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

June 3, 2022 **Refer to NMFS No**: WCRO-2022-00641

Connor Ritchie
Associate Environmental Planner / Biologist
California Department of Transportation, District 5
50 Higuera Street
San Luis Obispo, California 93401

Re: Endangered Species Act Section 7(a)(2) Biological for the San Jose Creek Bridge Replacement Project at SR-101 in Santa Barbara County (EA 05-1H430)

Dear Mr. Ritchie:

Thank you for requesting reinitiation 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) SR-101 Bridge Replacement over San Jose Creek. 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 endangered southern California (SC) 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 endangered SC 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 endangered steelhead.

Please contact Jess Fischer at (562) 533-6813 or jessica.fischer@noaa.gov 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: e-file FRN 151422WCR2020CC00088

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response

San Jose Creek Bridge Replacement at SR-101

NMFS Consultation Number: WCRO-2022-00641
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?
Southern California steelhead (*Oncorhynchus mykiss*)	Endangered	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: June 3, 2022

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1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3, below.

1.1. Background

NOAA's National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.), as amended, and implementing regulations at 50 CFR part 402.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within 2 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 March 18, 2022, NMFS received from the California Department of Transportation (Caltrans) a written request for reinitiation of formal consultation under section 7 of the ESA for the San Jose Creek Bridge Replacement at SR-101. 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. Caltrans' written request included the biological assessment and additional information from the original consultation along with a description of changes to the proposed action and effects on endangered steelhead (*Oncorhynchus mykiss*) and designated critical habitat for the species. NMFS issued a biological opinion for the original proposed action on July 31, 2020.

Now, Caltrans proposes to change the duration of the proposed action from two construction seasons to three seasons. Following review of the consultation request, NMFS determined the information received was sufficient and consultation was initiated on March 18, 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 (see 50 CFR 402.02).

1.3.1. Overview of Proposed Action

Caltrans proposes to replace both the northbound and southbound bridges on State Route (SR) 101 (#51-0163R and #51-0163L) over San Jose Creek due to structural deficiencies found in the concrete. Construction will occur during three seasons, with instream construction being confined to June 1 through October 31 of a given year. Best-management practices (BMP) are incorporated into the proposed action and will be implemented when bridge-construction activities are undertaken.

1.3.2. Proposed Activities to Prepare the Work Area for Construction

To prepare for construction in a dry condition, the work area will be temporarily isolated from surface flow if water is present, and any steelhead within the affected area will be relocated each dry season. Caltrans proposes to evaluate steelhead relocation sites based on water quality, cover (instream and over-hanging vegetation or woody debris), and living space. Sites will be chosen to minimize overcrowding, and multiple sites may be necessary based on size and suitability of habitat. After being captured by hand, dip-net, or seine, steelhead will be transported by buckets pre-filled with water at an appropriate temperature to these pre-determined suitable downstream relocation sites. Care will be taken to minimize the amount of time steelhead are held in captivity. Steelhead will be relocated in a manner that does not expose them to temperatures or any other environmental conditions that could cause undue stress or injury. Such conditions to avoid would be sudden changes in water temperatures, prolonged exposure to water that is either too hot or cold, water with low oxygen levels, or overcrowding at the relocation site.

A temporary check-dam will be installed upstream of the SR-101 bridges and connected to two 18-inch diversion pipes. San Jose Creek will be dewatered from the edge of right of way to the north, where the creek intersects with the Calle Real Bridge, to the edge of right-of-way to the south. The southern extent of dewatering would be approximately 85 feet from the southbound bridge, and the northern extent of dewatering would be approximately 103 feet from the northbound bridge. The total dewatered length of San Jose Creek would be approximately 325 feet. Pumps will be screened to remove water from pools after fish are relocated. The diversion pipes and concrete-slope lining will be protected with clean washed gravel wrapped in thick plastic sheeting to cushion the impact of falling concrete. Broken bridge debris will be removed from the streambed, along with the gravel fill, and plastic sheeting. Temporary drainage systems will allow for proper conveyance of surface runoff. To capture water-borne sediment, water will be pumped into a Baker-tank system, then returned to the creek downstream of the construction zone. Access to the creek will be at the departure end of both bridges. Upon completion of instream work, all equipment and any infrastructure associated with dewatering will be removed.

