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

SEP 12 2018

Refer to NMFS No: WCR-2018-9534

Randy LaVack
Senior Environmental Planner
Environmental Stewardship Branch
California Department of Transportation, District 5
50 Higuera Street
San Luis Obispo, California 93401

Re: Endangered Species Act Section 7(a)(2) Biological Opinion for the El Camino Real at Santa Margarita Creek Bridge Replacement Project in San Luis Obispo County, California

Dear Mr. LaVack:

Thank you for the California Department of Transportation's (Caltrans)[1] letter of April 30, 2018, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 *et seq.*) for the El Camino Real Bridge Replacement Project in San Luis Obispo County, California.

The enclosed biological opinion is based on our review of Caltrans' proposed project and describes NMFS' analysis of potential effects on South Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*) and designated critical habitat in accordance with section 7 of the ESA. Caltrans proposes to provide funding assistance to the County of San Luis Obispo Public Works Department to replace El Camino Real Bridge and its approaches. In the enclosed biological opinion, NMFS concludes that the project is not likely to jeopardize the continued existence of this species; nor is it likely to adversely modify critical habitat. However, NMFS anticipates that take of S-CCC steelhead may occur. An incidental take statement which applies to this project with non-discretionary terms and conditions is included with the enclosed biological opinion.

We completed pre-dissemination review of this biological opinion 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 biological opinion will be available through NMFS' Public Consultation

[1] Pursuant to 23 USC 327, and through a series of Memorandum of Understandings beginning June 7, 2007, the Federal Highway Administration (FHWA) assigned and Caltrans assumed responsibility for compliance with Section 7 of the federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for federally-funded highway projects in California. Therefore, Caltrans is considered the federal action agency for consultations with NMFS for federally funded projects involving FHWA. Caltrans proposes to administer federal funds for the implementation of the proposed project. Thus, per the aforementioned MOU, Caltrans is considered the federal action agency for this project.

Tracking System [https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts].[2] A complete record of this consultation is on file at the NMFS North-Central Coast Office in Santa Rosa, California.

Please contact Darren Howe at (707) 575-3152 or via e-mail at darren.howe@noaa.gov if you have any questions concerning this section 7 consultation, or if you require additional information.

Sincerely,

for

Barry A. Thom
Regional Administrator

Enclosure

cc: Copy to file ARN 151422WCR2018SR00090
Copy to Chron File

[2] Once on the PCTS homepage, use the following PCTS tracking number within the Quick Search column: WCR-2018-9534.

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion for the El Camino Real at Santa Margarita Creek Bridge Replacement Project

NMFS Consultation Number: WCR-2018-9534

Action Agency: California Department of Transportation (Caltrans)

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?
South-Central California Coast steelhead distinct population segment (DPS) (*O. mykiss*)	Threatened	Yes	No	No

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

Issued By: for

Barry A. Thom
Regional Administrator

Date: SEP 12 2018

1. INTRODUCTION

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

1.1 Background

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

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 through NMFS' Public Consultation Tracking System (PCTS) (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts).[3] A complete record of this consultation is on file at the NMFS North-Central Coast Office in Santa Rosa, California.

1.2 Consultation History

By letter dated April 25, 2018, the California Department of Transportation (Caltrans)[4] requested initiation of formal consultation with NMFS regarding Caltrans' proposed issuance of funding assistance to the County of San Luis Obispo for construction of the El Camino Real at Santa Margarita Creek Bridge Replacement Project. Caltrans' April 25,2018, letter conveyed Caltrans' determination that the proposed project was likely to adversely affect threatened South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*), but was not likely to adversely affect S-CCC steelhead critical habitat. On April 30, 2018, consultation was initiated.

NMFS reviewed the information provided and by email message on June 21, 2018, requested further information regarding project plans, the proposed action, and action area. NMFS received a call on this same June 21, 2018 date from Caltrans personnel informing NMFS that the information request was received, and would be sent to the County of San Luis Obispo (County) so that the County could review the request and provide the information to Caltrans and NMFS. On June 29, 2018, NMFS received from Caltrans, via email, additional information regarding

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[4] Pursuant to 23 USC 327, and through a series of Memorandum of Understandings (MOU) beginning June 7, 2007, the Federal Highway Administration (FHWA) assigned and Caltrans assumed responsibility for compliance with Section 7 of the federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for federally-funded highway projects in California. Therefore, Caltrans is considered the federal action agency for consultations with NMFS for federally funded projects involving FHWA. Caltrans proposes to administer federal funds for the implementation of the proposed project. Thus, per the aforementioned MOU, Caltrans is considered the federal action agency for this project.

project plans, proposed action, and the action area. On August 20, 2018, NMFS and Caltrans received from the County of San Luis Obispo, via email, additional information regarding project design.

1.3 Proposed Federal 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).

Caltrans proposes to provide funding assistance to the County to replace El Camino Real Bridge over Santa Margarita Creek and improve associated roadway approaches in the County of San Luis Obispo, California. The primary purpose of the project is to replace the hydraulically inadequate and deteriorating bridge with one that will conform to current structural and geometric standards improving safety through the corridor. The existing structure is an approximately 81-foot-long and 38-foot-wide (0.071-acre) steel truss bridge that is constructed of a combination of concrete, steel, and metal, and is supported on two abutments (one in each bank) and four in-channel concrete and metal piers. The proposed new bridge will be a cast-in-place (CIP) pre-stressed concrete slab-type bridge approximately 140 feet long and 64 feet wide (0.206 acres), and will be placed at an elevation above the Santa Margarita Creek channel that will ensure flow and debris conveyance beneath the bridge 100-year recurrence interval flow event.

The bridge will have a 100-year design life, and will be supported on a combination of columns, piles, and abutments. Two abutments will be constructed on either side of the creek bank. The abutments will set back approximately 30 feet into each bank, and overlying fill will be partially removed (laid back), resulting in a channel width that will be approximately 59 feet wider at the top of bank than the existing channel width. These abutments will be supported on two subsurface cast-in-drilled-hole (CIDH) piles measuring 2 feet in diameter. The remaining structural components consist of two sets of seven, 2-foot-diameter columns (one column set placed along both banks). Columns will be placed in a line, with each of the seven columns in a set placed approximately 6 feet from the bank, and spaced approximately 8 – 10 feet apart. Each column will be supported on a subsurface CIDH pile measuring 4 feet in diameter. To prevent erosion of the streambanks, ungrouted rock slope protection (RSP) will be placed on the banks. The RSP will cover an area of approximately 0.183 acres and will be backfilled with native soils and planted with willows obtained from on-site. Final construction of the new bridge will decrease the amount of in-channel structure by approximately 0.001 acres.

Implementation of the project will occur in two phases to maintain traffic flow, and will occur over two construction seasons. During phase one, a portion of the existing bridge will be demolished and a new portion of the bridge will be constructed adjacent to the existing portion. One of the associated road approaches will also be constructed during this phase. During phase two, the same series of activities will occur on the opposite side after traffic is shifted to the newly constructed portion of the bridge. Access to the creek channel will be needed to install temporary falsework, CIDH piles, and to remove the existing bridge. While instream work will be conducted during the dry season when flows will be at annual lows, four isolated plunge pools that retain perennial water will be dewatered. This will require dewatering approximately 120

feet of Santa Margarita Creek. To gain access, water from the creek will be temporarily diverted through or around the work area utilizing a combination of methods (e.g., cofferdams, pipes, and berms), and a temporary access path will be constructed on the north bank down into the creek channel. Instream construction is scheduled to occur between June 15 and October 15 of 2020 and 2021. The dewatering systems will be removed at the end of the first construction season and reinstalled at the beginning of the second construction season.

