS prior to implementation, however the time allowed for NMFS to review the plan is not described in the proposed action.

Dewatering will temporarily preclude the action area from serving as a freshwater rearing site and a freshwater migration corridor for endangered steelhead. The ability of juvenile steelhead

to migrate upstream through the action area will be hindered for several months while the diversion is in place. Downstream migration of juvenile steelhead from reaches upstream of the action area is not expected to be significantly affected by the diversion since downstream migrants would be able to migrate from upstream to downstream of the action area through the diversion pipes or channel. Adult steelhead are not expected in the river and, therefore, are not likely to be affected by construction activities.

Aquatic macroinvertebrate forage will be temporarily reduced or eliminated within the action area as a result of isolating the workspace from flowing water. Aquatic insects provide a source of food for instream fish populations, and may represent a substantial portion of food items consumed by juvenile steelhead. Effects to aquatic macroinvertebrates resulting from stream flow diversions and dewatering will be temporary because construction activities will be temporary, and rapid recolonization (about one to two months) of the restored channel area by macroinvertebrates is expected following re-watering (Cushman 1985, Thomas 1985, Harvey 1986). In addition, 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. Based on the foregoing, the temporary loss of aquatic macroinvertebrates as a result of dewatering activities is not expected to adversely affect steelhead.

Ultimately, the loss of aquatic habitat associated with dewatering, and the impedance of migration through the action area will be temporary and is not expected to result in lethal effects, as relocated steelhead will be able to use all aquatic habitat downstream of the dewatered portion of the creek, which appears to be of similar quality as the reach subject to dewatering (J.Ogawa, NMFS, 2015, pers. obs.). Connectivity between the upstream and downstream stream reaches will be restored after the water diversion is removed and river flows are returned to the dewatered area, and no long-term diminishment in the physical capacity of the habitat to serve the intended functional role for steelhead will result from the proposed action. Overall, effects to steelhead and designated critical habitat for this species from water diversion are expected to be non-lethal and temporary.

2.4.2 Capture and Relocation of Steelhead. – During the dewatering process in the creek, the water diversion could harm rearing juvenile steelhead by concentrating or stranding them in residual wetted areas before they are relocated and rearing juvenile steelhead could be killed if they become stranded and are not moved out of the diversion area. In addition, steelhead are expected to move to adjacent areas of aquatic habitat during water diversion (Clothier 1953, Clothier 1954, Kraft 1972, Campbell and Scott 1984).

Protocols are proposed to reduce the likelihood of harm and mortality to juvenile steelhead within the area to be dewatered. Biologists will capture and relocate steelhead to the nearest suitable habitat within the creek, though suitable steelhead relocation habitat should be identified prior to installation of the water diversion. Biologists will survey beneath small boulders and areas where juvenile steelhead can hide to the maximum extent practicable in order to relocate steelhead out of the work area. In the event one or more steelhead are missed by the biologists and stranded in the diversion area, steelhead mortality may be observed. Although pumps may be used during dewatering, Caltrans does not propose measures to preclude steelhead from entering the pump system. Caltrans does not identify the number of biologists to be used during

dewatering, specific qualifications and expertise of the biologists, and whether the biologists would be empowered to halt construction activities for the benefit of reducing harm or mortality of steelhead, are not described in the proposed action. Additionally, the proposed action does not include a provision to notify NMFS of the number of steelhead that may be harmed or injured as a result of the construction activities including the dewatering.

Sites selected for relocating juvenile steelhead should have ample habitat, but relocated fish may compete with other fish, potentially increasing competition for available food and habitat (Keeley 2003). Stress from crowding, including increased competition for food among juvenile steelhead in the relocation areas is expected to be temporary, because when the proposed action is finished steelhead will be able to redistribute in the action area. Once the proposed action is completed and the water diversion is removed, living space for juvenile steelhead will return to the dewatered action area.

Based on steelhead survey results in the mainstem Santa Ynez River provided by CCRB (U.S. Bureau of Reclamation 2011, 2012, 2013, 2014), and habitat conditions in the action area, NMFS expects no more than 100 juvenile steelhead will need to be relocated each construction season (no more than 200 juveniles over 2 seasons). NMFS expects that 10 juvenile steelhead may be injured or killed as a result of the proposed action each construction season (no more than 20 juveniles over 2 construction seasons). This estimated mortality is based on NMFS' experience and knowledge gained on similar projects in Santa Barbara County during the last several years. Based on NMFS' general familiarity of steelhead abundance in southern California in general, and Santa Barbara 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 SCC DPS of endangered steelhead. Therefore, the effects of the relocation on steelhead are not expected to give rise to population-level effects.