1.3.3. Proposed Construction Activities

Both the northbound and southbound bridges will be replaced with a single span concrete box beam bridge. Cast-in-drill-hole piles will be installed for the abutments; no pile driving will occur. The existing concrete lining of the creek will be replaced with rock-slope-protection (RSP), extending 258 feet on the west bank (26 feet further to the south than existing concrete lining), and 291 feet on the east bank (46 feet further to the south than existing concrete lining). The RSP will transition from existing slope paving upstream and conform to the natural channel downstream of the bridge. The proposed lessened slope of the new channel banks compared to the existing is anticipated to slightly affect the hydrology of the creek. The shallower slopes would extend the banks and increase the cross-sectional area beneath the bridge, which would reduce the flood water elevation at this location. These features would decrease the water surface elevation within the action area, and provide a margin of resilience to potential higher flood flows if future precipitation events become more intense. Caltrans' hydraulic study concluded that there will be no significant impact on the existing floodplain or floodway.

Caltrans provided an updated strategy for staged construction. Beginning April 2023, traffic control measures and vegetation management will be conducted in preparation for in-creek work.

Between June 1 and October 31, 2023, when the creek is dewatered, the northbound bridge will be removed and constructed during this first season. Construction of the northbound bridge involves constructing the abutments, placing pre-cast girders, constructing the bridge deck, and replacing the slope paving with rock slope protection (RSP). After October 31, some minor traffic control activities will take place outside the creek. During the second in-creek work season, the southbound bridge will be removed and constructed similar to the northbound bridge, and raised 1.5 feet to match the elevation of the northbound bridge. During the third season, any remaining concrete slope paving will be replaced with RSP. It is anticipated that work will be completed and the diversion removed during the third season in September.

Removal of portions of the concrete slope lining and installation of RSP would occur during the dry season each year. Creek bed material will be removed and replaced after RSP installation in order to install RSP below grade. Caltrans proposes to implement the following BMP as part of the proposed action:

- Prior to initiation of the stream diversion and dewatering, a qualified biologist shall conduct an informal worker environmental training program including a description of steelhead, its protected status, proximity to the project site, avoidance and minimization measures to be implemented during the project and the implications of violating the ESA as outlined in this biological opinion.
- During in-stream work, a biologist with experience in steelhead biology and ecology, aquatic habitats, biological monitoring, diversion/dewatering, and capturing, handling, and relocating steelhead shall be retained. During in-stream work, the biological monitor shall continuously monitor the placement and removal of any required stream diversions to capture stranded steelhead and relocate them to suitable habitat as appropriate. The biologist shall capture (e.g., dip-net, seine-net, etc.) stranded steelhead and relocate them to suitable in-stream habitat immediately downstream of the work area. The biologist shall note the number of steelhead observed in the affected area, the number of steelhead relocated, and the date and time of the collection and relocation.
- During in-stream work, if pumps are incorporated to assist in temporarily dewatering the site, intakes shall be completely screened with no larger than 0.2-inch (5 mm) wire mesh to prevent steelhead from entering the pump system. Pumps shall release the additional water to a silt filtration bag and/or settling basin allowing the suspended sediment to settle out prior to re-entering the stream outside of the isolated area. The form and function of all pumps used during the dewatering activities shall be checked daily to ensure a dry work environment and minimize adverse effects to steelhead and critical habitat.
- When onsite, the biologist shall evaluate erosion and sediment controls to identify and correct any conditions that could adversely affect steelhead or steelhead habitat. The biologist shall recommend measures to avoid/minimize adverse effects to steelhead and steelhead habitat as needed.
- Dewatering shall be limited to the low-flow period between June 1 and October 31 in any given year, when surface water is likely to be at seasonal minimum. This should avoid adult steelhead spawning migration and peak smolt emigration.
- Vibration and oscillation of piles shall be utilized to the greatest extent feasible to install piles and reduce the need for hammer driving.