If present in the plunge pools, threatened S-CCC steelhead will be collected and relocated prior to dewatering the work site. The project includes avoidance and minimization measures that will be implemented before, during, and after construction to prevent and minimize project-related effects to S-CCC steelhead, and their habitat. These include measures to: ensure proper handling and relocation of S-CCC steelhead during dewatering; limit the instream work window and extent of work area; implement erosion control best management practices (BMPs), including installing soil stabilizing geotextiles and native vegetation; ensure the complete removal and proper disposal of all construction materials and waste; and monitoring and reporting to ensure implementation of BMPs and establishment of native vegetation. A more detailed description of these measures can be found in the Habitat Mitigation and Monitoring Plan (SWCA Consulting 2017), Fish Handling and Relocation Plan (San Luis Obispo County 2018), and the El Camino Real Bridge Replacement Project Biological Assessment (Caltrans 2018).

"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). NMFS does not anticipate any interrelated or interdependent actions associated with the proposed action.

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

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

2.1 Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "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). Therefore, 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 relies on the definition of "destruction or adverse modification", which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species". Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (50 CFR 402.02).

We use the following approach 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 expected 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 by: (1) Reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.
- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- If necessary, suggest a Reasonable and Prudent Alternative to the proposed action.

For critical habitat, NMFS determines the range-wide status of critical habitat by examining the condition of its physical or biological features (also called "primary constituent elements" or PCEs) - which were identified when critical habitat was designated. The new critical habitat regulations (81 FR 7214, Feb. 11, 2016, codified at 50 CFR 402.02) replace 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 primary constituent elements, physical or biological features, 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. Species and critical habitat status are discussed in section 2.2 Rangewide Status of the Species and Critical Habitat.

To conduct the assessment, NMFS examined an extensive amount of information from a variety of sources. Detailed background information on the biology and status of listed species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. Additional information regarding the effects of the project's actions on the listed species in question, their anticipated response to these actions, and the environmental consequences of the

actions as a whole was formulated from the aforementioned resources referenced in the Consultation History section. For information that has been taken directly from published, citable documents, those citations have been referenced in the text and listed at the end of this document.

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of S-CCC steelhead, likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that S-CCC steelhead 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' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

2.2.1 Species Description, Life History, and Status

This biological opinion analyzes the effects of the federal action on the following Federally-listed species Distinct Population Segment (DPS) and designated critical habitat:

S-CCC steelhead DPS
Threatened (January 5, 2006; 71 FR 834)
Critical habitat (September 2, 2005; 70 FR 52488).

The S-CCC steelhead DPS includes all naturally spawned steelhead populations in streams from the Pajaro River watershed (inclusive) to, but not including, the Santa Maria River, (71 FR 834) in northern Santa Barbara County, California. There are no artificially propagated steelhead stocks within the range of the S-CCC steelhead DPS.

2.2.1.1 S-CCC Steelhead General Life History

Steelhead are anadromous fish, spending time in both fresh- and saltwater. Steelhead possess a complex life history requiring successful completion and transition through various life stages in marine and freshwater environments (e.g., spawning and outmigration, egg-to-fry emergence, juvenile rearing, smolt outmigration and ocean survival). Spawning typically occurs during the winter and spring, smolt emigration typically occurs late winter through spring, and rearing of juveniles may take place throughout the year if sufficient rainfall provides adequate streamflow and habitat in the summer months. Eggs (laid in gravel nests called redds), alevins (gravel dwelling hatchlings), fry (juveniles newly emerged from stream gravels), and young juveniles all rear in freshwater until they become large enough to migrate to the ocean to finish rearing and maturing to adults. Eggs incubate and emerge in about three weeks (depending on water temperature), and the alevins remain in small spaces between gravels before entering the stream water column. Although variation occurs in coastal California, juveniles usually spend one to

two years in freshwater, then smolt and emigrate to the ocean, using an estuary for acclimation to saltwater and as a migration corridor. They usually spend one to three years in the ocean (usually two years in the Pacific Southwest) (Barnhart 1986), where they mature into adults before returning to their natal stream to spawn.

Steelhead fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Shirvell 1990; Meehan and Bjorn 1991). Steelhead, however, tend to use riffles and other habitats not typically associated with instream cover during summer rearing more than other salmonids. Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. Rearing steelhead juveniles prefer water temperatures of 7-14˚ C (Barnhart 1986; Bjornn and Reiser 1991). They can survive in water up to 27˚ C with saturated dissolved oxygen (DO) conditions and a plentiful food supply. Fluctuating diurnal water temperatures also aid in survivability of salmonids (Busby *et al.* 1996).

Although variation occurs in coastal California, juveniles usually spend one to two years in freshwater, then smolt and migrate to the ocean, using an estuary for acclimation to saltwater and as a migration corridor. They usually spend one to three years in the ocean (usually two years in the Pacific southwest) (Barnhart 1986), where they mature into adults before returning to their natal stream to spawn. Steelhead may spawn one to four times over their life. The maximum lifespan of a steelhead is approximately nine years (Moyle 2002).

2.2.1.2 Status of S-CCC Steelhead DPS

In this opinion, NMFS assesses four population viability parameters to help us understand the status of S-CCC steelhead DPS and the population's ability to survive and recover. These population viability parameters are: abundance, population growth rate, spatial structure, and diversity (McElhany *et al.* 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information to determine the general condition of the S-CCC steelhead DPS and factors responsible for the current status of S-CCC steelhead DPS.

We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20). For example, the first three parameters are used as surrogates for numbers, reproduction, and distribution. We relate the fourth parameter, diversity, to all three regulatory criteria. Numbers, reproduction, and distribution are all affected when genetic or life history variability is lost or constrained, resulting in reduced population resilience to environmental variation at local or landscape-level scales.

Populations of S-CCC steelhead throughout the DPS have exhibited a long-term negative trend since the mid-1960s. In the mid-1960s, total spawning populations were estimated at 17,750 individuals (Good *et al.* 2005). Available information shows S-CCC steelhead population abundance continued to decline from the 1970s to the 1990s (Busby *et al.* 1996) and more recent data indicate this trend continues (Good *et al.* 2005). Current S-CCC steelhead run-sizes in the

five largest systems in the DPS (Pajaro River, Salinas River, Carmel River, Little Sur River, and Big Sur River) are likely greatly reduced from 4,750 adults in 1965 (CDFG 1965) to less than 500 returning adult fish in 1996. More recent estimates for total run-size do not exist for the S-CCC steelhead DPS (Good *et al.* 2005).

Analyses conducted by NMFS (Boughton *et al.* 2006; Boughton *et al.* 2007; Williams *et al.* 2011; Williams *et al.* 2016) indicate the S-CCC steelhead DPS consists of 12 discrete sub-populations which represent localized groups of interbreeding individuals, and none of these sub-populations currently meet the definition of viable. Most of these sub-populations can be characterized by low population abundance, variable or negative population growth rates, and reduced spatial structure and diversity. The sub-populations in the Pajaro River and Salinas River watersheds are in particularly poor condition (relative to watershed size) and exhibit a greater lack of viability than many of the coastal subpopulations.