2.4.3 Disturbance to the Streambed. – Although manipulation and disturbance of the streambed can result in changes to channel morphology and hydraulic conditions that may create impediments to steelhead migration or alter juvenile rearing conditions, review of the proposed action indicates the footprint and alignment of the new bridge are not expected to result in any changes to channel morphology. Removal of the existing bridge including 1.1 acres of pilings and a reduced net pilings footprint of 0.007 acre is expected to promote a more natural and unimpeded flow through the this section of river. As a result steelhead migration conditions through this reach are expected to improve. The existing rearing conditions are expected to remain the same because the proposed grading of the stream bed is expected to retain the existing substrate size, slope and thalweg. Based on these findings, the proposed action is not anticipated to appreciably reduce the functional value of the action areas as sites of freshwater migration or rearing.

2.4.4 Alteration of Water Quality. – Short-term increases in turbidity are anticipated to occur during water diversion and dewatering activities, during the first flush of the stream channel when it is re-watered, and during the first rainstorms which may mobilize disturbed sediments within the action area. This could affect water quality up to 350-feet downstream from the end of the diversion, and is a concern to NMFS because water quality is an important feature of

steelhead critical habitat (NMFS 2005a) and can affect steelhead by a variety of mechanisms. High concentrations of suspended sediment can disrupt normal feeding behavior, reduce feeding efficiency, and decrease food availability (Cordone and Kelly 1961, Bjornn *et al.* 1977, Berg and Northcote 1985). Chronic elevated sedimentation and turbidity can also reduce salmonid growth rates (Crouse *et al.* 1981), increase salmonid plasma cortisol levels (Servizi and Martens 1992), cause salmonid mortality (Cordone and Kelly 1961, Sigler *et al.* 1984), and reduce the survival and emergence of salmonid eggs and fry (Chapman 1988). Even small pulses of turbid water can displace salmonids from established territories to less suitable habitat and increase competition and predation, thereby reducing survival (Waters 1995).

However, NMFS does not expect acute effects on aquatic habitat or steelhead in the Santa Ynez River because increases in sedimentation and turbidity levels resulting from construction activities are expected to be minimal and temporary (*i.e.*, a few hours during dewatering, and a few hours after rewatering to about one day during the first storm). This is because the area where the construction will take place is relatively small and work within the streambed is limited. Also, much of the research mentioned above was carried out in a laboratory setting with turbidity levels significantly higher than those expected to result from project activities. BMPs and sediment control devices (e.g., jute-netting, straw-fiber rolls, silt-fencing, hay bales, and settling basins) should be deployed prior to construction and thus are expected to minimize the effects of sedimentation and turbidity on water quality. The success of these measures has been documented during other similar projects (M. Larson, CDFG, personal communication, 2008), though the efficacy of the proposed measures should be verified in the field at the time of the proposed action. NMFS expects that the disturbance within the stream channel will not result in increased sedimentation within the creek in the long term.

Caltrans proposes precautionary measures to reduce the likelihood that onsite effects would extend downstream; dewatering the work area is expected to greatly advance this objective. However, the operation of heavy equipment is of concern because the proposed action does not appear to include procedures to guard against the minor accidental release of petroleum products into the dewatered channel bed or flowing water, increasing the risk of harm and death for steelhead.

2.4.5 Disturbance to Streamside Vegetation. – Riparian vegetation provides numerous functional values to fish that may benefit migrating, rearing, or spawning steelhead. Riparian vegetation enhances stream habitat by providing shade, cover, and shelter for stream fish in the form of overhanging branches, large-woody debris such as rootwads, undercut banks, and scour pools (Wesche *et al.* 1987, Platts 1991, Wang *et al.* 1997, Bilby and Bisson 1998, Naiman *et al.* 2000). Riparian zones enhance water quality by reducing the input of fine sediments and pollutants into streams (Karr and Schlosser 1978, Lowrance *et al.* 1985). Riparian vegetation also provides a source of drift forage for juvenile steelhead (Wesche *et al.* 1987).

The proposed action has the potential to temporarily affect these elements of aquatic habitat within the action area of the Santa Ynez River due to a loss of some shade and cover where riparian vegetation is currently present along the active channel. Indirect effects associated with the removal of riparian vegetation can result in increased water temperatures (Mitchell 1999, Opperman and Merenlender 2004) and decreased water quality (Lowrance *et al.* 1985, Welsch

1991) attributable to a loss of shade and cover over the active channel. However, the loss of vegetation as a result of the proposed action are expected to be confined to a small localized area and temporary, because riparian vegetation will be replanted throughout the disturbed areas, including additional coast live oak plantings, to minimize impacts from project construction. Based on NMFS' experience observing the response of riparian vegetation to human-made disturbances (M. McGoogan, NMFS 2013, personal communication), the riparian zone is expected to recover from the project 1 to 2 years following the completion of construction. Overall, the amount of riparian vegetation affected by the proposed action is not expected to diminish the overall functional value of the migratory corridor and freshwater rearing sites within the action area. This is expected to be verified through the findings obtained from Caltrans' proposed vegetation-monitoring program under the proposed action.