1.3.4. Proposed Post-Construction Activities

Following construction of the proposed action, Caltrans proposes to implement a mitigation and monitoring plan (MMP) that includes planting native plant species by the end of the third year of construction. The MMP provides Caltrans' approach for the replacement of riparian habitat temporarily and permanently lost as a result to the proposed action. Caltrans has not yet provided the MMP to NMFS; under the proposed action, the MMP is supposed to stipulate that riparian habitat along channel banks would be replaced at a 1:1 ratio for temporary impacts and a 3:1 ratio for permanent impacts. Caltrans will provide a post-construction report to NMFS containing a summary of the work performed, BMPs implemented, supporting photos, results of species survey and relocation efforts, and details relevant to capture and relocation efforts, though a timeline is not provided.

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would provide for a bike undercrossing to be installed in the future at this location. A consequence is caused by the proposed action if it would not occur but for the proposed action and is reasonable certain to occur. The proposed simple-span structure would allow for the eventual construction of the bike path under the bridge. Details on the bike path are in the County of Santa Barbara Bicycle Master Plan (2016).

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species or to adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS, and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provide an opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion also relies on the regulatory definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR 402.02).

The designation of critical habitat for SC steelhead uses the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision does not change the scope of our analysis, and in this opinion, we use the terms "effects" and "consequences" interchangeably.

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

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their critical habitat using an exposure–response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species; or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the PBFs that are essential for the conservation of the species.

2.2.1. Status of the Species

The endangered southern California (SC) Distinct Population Segment (DPS) of steelhead extends from the Santa Maria River in Santa Barbara County to the Mexican border (inclusive). NMFS characterized the abundance of steelhead in the DPS when the species was originally

listed (August 18, 1997, 62 FR 43937) and cited this information as the basis for the re-listing of the SC DPS of steelhead as endangered (May 3, 2006, 71 FR 834). Estimates of historical (pre-1960s) and more recent (1997) abundance show a precipitous drop in numbers of spawning adults for major rivers in the southern California DPS. An updated status report states that the chief causes for the numerical decline of steelhead in southern California include urbanization, water withdrawals, channelization of creeks, human-made barriers to migration, and the introduction of exotic fishes and riparian plants (Good et al. 2005), and the most recent viability assessments and status reviews indicate these threats are essentially unchanged (NMFS 2011; Williams et al. 2011; NMFS 2016; Williams et al. 2016). Historical data on steelhead numbers for this region are sparse. The historic and recent steelhead abundance estimates, and percent decline are summarized in Table 1. The run-size estimates illustrate the severity of the numerical decline for the major rivers within range of the SC DPS of steelhead (Good et al. 2005; NMFS 2011; Williams et al. 2011; NMFS 2016; Williams et al. 2016).

Stream surveys to document the species' current pattern of occurrence concluded that of the 46 watersheds in the DPS which steelhead occupied historically, *O. mykiss* currently occupy only about 40% to 50% of these watersheds (Boughton et al. 2005). Fish surveys by NOAA's Southwest Fisheries Science Center (SWFSC), direct observations by NMFS biologists, and anecdotal information from local biologists working on major rivers and creeks throughout the DPS suggest that although steelhead populations continue to persist in some coastal watersheds, the population numbers are exceedingly small (Good et al. 2005; Williams et al. 2011; Williams et al. 2016). On a positive note, there have been observations of steelhead recolonizing vacant watersheds during years with abundant rainfall, notably San Mateo Creek and Topanga Creek (Good et al. 2005; Bell et al. 2011) including a recent observation of *O. mykiss* in San Mateo Creek (NMFS 2017). Also, California Department of Fish and Wildlife discovered an adult female steelhead (TL 57.46 cm) on April 26, 2013, during a flow-rate survey in Conejo Creek (Camarillo, California).