Although steelhead are present in most streams in the S-CCC DPS (Good *et al.* 2005), their populations are small, fragmented, unstable, and vulnerable to stochastic events (Boughton *et al.* 2006). In addition, severe habitat degradation and the compromised genetic integrity of some populations pose a serious risk to the survival and recovery of the S-CCC steelhead DPS (Good *et al.* 2005). NMFS' 2005 status review concluded S-CCC steelhead remain "likely to become endangered in the foreseeable future" (Good *et al.* 2005). NMFS confirmed the listing of S-CCC steelhead as threatened under the ESA on January 5, 2006 (71 FR 834).

Further detailed information on this steelhead DPS is available in NMFS' Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California (Busby *et al.* 1996), NMFS' final rule for listing steelhead (62 FR 43937), and NMFS' recovery plan (NMFS 2013). Additional information is available from the NMFS Southwest Fisheries Science Center (SWFSC). The SWFSC has prepared several reports specifically for recovery planning that provide: 1) characterization of the S-CCC steelhead DPS historical population structure; 2) viability criteria for recovery; 3) assessment of threats; and 4) recommendations for recovery of the highest priority populations (Boughton and Goslin 2006; Boughton *et al.* 2006; Boughton *et al.* 2007). The two most recent status updates conclude that steelhead in the S-CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (NMFS 2011; NMFS 2016; Williams *et al.* 2011; Williams *et al.* 2016), as new and additional information available since Good *et al.* (2005) does not appear to suggest a change in extinction risk. On December 7, 2011, and again on May 26, 2016, NMFS chose to maintain the threatened status of the S-CCC steelhead DPS (76 FR 76386 ; 81 FR 33468).

2.2.1.3 Status of S-CCC Steelhead Critical Habitat

In designating critical habitat, NMFS considers the following requirements of the species: 1) space for individual and population growth, and for normal behavior; 2) food, water, air, light, minerals, or other nutritional or physiological requirements; 3) cover or shelter; 4) sites for spawning, reproduction, and rearing offspring; and, generally; and 5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on known PBFs

within the designated area that are essential to the conservation of the species and that may require special management considerations or protection. For S-CCC steelhead, PBFs include (70 FR 52488):

1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development. These features are essential to conservation because without them the species cannot successfully spawn and produce offspring.

2) 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, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. These features are essential to conservation because without them, juveniles cannot access and use the areas needed to forage, grow, and develop behaviors (e.g., predator avoidance, competition) that help ensure their survival.

3) Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival. These features are essential to conservation because without them 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. Similarly, these features are essential for adults because they allow fish in a non-feeding condition to successfully swim upstream, avoid predators, and reach spawning areas on limited energy stores.

4) 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. These features are essential to conservation because without them 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. Similarly, these features are essential to the conservation of adults because they provide a final source of abundant forage 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.

For the S-CCC steelhead DPS, approximately 1,832 miles of stream habitat, and 442 square miles of estuarine habitat are designated critical habitat (70 FR 52488). Critical habitat for the DPS has been designated in the following CALWATER Hydrologic Units: Pajaro River, Carmel River, Santa Lucia, Salinas, and Estero Bay. Tributaries in the Neponset, Soledad, and Upper Salinas Valley Hydrologic Sub-areas (HSA) were excluded from critical habitat and Department of Defense lands in the Paso Robles and Chorro HSAs were excluded.

The coastal drainages used by the S-CCC steelhead DPS provide relatively higher amounts of the freshwater rearing PBFs, maintain connectivity, and result in a wider distribution of the species in these drainages than in inland drainages. Inland drainages provide important freshwater migration, freshwater spawning, and freshwater rearing PBFs unique within the inland ecotype. However, most areas of critical habitat in both coastal and inland drainages have been degraded compared to conditions that once supported thriving populations of steelhead.

2.2.2 Factors Responsible for the Decline of S-CCC Steelhead DPS and Degradation of S-CCC Critical Habitat

Of the watersheds in the S-CCC steelhead DPS historically supporting steelhead, most continue to support steelhead, although population sizes are significantly reduced or no longer exist in many sub-watersheds. A reduced population size causes each individual within the population to be more important and significantly increases the population's susceptibility to small or catastrophic events. Moreover, low population sizes compromise genetic integrity, posing serious risks to steelhead survival and recovery. The four largest watersheds (Pajaro, Salinas, Nacimiento/Arroyo Seco, and Carmel rivers) have experienced declines in run sizes of 90 percent or more, and steelhead are extirpated from many of their subwatersheds primarily due to anthropogenic and environmental influences. Steelhead in this DPS have declined in large part as a result of anthropogenic influences associated with agriculture, mining, and urbanization activities that have resulted in the loss, degradation, simplification, and fragmentation of habitat (Hunt and Associates Biological Consulting Services 2008), and to some degree disease and predation.

2.2.2.1 Habitat Alteration

Habitat destruction and fragmentation have been linked to increased rates of species extinction over recent decades (Davies *et al.* 2001). A major cause of the decline of steelhead is the loss or decrease in quality and function of PBFs. Most of this loss and degradation of habitat, including critical habitat, has resulted from anthropogenic watershed disturbances caused by water diversions, the influences of large dams, agricultural practices (including irrigation), ranching, recreation, urbanization, loss of estuarine habitat and wetland and riparian areas, roads, grazing, gravel mining, and logging. While individual components of this list of factors affecting steelhead and critical habitat have fluctuated in severity over the last 100 years, the general trend has been one of increasing and intractable pressure on aquatic resources. These factors have significantly altered steelhead habitat quantity and quality. Associated impacts of these factors include: alteration of stream bank and channel morphology; alteration of ambient stream water temperatures; degradation of water quality; elimination of spawning and rearing habitats; fragmentation of available habitats; elimination of downstream recruitment of spawning gravels and large woody debris (LWD); removal of riparian vegetation resulting in increased stream bank erosion; and increased sedimentation input into spawning and rearing areas resulting in the loss of channel complexity, pool habitat, suitable gravel substrate, and LWD.

2.2.2.2 Water Use

Water storage, withdrawal, conveyance, and diversions for agriculture, flood control, domestic, and hydropower purposes have greatly reduced or eliminated historically accessible habitat. Modification of natural flow regimes by dams and other water control structures have resulted in increased water temperatures, changes in fish community structures, depleted flow necessary for migration, spawning, rearing, flushing of sediments from spawning gravels, and reduced gravel recruitment. The substantial increase of impermeable surfaces as a result of urbanization (including roads) has also altered the natural flow regimes of rivers and streams, particularly in lower reaches. Depletion and storage of natural flows have altered natural hydrological cycles in many California rivers and streams in general, including streams providing habitat to the S-CCC steelhead DPS in particular. Alteration of stream flows has increased juvenile salmonid mortality for a variety of reasons including: impaired migration from insufficient flows or habitat blockages; loss of rearing habitat due to dewatering and blockage; stranding of fish resulting from rapid flow fluctuations; entrainment of juveniles into unscreened or poorly screened diversions; and increased juvenile mortality resulting from increased water temperatures (Chapman and Bjornn 1969; Berggren and Filardo 1993; 61 FR 56138). However, the greatest threats to the S-CCC steelhead DPS population are the degradation of habitats and loss of habitat by impassable dams. The SWFSC has identified re-establishing access to upper watersheds in the Pajaro and Salinas watersheds as one of the highest priorities for the recovery of the S-CCC steelhead DPS (Boughton *et al.* 2006; Boughton *et al.* 2007).