2.5 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

NMFS is generally familiar with activities occurring in the action area, and at this time is unaware of such actions that would be reasonably certain to occur. Consequently, NMFS believes no cumulative effect, beyond the continuing effects of present land uses as described in the Environmental Baseline (Section 2.3), is likely.

2.6 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5), 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) appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species.

Juvenile steelhead are expected to be present in the action area during the time the proposed action will be implemented and, therefore, subject to direct and indirect effects associated with aspects 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 during dewatering activities, but precautions are in place to minimize, if not eliminate, the risk of injury and mortality, and adjacent instream habitats are expected to suitably harbor the relocated steelhead. Because the habitat alteration due to the dewatering is short lived and localized, the proposed action is not expected to result in adverse modification to designated critical habitat.

Based on the steelhead surveys conducted by CCRB upstream of the action area (U.S. Bureau of Reclamation 2011, 2012, 2013, 2014), NMFS concludes non-lethal take of no more than 100 juvenile steelhead that may be captured and relocated as a result of dewatering within the action area during each construction season (no more than 200 individuals over 2 construction seasons), with a potential lethal take of no more than 10 out of the 100 (total of 20 individuals), thus the risk of mortality is low. Any juvenile steelhead present in the action area likely make up a small proportion of the SCC DPS of steelhead.

Overall, the impacts to critical habitat are expected to be temporary and not translate into a reduction in the functional value of the habitat in the long term. The replanted areas are expected to create a functional riparian zone that provides cover and shelter for steelhead within the action area of the Santa Ynez River. The impacts from disturbing the streambed are not expected to adversely affect the quality or quantity of aquatic habitat; rather, the proposed action is expected to improve steelhead passage conditions within the localized area. Maintained rearing habitat and improved fish passage conditions within the action area of the Santa Ynez River are expected to favor the viability of the endangered SCC DPS of steelhead and not reduce the value of critical habitat for the species.

2.7 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of the endangered SCC DPS of steelhead or destroy or adversely modify its designated critical habitat.

2.8 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and Section 7(o)(2) provide that a 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 incidental take statement.

2.8.1 Amount or Extent of Take

Based on steelhead surveys upstream of the action area, and the depth, size, and amount of instream cover within the action area, the biological opinion anticipates the following amount of incidental take: All steelhead in the action area, expected to be no more than 100 juveniles that are captured or harassed during project activities each construction season (no more than 200

juveniles over 2 seasons). No more than 10 juvenile steelhead are expected to be injured or killed as a result of dewatering the action area and relocating the species each construction season (total of 20 juvenile steelhead). 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.

2.8.2 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.

2.8.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02). NMFS believes following reasonable and prudent measures are necessary and appropriate to minimize and monitor incidental take of steelhead. The results of the effect analysis provide the basis for the following reasonable and prudent measures:

1. Avoid and minimize harm and mortality of steelhead during the relocation activities.

2. Avoid and minimize impacts to steelhead and designated critical habitat from construction activities.

3. Minimize the amount and extent of sediment-related effects on the quality and quantity of instream habitat within the action area.

4. Minimize the amount and extent of temporary and permanent changes in the quality and quantity of living space and riparian habitat for steelhead.

2.8.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and Caltrans or any applicant must comply with the terms and conditions, which implement the reasonable and prudent measures (50 CFR §402.14). Caltrans or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this incidental take statement (50 CFR §402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement reasonable and prudent measure 1:

    A. Caltrans shall retain at least 2 biologists with expertise in the areas of resident or anadromous salmonid biology and ecology, fish/habitat relationships, biological monitoring, and handling, collecting, and retaining salmonid species.

B. Caltrans' biologists shall oversee the construction site during implementation and removal of the water diversion for the purpose of relocating steelhead from the isolated wetted work area to a suitable instream location downstream. One or more of the following methods shall be used to capture steelhead: seine, dip net, throw net, minnow trap, or by hand. Electrofishing is prohibited.