NMFS reviews the status and viability of the SC DPS of steelhead on the basis of available information (including new information) about the species abundance, population growth rate, spatial structure, and diversity (McElhany et al. 2000) every five years as required by the ESA. In the last two status reviews, NMFS concluded that the risk of extinction of the endangered SC DPS of steelhead was unchanged (NMFS 2011, 2016).

Table 1. Historical and recent abundance estimates of adult steelhead in the Southern California DPS. Data are from Good et al. (2005); (NMFS 2011), and NMFS SWR redd surveys 2009-2011 (R. Bush, NMFS, personal communication).

	Pre-1950	**Pre-1960**	**1990s**	**2000s**	**Percent Decline**
Santa Ynez River	20,000-30,000		< 100		99
Ventura River		4,000-5,000	< 100	< 100	96
Santa Clara River		7,000-9,000	< 100	< 10	99
Malibu Creek		1,000	< 100		90

2.2.1.1 General Life History of Steelhead

O. mykiss possess 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 area 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 sand and smaller 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

One factor affecting the rangewide status of endangered steelhead, and aquatic habitat at large, is climate change. Within 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 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. 2001; 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. 2004; Westerling and Bryant 2008).

The Thomas Fire impacted SC steelhead viability through direct and indirect effects to PBF mainly in the Ventura River Watershed relative to the Santa Clara River Watershed. The fire burned nearly 80 miles of designated critical habitat. In general, fire impacts include changes in geomorphology (e.g., sediment filled pools and riffles), decreased pool depth, increased solar radiation owing to losses in riparian cover, changes in water quality, increased dissolved nutrients and pH, and changes in pool-riffle ratios (Dunham et al. 2003; Earl and Blinn 2003; Aha et al. 2014). However, these effects may be pronounced or muted depending on the fire burn severity, timing of subsequent rainfalls (e.g., January 9, 2018, storm event), intensity and duration of ensuing rains, and volume of debris and sediment entering streams.

After a fire disturbance, decreased water quality and loss of SC steelhead habitat can be facilitated by the following physical, chemical and biological changes (USFS 2018):

- Increased surface flows resulting in flooding;
- Increased sedimentation leading to changes in food web structure, reducing primary productivity, with effects to grazers and other benthic macroinvertebrates and their predators (e.g., fish);

- Changes to water quality and chemistry due to ash, smoke, nutrients, and hazardous materials;
- Increased water temperature due to reduction/elimination of riparian cover and increased fine sediment loads;
- Scouring of riparian/aquatic vegetation;
- Changes in streambed/pool habitat due to geomorphic movement (debris flows);
- Mass failure of culverts leading to stream habitat degradation;
- Flushing and extirpation of aquatic biota with limited ability to recolonize rivers, including fish, downstream during and after flood events, respectively.

Debris flows are among the most hazardous consequences of rainfall on burned hillslopes (WERT 2018). The January 9, 2018, storm event trigged a debris flow when Matilija Canyon received approximately six inches of rain in 24 hours. This storm event initiated several debris flows within the Santa Ynez Mountains, and consequently inundated areas within Montecito and Carpinteria in Santa Barbara County. The overall peak runoff throughout impacted areas will likely increase relative to unburned areas for the 2-year and 10-year recurrence intervals.

The Thomas Fire affected 11% of total designated critical habitat within the range of the SC DPS of steelhead; burned critical habitat was mainly in the Ventura River Watershed (56%) and to a lesser degree in the Santa Clara River Watershed (18%). Indirect effects from the fire (e.g., mudflow, mudslides) likely increase the extent and amount of habitat destruction downstream to the estuary-ocean interface by altering PBF essential to the conservation of a species including a delay in development of such features, which the species relies upon during various life stages.