2.2.2.3 Estuarine Habitat Loss

A significant percentage of estuarine habitats have been lost, particularly in the northern and southern portions of the S-CCC steelhead DPS where the majority of the wetland habitat historically occurred. 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 the land use activities described above have resulted in the loss of wetlands and degradation of estuaries in the larger river systems such as the Pajaro, Salinas, Carmel and Arroyo Grande rivers, and many also apply to the smaller coastal systems such as Morro, San Luis Obispo, and Pismo Creeks (NMFS 2011).

2.2.2.4.*Fishing Harvest*

Steelhead populations traditionally supported an important recreational fishery throughout their range and likely increased the mortality of adults and juveniles. There are few good historical accounts of the abundance of steelhead harvested along the California coast (Jensen and Swartzell 1967). However, Shapovalov and Taft (1954) report that very few steelhead were caught by commercial salmon trollers at sea but considerable numbers were taken by sports anglers in Monterey Bay. There are also many anecdotal reports of recreational fishing and poaching of instream adults (Franklin 2005) which suggests a relatively high level of fishing pressure. Although such impacts may have contributed to the decline of some naturally small populations, NMFS does not consider it to be a principal cause for the decline of the S-CCC steelhead DPS (NMFS 2011). Some recreational angling for *O. mykiss* continues to be allowed in

all coastal drainages in its range and also continues to occur in areas above currently impassible barriers. CDFW also restricts angling on streams accessible to anadromous fish through their angling regulations, which includes daily restrictions and limited catch numbers along with catch-and-release fishing. This may relieve some of the negative pressures associated with angling on the population, however, it should be noted that even catch-and-release fishing can have adverse effects on listed fish. During periods of decreased habitat availability (e.g., drought conditions or summer low flow when fish are concentrated in freshwater habitats); the impacts of recreational fishing or harassment on native anadromous stocks can increase (NMFS 2011).

Ocean harvest of steelhead is considered to be extremely rare and is an insignificant source of mortality for this DPS since both sport and commercial harvest of steelhead in the ocean is prohibited by CDFW (CDFG 2010). Although high seas driftnet practices in the past likely resulted in incidental harvest of steelhead, the occurrence of this is thought to be limited to some local areas as steelhead are not a commercially targeted species (NMFS 2011).

2.2.2.5 Atificial Propagation

There are no steelhead hatcheries operating in or supplying hatchery reared steelhead to the DPS. However, there is an extensive stocking program of hatchery cultured and reared, non-anadromous *O. mykiss* which supports a put-and-take fishery that is stocked for removal by anglers. These stockings are now generally conducted in non-anadromous waters (though other non-native game species such as smallmouth bass (*Micropterus dolomieui*) and bullhead catfish (*Ameiurus* sp.) are stocked into anadromous waters by a variety of public and private entities). Nevertheless, hatchery origin non-anadromous fish may enter anadromous waters as a result of spillage over dams. Although these stockings are generally carried out in waters which do not support anadromous populations, the potential does exist for fish to escape into anadromous waters.

While some of these programs have succeeded in providing seasonal fishing opportunities, the impacts of these programs on native, naturally-reproducing steelhead stocks are not well understood. Competition, genetic introgression and disease transmission resulting from hatchery introductions could reduce the production and survival of native, naturally-reproducing steelhead (Araki *et al.* 2007; Araki *et al.* 2008; Araki *et al.* 2009); although, genetic research on southern California steelhead has not detected any substantial interbreeding of native steelhead with hatchery reared steelhead (Girman and Garza 2006; Garza and Clemento 2007; Clemento *et al.* 2008; Abadia-Cardoso *et al.* 2011; Christie *et al.* 2011). Additionally, collection of native steelhead for hatchery broodstock purposes can also harm small or dwindling natural populations. However, artificial propagation, if done to preserve individuals representing genetic resources that would otherwise be lost, or done to aid wild fish repopulation of streams, may also play an influential role in steelhead recovery. Such efforts can supplement, but are not a substitute for naturally-reproducing populations.

2.2.2.6 Environmental Factors

Variability in natural environmental conditions has both masked and exacerbated the problems associated with degraded and altered riverine and estuarine habitats. Floods and persistent

drought conditions have periodically reduced naturally limited spawning, rearing, and migration habitats. Furthermore, El Nino events and periods of unfavorable ocean-climate conditions can threaten the survival of steelhead populations already reduced to low abundance levels due to the loss and degradation of freshwater and estuarine habitats. However, periods of favorable ocean productivity and high marine survival can temporarily offset poor habitat conditions elsewhere and result in dramatic increases in population abundance and productivity by increasing the size and correlated fecundity of returning adults (NMFS 2011). The threats from projected climate change are likely to exacerbate the effects of environmental variability on steelhead and its habitat in the future. Thus, increased environmental variability resulting from projected climate change is now recognized as a new and more serious factor that may threaten the recovery of the S-CCC steelhead DPS (NMFS 2011).

2.2.2.7 Ocean Conditions

Variability in ocean productivity has been shown to affect salmon production both positively and negatively. Beamish and Bouillion (1993) showed a strong correlation between North Pacific salmon production and marine environmental factors from 1925 to 1989. Beamish *et al.* (1997) noted decadal-scale changes in the production of Fraser River sockeye salmon that they attributed to changes in the productivity of the marine environment. They also reported the dramatic change in marine conditions occurring in 1976-77 (an El Niño year), when an oceanic warming trend began. These El Niño conditions, which occur every three to five years, negatively affect ocean productivity. For instance, Johnson (1988) noted increased adult mortality and decreased average size for Oregon Chinook salmon (*O. tshawytscha*) and coho salmon (*O. kisutch*) during the strong 1982-83 El Niño. Brood years of salmon and steelhead that were in the ocean during the 1983 El Niño event exhibited poor survival all along the Pacific coast of California (Garrison *et al.* 1994). Salmon populations have persisted over time, under pristine habitat conditions, through many cycles of poor ocean survival in the past. It is less certain how they will fare in periods of poor ocean survival when their freshwater, estuary, and nearshore marine habitats are degraded (Good *et al.* 2005).

2.2.2.8 Reduced Marine-Derived Nutrient Transport

Salmonids may play a critical role in sustaining the quality of habitats essential to the survival of their own species via the transfer of marine-derived nutrients (MDN) to freshwater systems. MDN are nutrients that accumulate in the bodies of salmonids while they are in the ocean and are then left in freshwater streams when salmonids die after spawning. Salmon carcasses decay or are eaten, transferring these nutrients from the ocean to watersheds. MDN has been shown to be vital for the growth of juvenile salmonids (Bilby *et al.* 1996; Bilby *et al.* 1998). The return of salmonids to rivers makes a significant contribution to the flora and fauna of both terrestrial and riverine ecosystems (Gresh *et al.* 2000).

Reduction of MDN in watersheds is a consequence of the past century of decline in salmon abundance (Gresh *et al.* 2000). Evidence of the role of MDN and energy in ecosystems suggests this deficit may result in an ecosystem failure contributing to the downward spiral of salmonid abundance (Bilby *et al.* 1996). The loss of this nutrient source may perpetuate salmonid declines in an increasing synergistic fashion.

2.2.2.9 Disease and Predation

Infectious disease is one of many factors that can influence adult and juvenile steelhead survival. Specific diseases such as bacterial kidney disease, Ceratomyxosis, Columnaris, Furunculosis, infectious hematopoietic necrosis, redmouth and black spot disease, Erythrocytic Inclusion Body Syndrome, and whirling disease among others are present and are known to affect steelhead and salmon. Very little current or historical information exists to quantify changes in infection levels and mortality rates attributable to these diseases for steelhead. Warm water temperatures, in some cases can contribute to the spread of infectious diseases. However, studies have shown that native fish tend to be less susceptible to pathogens than hatchery cultured and reared fish (Buchanan *et al.* 1983).