C. Caltrans' biologists shall identify and evaluate the suitability of downstream steelhead relocation habitat(s) prior to undertaking the dewatering activities that are required to isolate the work area from flowing water. The biologists shall evaluate potential relocation sites based on attributes such as adequate water quality (a minimum dissolved oxygen level of 5 mg/L and suitable water temperature), cover (instream and over-hanging vegetation or woody debris), and living space. Multiple relocation habitats may be necessary to prevent overcrowding of a single habitat depending on the number of steelhead captured, current number of steelhead already occupying the relocation habitat(s), and the size of the receiving habitat(s).

D. Caltrans' biological monitor shall provide a written steelhead-relocation report to NMFS within 30 working days following completion of the proposed action. The report shall include the number and size of all steelhead relocated during the proposed action; 2) the date and time of the collection and relocation; 3) a description of any problem encountered during the project or when implementing terms and conditions; and 4) any effect of the proposed action on steelhead that was not previously considered. The report should be sent to Jay Ogawa, NMFS, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802-4213.

E. Caltrans' biologist shall contact NMFS (Jay Ogawa, 562-980-4061) immediately if one or more steelhead are found dead or injured. The purpose of the contact shall be to review the activities resulting in take and to determine if additional protective measures are required. All steelhead mortalities shall be retained, frozen as soon as practical, and placed in an appropriate-sized sealable bag that is labeled with the date and location of the collection and fork length and weight of the specimen(s). Frozen samples shall be retained by the biologist until additional instructions are provided by NMFS. Subsequent notification must also be made in writing to Jay Ogawa, NMFS, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802-4213 within five days of noting dead or injured steelhead. The written notification shall include 1) the date, time, and location of the carcass or injured specimen; 2) a color photograph; 3) cause of injury or death; and 4) name and affiliation of the person whom found the specimen.

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

A. Caltrans shall provide the water diversion plan to NMFS 30 days prior to implementation to allow for NMFS' review. The purpose of NMFS' review is to identify activities that could adversely affect steelhead or their habitat and determine if additional protective measures are required. The water diversion plan shall be sent to Jay Ogawa, NMFS, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802-4213.

B. Pump intakes shall be screened with wire mesh ≤ 5 millimeters to preclude juvenile steelhead from entering the pump system during dewatering.

C. Caltrans' biological monitor shall monitor all construction activities, instream habitat, and performance of sediment-control devices for the purpose of identifying and reconciling any condition that could adversely affect steelhead or their habitat. The biologist shall be empowered to halt work activity and to recommend measures for avoiding adverse effects to steelhead and their habitat. The biological monitor shall immediately contact NMFS (Jay Ogawa, 562-980-4061) upon making a determination that unforeseen effects have occurred, which could have an adverse effect on steelhead or aquatic habitat not previously considered.

D. Heavy equipment shall be positioned away from the creek channel at the end of each workday. When feasible the use of heavy equipment shall be performed from upland areas or the roadway. All heavy equipment shall be checked for leaks of oil, gas, hydraulic fluid and any other pollutant which could impact water quality and instream habitat each workday prior to being deployed into the creek channel. Such leaks shall be controlled for the purpose of avoiding introducing contaminates to surface water or the creek channel.

3. The following term and condition implements reasonable and prudent measure 3:

A. Erosion control or sediment-detention devices (*e.g.* settling tank) shall be installed prior to the time of construction activities and incorporated into Caltrans' maintenance activities. These devices shall be in place during construction activities for the purpose of minimizing sediment and sediment-water slurry input to flowing water. Sediment collected in the devices shall be disposed off-site and not allowed to reenter the creek channel.

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

A. Caltrans or their authorized biologist shall provide a revegetation report that is to include a description of the locations seeded or planted, the area revegetated, proposed methods to monitor and maintain the revegetated area, criteria used to determine the success of the plantings, and pre- and post-planting color photographs of the revegetated area. The revegetation report shall be sent to Jay Ogawa, NMFS, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802-4213, within 30 calendar days following completion of the proposed action.

B. Caltrans or their authorized biologist shall provide the results of the vegetation monitoring within 30 calendar days following completion of each annual site inspection for the 5 years following completion of the project as described in the HMMP. The 5 reports shall include color photographs taken of the project area during each inspection and before implementation of the proposed action. The vegetation monitoring results shall be sent to Jay Ogawa, NMFS, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802-4213.

2.9 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 this biological opinion.

2.10 Reinitiation of Consultation

This concludes formal consultation for Caltrans. As 50 CFR §402.16 states, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

5. 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.

5.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this opinion is Caltrans. Other interested users could include the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service. Individual copies of this opinion were provided to Caltrans. This opinion will be posted on the Public Consultation Tracking System web site (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts). The format and naming adheres to conventional standards for style.

5.2 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.

5.3 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.

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