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 (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).

2.2.2. Designated Critical Habitat

Critical habitat for the SC 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 (September 2, 2005, 70 FR 52522). PBF are components of stream habitat that have been determined to be essential for the conservation of the SC 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 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 to support growth and development; food and nutrient resources such as terrestrial and aquatic invertebrates and forage fish; 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 and excessive predation with adequate water quantity to allow for juvenile and adult mobility; cover, shelter, and holding areas for juveniles and adults; and adequate water quality to allow for 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.

Streams designated as critical habitat in the SC steelhead DPS contain the above PBF (PBF 1-3) in differing amounts and to varying degrees, depending on the particular stream, the characteristics of the watershed, and the degree that the watersheds are impacted by anthropogenic factors. Perennial streams with PBF and conditions suitable for steelhead are fewer in the southern portion of the DPS compared to the northern portion. Some of this is due to the amount of coastal development and because there is generally less rainfall in the southern region. During the summer many creeks at the southern edge of the range become intermittent in sections or dry completely (in some cases this occurrence is natural and in other cases it is due to anthropogenic factors), and stream temperatures may become a factor in terms of suitability for rearing steelhead. Overall, steelhead over-summering habitat is thought to have a restricted distribution more so than winter spawning and rearing habitat in the SC steelhead DPS (Boughton et al. 2006).

Streams with high conservation value have most or all of the PBF of critical habitat and extensive areas that are suitable for steelhead spawning, rearing, and migration (NMFS 2012). Streams with medium or low conservation value are less suitable for steelhead in terms of spawning, rearing, and migration, and have less of the PBF necessary for steelhead survival growth and reproduction, generally due to anthropogenic factors. Both the Ventura River and Santa Clara River watersheds have been found to have high conservation value for the survival and recovery of the SC DPS of steelhead. While many streams in the DPS have been found to have high conservation value for survival and recovery of the species, the spawning, rearing, and

migratory habitat within the DPS are heavily impacted by dams, diversions, and human development. As a result, much of the available habitat has become severely degraded, and habitat degradation has been a main contributing factor to the current endangered status of the DPS (Good et al. 2005). The most recent status reviews found that these threats have remained essentially unchanged (Williams et al. 2011; NMFS (National Marine Fisheries Service) 2016; Williams et al. 2016).

2.2.2.1 Status of Critical Habitat

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 SC 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 created 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 use) have 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 2005). 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 (Williams et al. 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 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 (NMFS 2016) 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.

Climate-driven changes to stream and estuarine environments have the potential to significantly impact critical habitat for 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 endangered salmonids seeking refuge from unsuitable temperature and streamflow (Crozier et al. 2008).

While continued changes in climate are highly likely, estimating the magnitude of the change is more difficult the further into the future one must go. For example, increases in air temperatures globally are more certain than increases in air temperature in a particular watershed in California. Increases in global air temperatures may shift wind patterns, and these changes, in combination with regional topography, may affect how air temperatures in a particular watershed change in relation to changes in global air temperatures.

Environmental monitoring data in the southwestern United States indicate changes in climatic trends that have the potential to affect steelhead critical habitat. 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 habitat conditions and consequent reductions in *O. mykiss* distribution and abundance in the northwestern United States (Ebersole et al. 2001). Thus, climate variability is an important factor in evaluating how the status of the species and critical habitat is influenced by changing climate.

2.3. Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The proposed action will take place in San Jose Creek which is designated critical habitat for endangered SC steelhead. The action area includes the linear extent (upstream and downstream) of the SR-101 Bridge at San Jose Creek and encompasses the riparian corridor to the top of the bank. The action area extends approximately 103 feet upstream from the existing SR-101 bridges and 500 feet downstream of the diversion where temporary sedimentation effects due to the proposed action ae anticipated to cease. The approximate length of San Jose Creek with in the action area is 825 feet. This section of the creek is expected to be dry during some of the proposed action due to the intermittent nature of the creek.