Introductions of non-native aquatic species (including fishes and amphibians) and habitat modifications (e.g., reservoirs, altered flow regimes, *etc*.) have resulted in increased predator populations in numerous river systems, thereby increasing the level of predation experienced by native salmonids (Busby *et al.* 1996). Non-native species, particularly fishes and amphibians such as large and smallmouth basses and bullfrogs have been introduced and spread widely. These species can prey upon rearing juvenile steelhead (and their conspecific resident forms), compete for living space, cover, and food, and act as vectors for non-native diseases. Artificially induced summer low-flow conditions may also benefit non-native species, exacerbate spread of diseases, and permit increased avian predation.

In previous status reviews for this species, NMFS did not conclude that disease and predation were significant factors responsible for the decline of steelhead in this DPS. However, small populations of steelhead such as those found in the S-CCC steelhead DPS may be more vulnerable to the effects of disease and/or predation particularly in combination with the synergistic effects of other threats. In addition, the effects of disease or predation may be heightened under conditions of periodic low flows or high temperatures which are characteristic of watersheds in this DPS.

2.2.2.10 Global Climate Change

Another factor affecting the rangewide status of S-CCC steelhead and their critical habitat at large is climate change. Impacts from global climate change are already occurring in California. For example, average annual air temperatures, heat extremes, and sea level have all increased in California over the last century (Kadir *et al.* 2013). Snow melt from the Sierra Nevada has declined (Kadir *et al.* 2013). However, total annual precipitation amounts have shown no discernible change (Kadir *et al.* 2013). S-CCC steelhead may have already experienced some detrimental impacts from climate change. NMFS believes the impacts on listed salmonids to date are likely fairly minor because natural, and local, climate factors likely still drive most of the climatic conditions steelhead experience, and many of these factors have much less influence on steelhead abundance and distribution than human disturbance across the landscape. In addition, S-CCC steelhead are not dependent on snowmelt driven streams and thus not directly affected by declining snow packs.

The threat to S-CCC steelhead from global climate change will increase in the future. Modeling of climate change impacts in California suggests that average summer air temperatures are expected to continue to increase (Lindley *et al.* 2007; Moser *et al.* 2012). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe *et al.* 2004; Moser *et al.* 2012; Kadir *et al.* 2013). Total precipitation in California may decline; critically dry years may increase (Lindley *et al.* 2007; Schneider 2007; Moser *et al.* 2012). Wildfires are expected to increase in frequency and magnitude (Westerling *et al.* 2011; Moser *et al.* 2012). Many of these changes are likely to further degrade S-CCC habitat by, for example, reducing streamflows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to salmonids. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia *et al.* 2002; Ruggiero *et al.* 2010). In marine environments, ecosystems and habitats important to juvenile and adult salmonids are likely to experience changes in temperatures, circulation, water chemistry, and food supplies (Feely 2004; Brewer and Barry 2008; Osgood 2008; Turley 2008; Abdul-Aziz *et al.* 2011; Doney *et al.* 2012).

The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007; Santer *et al.* 2011).

2.3 Action Area

"Action Area" means all areas to be affected directly or indirectly by the Federal Action and not merely the immediate area involved in the action (50 CFR 402.02). The action area is located in Santa Margarita Creek, tributary to the Salinas River. Specifically, the action area is located in San Luis Obispo County, California within the Santa Margarita Valley, at the El Camino Real Bridge crossing at latitude/longitude 35.428621˚/-120.605678˚. The action area extends along 263 linear feet of the Santa Margarita Creek and includes areas that may be affected by stream dewatering, temporary berms, fish capture and relocation, temporary road crossings, and construction activities; including the bed, left and right banks,[5] and riparian corridor.

2.4 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).

The following sub-sections provide information on watershed-wide conditions affecting the action area, and conditions specific to the action area.

[5] Left and right as oriented when facing downstream.

2.4.1 General Watershed Description

The Santa Margarita Creek watershed covers 23,774 acres and contains approximately eight miles of streambed before its confluence with the Salinas River. The Salinas River flows from San Luis Obispo County north into Monterey County and outlets into the Pacific Ocean approximately 115 miles north, near the town of Castroville. The Santa Margarita Creek is divided between intact habitat conditions in the headwaters and degraded habitat conditions in the lower sections of stream (NMFS 2010). The majority of the land through which the Santa Margarita Creek flows is oak woodland/savannah primarily used as cattle range land. The climate in the region is Mediterranean, with long dry summers and brief winters with rainfall restricted almost exclusively to the late fall, winter, and early spring months (November through May). Flows within the watershed are highly variable and can go from low base flow conditions to high flows following rainfall, and then quickly recede again. The mean average precipitation ranges from 12-20 inches and the mean annual temperature is 60 degrees Fahrenheit (Lindsey 1983).

Santa Margarita Creek watershed is located in the greater Salinas River watershed, which is a part of the Interior Coast Range Biogeographic Population Group (BPG). This BPG consists of two major watersheds, the Pajaro River and the Salinas River. The Salinas River steelhead run was identified as a Core 1 population within NMFS' S-CCC steelhead DPS recovery plan and is targeted by NMFS for increased conservation and recovery efforts (NMFS 2013). The Salinas River includes the Upper and Lower Salinas populations of S-CCC steelhead. Major threats to the Salinas River populations include: dams, water diversions, and land-use activities associated with agriculture, mining, and ranching (NMFS 2013). Agricultural development of riparian corridors has led to a reduction of channel complexity and groundwater levels through groundwater extraction for irrigation as well as a reduction in water quality from runoff containing fine sediment, pesticides, and fertilizers (NMFS 2013). Instream gravel mining operations in the Salinas River have also led to a decrease in habitat quality by increasing turbidity, reducing habitat complexity, and impeding sediment transport. High priority recovery actions prescribed by NMFS (2013) to address impairments in the Salinas River include: conduct a watershed-wide fish passage barrier assessment, develop and implement plan to remove or modify these barriers; develop and implement water management plans for dam and diversion operations; provide fish passage around dams and diversions; conduct groundwater extraction analysis, develop and implement a groundwater management and monitoring program; and improve substrate quality by managing instream mining operations.[6]

In addition to the aforementioned threats in the Salinas River watershed, including the action area, the threat to S-CCC steelhead from climate change is likely going to mirror what is expected for the rest of Central California (see Section 2.2.4.10 *Global Climate Change*). NMFS expects that average summer air temperatures in the watershed would continue to increase, heat waves would become more extreme, and droughts and wildfire would occur more frequently (Lindley *et al.* 2007; Moser *et al.* 2012, Hayhoe *et al.* 2004, Moser *et al.* 2012; Kadir *et al.* 2013,

[6] Recovery action identification numbers: Sal-SCCCS-3.1, Sal-SCCCS-3.2, Sal-SCCCS-4.1, Sal-SCCCS-4.2, Sal-SCCCS-4.3, Sal-SCCCS-6.1, and Sal-SCCCS-6.2 (respectively).

Schneider 2007, Westerling *et al.* 2011). Over the next 100 years (the lifespan of the proposed bridge), these changes are likely to further degrade S-CCC habitat throughout the watershed by, for example, reducing streamflow during the summer and raising summer water temperatures.