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).

2.4.1. Status of Steelhead in the Action Area

Juvenile and adult steelhead have been observed throughout San Jose Creek from the 1940s to 2002 (Stoecker and CCP 2002). Within five miles of the action area, the numbers of juvenile steelhead observed ranged from 1 to 100 since the 1990s. Based on the habitat conditions within the action area and steelhead observed in various reports, NMFS estimates that up to 50 juvenile steelhead may be present in the work area to be dewatered each construction season (or 150 juvenile steelhead total over 3 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).

2.4.2. Status of Critical Habitat in the Action Area

Aquatic habitat within the action area of San Jose Creek consists mainly of a concrete lined channel with an incised center channel. There is some vegetation within the riparian corridor just upstream and downstream of the bridge. The creek has intermittent connectivity to the Pacific Ocean, 1.59 miles south of the action area, as the mouth of the Goleta Slough complex periodically closes due to littoral sand transport. Downstream of the SR-101 bridges, the slope lining transitions from smooth concrete to concrete-filled sacks. Within the action area, the concrete-lined channel is approximately 45 feet wide and 12 feet deep. The longitudinal slope of the creek bed is low throughout the project area with an average slope of 0.5% upstream of the bridges and 0.4% downstream (Caltrans 2020). There is no apparent impediment to passage of steelhead within the action area.

2.4.3. Factors Affecting Species Environment in the Action Area and Vicinity

2.4.3.1 Urban Development

San Jose Creek within the action area flows through the County of Santa Barbara near the City of Goleta. Urban development of lands often results in an increase of impervious surfaces which can lead to increased runoff of pollutants to surface water. The location of the SR-101 bridges likely results in road surface runoff, which reduces the water quality within the action area to an unknown degree. The effects on water quality from road surface runoff are most likely occurring during the winter when there is runoff during rainstorms. Runoff from road surfaces contains dirt, oils, automotive fluids, and petrochemicals that are harmful to aquatic life, including steelhead (Spence et al. 1996). 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). Consequently, the proliferation of urban areas within the San Jose Creek watershed is of concern.

2.4.3.2 Channelization and Flood Control Maintenance

Current flood-control activities in lower Goleta Slough have confined the natural floodplain and limited opportunities for riparian communities to become established (Padre Associates 2010). Modification of the stream channel in the lower watershed has affected the amount of available steelhead habitat and the processes that develop and maintain preferred habitat by eliminating floodplain connectivity, limiting instream habitat complexity, and reducing riparian vegetation. Flood-control practices in the action area have disrupted stream sinuosity and inhibited the creeks ability to meander. Impacts to aquatic habitat primarily result from annual flood-control maintenance, which minimizes recruitment of large woody debris, aquatic vegetation, and establishment of a riparian canopy. These impacts result in negative effects to juvenile steelhead growth and survival by reducing new habitat types, limiting recruitment of organic material, and reducing lower food chain production.

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 the water diversion in the work area is expected to temporarily prevent a portion of San Jose Creek from serving as a freshwater migration corridor and freshwater rearing area for endangered steelhead for up to five months during the dry season each year (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. 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 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 aquatic macroinvertebrates as a result of dewatering activities is not expected to adversely affect forage opportunities within the area over the long term.

The temporary loss of habitat due to dewatering activities 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, including freshwater migration areas, has already been diminished and reduced due to anthropogenic factors. Therefore, the loss of habitat due to dewatering represents further loss of habitat. However, the area impacted by the diversion is relatively small compared to the amount and extent of habitat available elsewhere in San Jose Creek and, perhaps more importantly, the diversion will be removed following completion of the proposed action and the creek bed will be restored to pre-project conditions. Freshwater rearing habitats and freshwater migration areas 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 water diversion 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 footprint and alignment of the new bridge and rock slope protection are not expected to result in any substantive 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. 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.

2.5.1.3 Alteration of Water Quality

NMFS does not expect acute or chronic effects on aquatic habitat in San Jose Creek because 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 such as silt fencing, fiber rolls, and barriers. These measures are expected to minimize the effects of sedimentation and turbidity on water quality. Second, the success of these measures has been documented during other similar projects (J. Ogawa, NMFS, 2019, personal communication). NMFS expects that the disturbance on the creek banks will not result in increases in sedimentation or turbidity concentrations that would adversely affect habitat.

2.5.1.4 Disturbance to Streamside Vegetation

The proposed action has the potential to temporarily cause a discrete loss of shade along San Jose Creek. This loss has the potential to translate into increased water temperatures (Mitchell 1999; Opperman and Merenlender 2004) and decreased water quality (Lowrance et al. 1985; 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, according to the proposed action. Based on NMFS' experience observing the response of

riparian vegetation to human-made disturbances (J. Ogawa, NMFS 2019, personal communication), the riparian zone is expected to recover from the project one to two years following the completion of construction. Although Caltrans proposes to monitor replanted areas within the action area following completion of the project, the proposed action does not include a provision to notify NMFS of the success of the proposed plantings over time. Overall, the small amount of riparian vegetation temporarily affected by the proposed action is not expected to diminish the overall functional value of the migratory corridor or rearing habitat within the action area.

2.5.2. Effects of the Action on Endangered Steelhead

The expected effects of the action on endangered steelhead are related to the proposed dewatering in San Jose Creek within the action area to facilitate construction in the dry. Although a general work window is proposed, there is no clear proposed reporting to keep NMFS up to date on actual construction time frames and effects to steelhead. What follows is a discussion of these effects, including discussion of the expected effects due to the proposed capture and relocation of steelhead.

Although dewatering 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 to juvenile steelhead within the isolated area. Prior to dewatering, the workspace will be isolated and biologists will capture and relocate steelhead to the nearest suitable habitat downstream of the work space. 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 colonize the area that had been dewatered. The proposed action includes a description of how suitable relocation sites will be identified.

In the event one or more steelhead are missed by the biologists and stranded in the dewatered area, steelhead mortality is likely. However, Caltrans proposes that qualified biologists will continuously monitor the placement of the diversion and dewatering in order to capture and relocate any stranded steelhead. Although Caltrans will document the capture and relocation of juvenile steelhead within the isolated area, 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 proposed action.

The temporary loss of habitat owing to dewatering could translate into an adverse effect on juvenile steelhead, chiefly through the short-term loss of a freshwater corridor 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 freshwater rearing areas exist in sufficient abundance outside the action area to support displaced juvenile steelhead, without causing overcrowding. In addition, the diversion will contain pipes that will allow steelhead movement between habitats upstream and downstream of the isolated area while water is still present, which appear to be similar quality as the affected area. The diversion would be removed and the site restored to pre-project conditions following completion of the proposed action. Overall, we anticipate the presence of

the water diversion would affect only a small number of steelhead for a relatively short period of time during the dry season, with the effect primarily limited to an increased potential for crowding in neighboring reaches.

The effect of macroinvertebrate loss on juvenile steelhead is expected to be negligible because food from upstream sources would be available downstream of the isolated area via drift. Consequently, the temporary loss of aquatic macroinvertebrates as a result of the presence of the diversion is not expected to adversely affect steelhead

Following construction, hard surfaces provide an avenue for contaminants entering streams with larger amounts of impermeable surfaces leading to a greater accumulation of contaminants. Storm water from roadways and streets has been identified as causing a high percentage of rapid mortality of adult coho in the wild (Scholz et al. 2011) and laboratory settings (McIntyre et al. 2018). Subsequent laboratory studies showed this mortality also occurred in juvenile coho salmon (*O. kisutch*) (Chow, M. et al., 2019) as well as to juvenile steelhead and chinook salmon (J. McIntyre and N. Scholz, unpublished results, 2020). More recent publications have identified a degradation product of tires (6PPD-quinone) as the causal factor in this mortality at concentrations of less than a part per billion (McIntyre et al. 2018; Tian et al. 2021). This contaminant is widely used by multiple tire manufacturers and the tire dust and shreds that produce it have been found to be ubiquitous where both rural and urban roadways drain into waterways (Feist et al. 2011). Fortunately, other recent literature has shown that the mortality can be prevented by infiltrating the road runoff through soil media containing organic matter which results in removal of this (and other) contaminant(s) (McIntyre et al. 2015; Spromberg et al. 2016; Fardel et al. 2020).