2.4.2 Status of Listed Species and Habitat in the Action Area

The action area is designated critical habitat for S-CCC steelhead and includes sites supporting migration and rearing of S-CCC steelhead. Primary biological features of these sites include substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, riparian vegetation, space, food, and safe passage conditions.

The following sub-sections describe expected S-CCC steelhead use of the action area, and previous ESA section 7 consultations and section 10 permits in the area.

2.4.3 Habitat Conditions and Steelhead in the Action Area

Within the project area, the creek channel is characterized as having large areas of exposed sandstone bedrock. The layers of sandstone are angled upward at an approximate 45 degree angle and perpendicular to the bank. Ground water cannot completely penetrate the sandstone bedrock and must flow over the underlying rock, resulting in perennial flow through the action area. Over time, the creek has carved a series of plunge pools between the layers of sandstone. There are four such pools within the action area, ranging between 60 and 100 feet wide and 4 to 6.5 feet deep. Streambanks in the action area are variable, but generally steep and incised and vegetated with native riparian emergent vegetation, shrubs, and trees. Habitat impairments associated with the existing bridge are present in the action area and affect PBFs in the action area - abutments in the streambank confine the channel and prevent channel migration, in-channel piers confine flows and alter sediment and debris transport, and scour protection and bank stabilization constrain flows and impair bed and bank habitat. Constraints such as these have the potential to impair habitat complexity and steelhead use. However, while habitat limitations do exist in the action area, current conditions are not so severe that steelhead use is likely significantly impaired – there are no passage impediments, riparian cover is present, and perennial pools are present. These habitat features provide conditions with water quantity, water temperature, water velocity, cover/shelter, riparian vegetation, space, food and safe passage conditions supporting steelhead migration and rearing.

Steelhead have been observed both upstream of, and within, the action area. There are no surveys providing steelhead density data for the action area; however, a survey conducted within the proposed action area for the El Camino Real Bridge at Santa Margarita Creek Scour Project observed S-CCC steelhead during both night- and day-time surveys (Hutchinson 2012). Also in July 2012, 375 feet of Santa Margarita Creek approximately 4 miles upstream of the project site were dewatered for the Highway 101 bridge rehabilitation project. A total of 40 *O. mykiss* were captured and relocated from the project site (SWCA Consulting 2013). Based on the aforementioned project's density of 40 *O. mykiss* per 375 feet of channel (0.1 fish per foot) (SWCA Consulting 2013) and previous observations of *O. mykiss* in the action area (Hutchinson 2012), NMFS expects that steelhead will be present in the action area at a density of approximately 0.1 fish per foot of stream.

2.4.4 Previous Section 7 Consultations and Section 10 Permits in the Action Area

NMFS has not previously conduced any interagency consultations pursuant to section 7 of the ESA that have affected the action area of this project. Stream restoration under programmatic consultations and salmonid monitoring actions may take place in the action area. These programmatic consultations include the NOAA Restoration Center's (RC) restoration program, and the Regional General Permit programmatic consultation with the California Department of Fish and Wildlife (CDFW). These consultations anticipate a limited amount of take for juvenile salmonids during instream work conducted in the summer months. NMFS determined these restoration actions are likely to improve habitat conditions for listed species and that the limited amount of take anticipated is unlikely to affect future adult returns. NMFS' section 10(a)(1)(A) research and enhancement permits and section 4(d) limits or exceptions could potentially occur in the watershed, including the reach of Santa Margarita Creek in the action area. Salmonid monitoring approved under these programs includes carcass surveys, smolt outmigration trapping, and juvenile density surveys. In general, these activities are closely monitored and require measures to minimize take during the research activities. NMFS has determined these research projects are unlikely to affect future adult returns.

2.5 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.

In this biological opinion, our approach to determine the effects of the action was based on institutional knowledge and a review of the ecological literature and other relevant materials. We used this information to gauge the likely effects of the proposed project via an exposure and response framework that focuses on the stressors (physical, chemical, or biotic), directly or indirectly caused by the proposed action, to which S-CCC steelhead are likely to be exposed. Next, we evaluate the likely response of the above listed fish to these stressors in terms of changes to survival, growth, and reproduction, and changes to the ability of PBFs to support the value of critical habitat in the action area. PBFs include sites essential to support one or more life stages of the species. These sites for migration, spawning, and rearing in turn contain physical and biological features that are essential to the conservation of the species. Where data to quantitatively determine the effects of the proposed action on listed fish and their critical habitat were limited or not available, our assessment of effects focused mostly on qualitative identification of likely stressors and responses.

The proposed project may affect S-CCC steelhead and critical habitat. The effects of the proposed action are reasonably likely to include: adverse effects to S-CCC steelhead from fish collection; adverse effects to S-CCC steelhead from dewatering; insignificant effects to steelhead and critical habitat from temporary reductions in riparian vegetation; insignificant effects to steelhead and critical habitat from temporary increases in suspended sediment concentrations; a

discountable potential for fish and habitat to be exposed to construction debris and materials; and insignificant effects to steelhead and habitat resulting from the placement of structures (bridge) in the channel.[7] Although some of these effects are insignificant and discountable, they are considered and addressed in the remainder of this analysis, particularly the Integration and Synthesis portion of the opinion.

2.5.1 Fish Collection and Relocation

To facilitate construction of the project, approximately 120 feet of the mainstem Santa Margarita Creek streambed may be dewatered. To avoid fish stranding and exposure to construction activities, fish in the work area will be collected and relocated prior to, and during dewatering. Before and during dewatering of the construction site, S-CCC steelhead and other fish will be captured by a qualified fisheries biologist using one or more of the following methods: dip net, seines, throw net, block net, minnow trap, or by hand. Collected fish will be immediately returned to the stream at suitable locations in the Santa Margarita Creek immediately downstream of the dewatered area.

Because dewatering activities will be limited to the summertime construction window (June 15 – October 15), capture and relocation of listed steelhead will be limited to juveniles. As described above in the Environmental Baseline, we expect an average density estimate of 0.1 steelhead per foot of channel. Because the proposed total amount of dewatering length for the project is 120 feet (see 1.3 Proposed Action), NMFS estimates that no more than 12 S-CCC juvenile steelhead will be handled and relocated annually during the two year-implementation of the project. Because construction is expected to take two construction seasons (i.e., two years of construction, with in-channel work occurring between June 15 and October 15 each year) we expect that fish handling and relocation may occur twice. Therefore, we expect that up to 24 juvenile S-CCC steelhead may be handled over the two-year course of project construction.

Fish relocation activities pose a risk of injury or mortality to rearing juvenile salmonids. Any fish collecting gear, whether passive (Hubert 1996) or active (Hayes *et al.* 1996) has some associated risk to fish, including stress, disease transmission, injury, or death. The amount of unintentional injury mortality attributable to fish capture varies widely, depending on the method used, the ambient conditions, and the expertise and experience of the field crew. Since fish relocation activities will be conducted by qualified fisheries biologists following NMFS electrofishing guidelines (NMFS 2000), injury and mortality of juvenile salmonids during capture and relocation will be minimized. Data on fish relocation efforts between 2002 and 2009 show most mortality rates are below 3 percent (2 percent) for steelhead (Collins 2004; CDFG 2005, 2006, 2007, 2008, 2009, 2010). Based on this information, NMFS estimates injury and mortalities will be 2 percent of the steelhead that are relocated. If injury and mortality rates reach maximum levels, up to one S-CCC juvenile steelhead is expected to be killed as a result of injury or mortality during relocation efforts annually during the two-year implementation of the project.[8] Because there will be one dewatering event in each of the two construction seasons, we expect

[7] Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

[8] (24 steelhead estimated to be present within the area to be dewatered) x (2% mortality rate) = 0.48 steelhead mortalities during fish handling and relocation activities. Rounding this yields an estimate of 1 steelhead mortality.

that fish handling and relocation may happen twice. Therefore, we expect that up to two juvenile S-CCC steelhead may be killed over the two-year course of project construction.

Relocated fish may also have to compete with other fish causing increased competition for available resources such as food and habitat. Responses to crowding by salmonids include self-thinning, resulting in emigration and reduced salmonid abundance with increased individual body size within the group and/or increased competition (Keeley 2003). Some of the fish released at the relocation sites may choose not to remain in these areas and move either upstream or downstream to areas that have more vacant habitat and a lower density of fish. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. In some instances, relocated fish may endure short-term stress from crowding at the relocation sites. Such stress is not likely to be sufficient to reduce their individual performance.

Fish that avoid capture during relocation effects may be exposed to risk described in the following section on dewatering (see 2.5.2 Project Site Dewatering).

2.5.2 Project Site Dewatering

As described above, the project will require dewatering of approximately 120 feet of the mainstem of the Santa Margarita Creek. Dewatering is expected to last between June 15 and October 15 for both years of construction. Temporary berms constructed of gravel bags and/or sand will be used to isolate work areas, and these work areas will be dewatered with pumps. NMFS anticipates temporary changes to instream flow within the work areas. Isolation and dewatering of these work areas is expected to cause temporary loss, alteration, and reduction of aquatic habitat, and may result in mortality of any salmonids that avoid capture during fish relocation activities. Steelhead juveniles within these work areas may be injured or killed by concentrating or stranding them in residual wetted areas, or entrapping them within the interstices of channel substrate where they may not be seen by fish relocation personnel. Steelhead juveniles that avoid capture in the project work area will likely die due to desiccation, thermal stress, or crushing. However, fish relocation efforts (described above) are expected to be effective at removing fish in the work areas. Because of this, NMFS expects that the number of juvenile steelhead that may be missed and have the potential to be left within the dewatered area will be very low; less than one percent of the fish within the action area prior to dewatering. Based on this, NMFS estimates that up to one steelhead may be killed during each of the channel dewatering events.[9] Because there will be one dewatering event in each of the two construction seasons, we expect that fish handling and relocation may happen twice. Therefore, we expect that up to one juvenile S-CCC steelhead may be killed during dewatering operations, annually, and up to two juvenile S-CCC steelhead may be killed during dewatering operations over the two-year course of project construction.

Dewatering operations may also affect aquatic food sources that S-CCC steelhead feed on. Benthic (bottom dwelling) aquatic macroinvertebrates, an important food sources for salmonids, may be killed or their abundance reduced when creek habitat is dewatered (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from stream flow diversions and

[9] (Up to 26 steelhead expected to be within the area to be dewatered) x (up to 1 steelhead mortality / 100 steelhead) = 0.26 steelhead mortalities. Rounding this yields an estimate of 1 steelhead mortality.

dewatering will be temporary because construction activities will be relatively short-lived. Rapid recolonization, typically within one to two months, of disturbed areas by macroinvertebrates is expected following rewatering (Cushman 1985, Thomas 1985, Harvey 1986). In addition, the effect of macroinvertebrate loss on juvenile salmonids is likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream flow, if present, will be bypassed around the project work site. The temporary loss of 120 linear feet of instream habitat for the construction period is not expected to permanently impair designated habitat because aquatic and riparian habitat at the site would be returned to pre-project conditions after the water diversion system is removed. The temporary berms and water diversion structure in the action are not expected to impact steelhead outside the dewatered area because effects will be limited to the action area, dewatering will occur for a limited duration, and the dewatered area will be relatively small compared to the available habitat within the Santa Margarita Creek watershed in and near the action area. Fish will be able to find food and cover outside of the action area as needed to maintain their fitness during project construction. Based on the foregoing, steelhead are not anticipated to be exposed to a reduction in food sources from the minor and temporary reduction in aquatic macroinvertebrates as a result of dewatering activities.

2.5.3 Increased Suspended Sediment Concentrations

Instream and near-stream construction activities have been shown to result in temporary increases in suspended sediment concentrations (reviewed in Furniss *et al.* 1991, Reeves *et al.* 1991, Spence *et al.* 1996). High suspended sediment concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and can also cause fish mortality (Sigler *et al.* 1984, Berg and Northcote 1985, Gregory and Northcote 1993, Velagic 1995, Waters 1995). For fish exposed to high concentrations of suspended sediment, normal feeding behavior and feeding efficiency may be disrupted (Cordone and Kelley 1961, Berg and Northcote 1985), growth rates may be reduced (Crouse *et al.* 1981), and plasma cortisol levels may be increased (Servizi and Martens 1992); indicating the potential for increased stress and impaired physiological condition. Increased sediment concentrations can result in increased sediment deposition, which can fill pools, reduce the amount of cover and habitat available, and smother coarse substrate particles which can impair macroinvertebrate composition and abundance (Sigler *et al.* 1984, Alexander and Hansen 1986).

NMFS anticipates the project will affect water quality and critical habitat in the action area in the form of small, short-term increases in suspended sediment concentrations during re-watering and subsequent higher flow events during winter storms between the two construction years and the first winter storms post-construction. Based on the relatively small work area and the use of methods to control sediment, NMFS expects any sediment generated by the project would not extend more than 100 feet downstream of the work area. Although chronic elevated suspended sediment levels may affect steelhead and critical habitat, sedimentation and turbidity levels associated with the Project are not expected to rise to the levels discussed in the previous paragraph. For this project, minimal amounts of stream bed and bank will be disturbed and measures to stabilize sediment during and after construction are expected to effectively minimize the effects of suspended sediment concentrations on fish and habitat. During construction,

erosion control prevention and control measures will be used to hold soil and sediment in place on the bank. Post-construction, disturbed areas would be stabilized with geotextile fabric and/or vegetative plantings, as appropriate. These measures will be in place between construction seasons and installed following the second (final) year of construction, and are expected to minimize the discharge of sediment during and after construction to levels insufficient to injure or kill fish, or degrade habitat. Thus, it is unlikely that any meaningful amount of suspended sediment effects will result from this project, and any project-related suspended sediment effects that do result will be temporary and will likely have an insignificant impact on S-CCC steelhead and their critical habitat.

2.5.4 Toxic Chemicals

Construction operations in, over, and near surface water have the potential to release contaminants into surface waters. Projects of this type have the potential to introduce oils and hydrocarbons from construction equipment into surface waters. Oils and hydrocarbons can contain a wide variety of polynuclear aromatic hydrocarbons (PAHs), and metals. PAHs can alter salmonid egg hatching rates and reduce egg survival as well as harm the benthic organisms that are a salmonid food source (Eisler 2000). Some of the effects that metals can have on salmonids are: immobilization and impaired locomotion, reduced growth, reduced reproduction, genetic damage, tumors and lesions, developmental abnormalities, behavior changes (avoidance), and impairment of olfactory and brain functions (Eisler 2000). These effects have the potential to harm exposed fish and temporarily degrade habitat. However, the project includes BMPs to address spills and prevent the introduction of contaminants into Santa Margarita Creek. The work areas will be isolated; project limits will be clearly delineated; no equipment is proposed to be fueled or otherwise serviced within the stream bed; spill containment materials will be present on site; and proper handling and disposal of all construction waste will occur. Due to these measures, conveyance of toxic chemicals into Santa Margarita Creek during project implementation is not expected, and the potential for the project to degrade water quality and harm S-CCC steelhead and their critical habitat is considered to be discountable.