Based on steelhead survey results in the vicinity of the action area on San Jose Creek, NMFS expects no more than 50 juvenile steelhead will need to be relocated from the dewatered area each construction season (no more than 150 individuals over three construction seasons). NMFS expects that 5 juvenile steelhead may be injured or killed as a result of the proposed action each construction season (no more than 15 individuals over three 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 SC DPS of endangered 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 only aware of the City of Santa Barbara's Bike Path project that will extend the bike path below the SR-101 bridge at San Jose Creek in the future. The bike path would not be in the creek and is therefore not expected to contribute any additional effects to steelhead or designated critical habitat for the species.

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 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 owing to the dewatering process and related capture and relocation of steelhead. However, 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. The expected effects associated with the habitat alteration due to dewatering 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 50 juvenile steelhead may be captured and relocated each construction season as a result of dewatering the action area (no more than 150 juveniles over three seasons). The potential lethal take is 5 individuals (no more than 15 juveniles over three construction seasons), 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 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 minimal cover for steelhead within the action area of San Jose Creek. Additionally, the MMP will provide mitigation and enhancement of sensitive habitats to mitigate for permanent loss due to the proposed action. The creek will remain channelized with the RSP replacing the concrete slope lining, but any changes in hydraulics would be insignificant. 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 maintain steelhead passage conditions in the localized area. Maintained passage conditions and are expected to favor the viability of the endangered SC 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 warmer 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 would have completely elapsed prior to these climate change effects. The long-term changes in the channel at the bridge site are confined to small areas and are unlikely to significantly magnify the likely climate change impacts.

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 the cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of endangered SC 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, expected to be no more than 50 juveniles that are captured or harassed during project activities each season (no more than 150 individuals over three construction seasons). No more than 5 juvenile steelhead are expected to be injured or killed as a result of dewatering the action area and relocating the species each construction season (no more than 15 individuals over three construction seasons). 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 harm and mortality of steelhead during relocation and dewatering activities;
2. 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 terms and conditions implement reasonable and prudent measure 1:

    a. Caltrans' biologist shall identify and evaluate the suitability of steelhead relocation habitat(s) prior to undertaking dewatering activities to isolate the work area from flowing water. The biologist 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). One or more of the following methods shall be used to capture steelhead: seine, dip net, minnow trap, or by hand.

    b. Captured steelhead will be relocated as soon as possible to an instream location in which suitable habitat conditions are present to allow for adequate survival for transported fish and fish already present. Fish will be distributed between multiple pools if biologists judge that overcrowding may occur in a single pool.

    c. Caltrans shall contact NMFS (Jess Adams, 562-980-4013) 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 Jess Adams, NMFS, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802 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 of the steelhead; 3) cause of injury or death; and 4) name and affiliation of the person whom found the specimen.

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

    a. Caltrans shall provide a written report to NMFS by January 15 of the year following the construction season. The report shall be sent to Jess Fischer, jessica.fischer@noaa.gov. The reports will 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 as to whether or not the unanticipated effects had any effect on 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 (1) 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.

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 recommendation related to the proposed action considered in this biological opinion.

2.11. Reinitiation of Consultation

This concludes formal consultation for the SR-101 Bridge Replacement at Jan Jose Creek. 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 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 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adhere to conventional standards for style.

3.2. Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

3.3. Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR part 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this 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

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