2.5.5 Removal of Riparian Vegetation

Riparian vegetation helps maintain stream habitat conditions necessary for steelhead. Riparian zones serve important functions in stream ecosystems such as providing shade (Poole and Berman 2001), sediment storage and filtering (Cooper *et al.* 1987, Mitsch and Gosselink 2000), nutrient inputs (Murphy and Meehan 1991), water quality improvements (Mitsch and Gosselink 2000), channel and stream bank stability (Platts 1991), source of woody debris that creates fish habitat diversity (Bryant 1983, Lisle 1986, Shirvell 1990), and both cover and shelter for fish (Bustard and Narver 1975, Wesche *et al.* 1987, Murphy and Meehan 1991). Riparian vegetation disturbance and removal can degrade these ecosystem functions and impair stream habitat. Where riparian vegetation is impaired, steelhead may be exposed to poor: shade, substrate, water quality, habitat diversity, cover, and shelter. These habitat impairments have the potential to limit or preclude successful spawning and rearing, reduce adult migration success, and expose juveniles and smolts to increased predation.

This project will result in temporary reductions in riparian vegetation due to the removal and replanting of riparian vegetation that will occur along the bed and banks of Santa Margarita Creek. Because riparian vegetation typically begins to provide habitat benefits relatively rapidly during reestablishment, usually within the first one to two years following planting, these impacts will be temporary. However, during the approximately one- to two-year-long duration while the riparian vegetation is beginning to reestablish, steelhead in the action area will be exposed to reduced riparian cover; potentially exposing them to habitat limitations described in the preceding paragraph.

During this period, rearing juveniles may seek alternative areas where suitable cover exists nearby, and migrating adults and smolts may encounter instream habitat within the action area that lacks complexity, cover, and velocity refuge. Temporary displacement of the densities of juveniles expected to occur in the action area (up to 12 juvenile steelhead per year – see 2.5.1 Fish Collection and Relocation) is not expected to reduce individual performance because available cover nearby is expected to accommodate additional displaced juveniles without resulting in overcrowding.

Reduced riparian cover could expose migrating adults and smolts to impaired migration or increased predation. Depending on the severity of exposure, injury or mortality of individuals could result. For this project, S-CCC steelhead smolts and adults will be transiting through the action area quickly and will experience the effects of vegetation removal for a short period of time only. This level of exposure is not expected to increase injury or mortality, decrease fitness, or impair migrations. Further, these conditions are expected to be relatively short-lived (approximately one to two years in duration) because riparian vegetation is expected to rapidly recolonize the affected areas following revegetation of the site, and temporary impacts to riparian habitat will likely have an insignificant impact on the function and ability of that habitat to meet the short-term and long-term needs of steelhead in Santa Margarita Creek. Also, because disturbed areas will be replanted with native vegetation, including riparian trees (see 1.3 Proposed Federal Action), temporarily reduced riparian function will be restored; resulting in permanent restoration of riparian condition throughout the project area.

2.5.6 Impaired Habitat Conditions from In-channel Structures

Development in and over channels has the potential to impair stream habitat. Habitat impairments associated with the existing bridge are present in the action area - abutments in the streambank confine the channel and prevent channel migration, in-channel piers confine flows and alter sediment and debris transport, and scour protection and bank stabilization constrain flows and impair bed and bank habitat. These constraints have the potential to result in poor habitat complexity, including poor cover and poor refugia. However, while habitat limitations do exist in the action area, current conditions are not so severe that steelhead use is likely significantly impaired – there are no passage impediments, riparian cover is present, and the persistence of perennial pools provides cover and refuge habitat supporting migration and rearing.

Replacement of the existing bridge with a new bridge in the same location as the existing bridge has the potential to perpetuate bridge-related constraints in the action area. The new bridge will

have in-bank abutments, in-channel piers, and scour protection. Such features have the potential to: reduce water quantity; reduce or prevent floodplain connectivity and channel functions that form and maintain physical habitat conditions; impair water quality and forage; reduce natural cover; and create obstructions to migration. Such impairments have the potential to impair PBFs of critical habitat for S-CCC steelhead. However, while this project does include structures that could result in such impairments, this project is not expected to significantly impair PBFs of critical habitat for S-CCC steelhead. The bridge will not permanently alter water quantity. Flow conveyance supporting channel maintenance and floodplain connectivity will be supported because the bridge has been designed to pass flow and debris during 100-year recurrence interval flow events and will support maintenance of channel complexity. Scour protection will be limited in area, and buried and planted with native riparian species to support maintenance of channel complexity, cover and shelter. Pools, which provide cover and refuge, will be maintained, and no structures that would be expected to cause an obstruction to fish passage are proposed. Thus, while projects with in-channel structures have the potential to impair PBFs necessary for the support of S-CCC steelhead migration and rearing, generally, the effects of in-channel structures resulting from this specific project are not expected to result in significant impacts to S-CCC steelhead or S-CCC steelhead critical habitat.

In addition, this project is expected to incrementally improve S-CCC steelhead in the action area. As noted above, habitat limitations resulting from the current bridge are not so severe that steelhead use is likely significantly impaired – there are no passage impediments, riparian cover is present, and perennial pools are present. However, compared to the old bridge, the new bridge will further reduce in-channel structures and their associated habitat impairments. The new bridge will have:

- a greater cross-channel width (setting the abutments back within the banks, and increasing the channel width by approximately 59 feet),[10]
- fewer pier sets in the channel (reducing the pier sets from four to two),
- less hardscape in the channel than the old bridge (approximately 0.001 acres less), and
- buried/planted RSP.

These improvements, as well as the overall bridge design, will provide improved flow and debris conveyance and reduced habitat effects (as compared to the old bridge) – increased channel width and reduced number of pier sets will improve debris, flows and sediment conveyance, and burying and planting the RSP will facilitate riparian establishment along the streambanks. Because the habitat conditions in the action area already support S-CCC steelhead, and the new bridge is expected to result in improved conditions, we expect that the new bridge will subtly improve habitat conditions in the action area.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action

[10] See Section 1.3. Bridge length (the bridge axis that spans the channel width) will increase from 81 feet to 140 feet. 140 feet – 81 feet = 59 feet.

are not considered in this section because they require separate consultation pursuance to section 7 of the ESA.

NMFS does not anticipate any cumulative effects in the action area other than those ongoing actions already described in the Environmental Baseline above, and resulting from climate change. Given current baseline conditions and trends, NMFS does not expect to see significant improvement in habitat conditions in the near future due to existing land and water development in the watershed.

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.* those that are a result of cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.4).

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminishes the value of designated or proposed critical habitat for the conservation of the species. In this section we also consider the potential for climate change to alter conditions in the action area beyond the scope considered in this opinion, and the potential effects of the project on the population's ability to achieve recovery criteria.

2.7.1 S-CCC Steelhead

Juvenile S-CCC steelhead are expected to be present in the action area during project implementation. Factors responsible for the decline of S-CCC Steelhead and their critical habitat include: habitat alteration, water use, estuarine habitat loss, fishing harvest, artificial propagation, various environmental factors, ocean conditions, reduced marine-derived nutrient transport, disease and predation, and global climate change. The Salinas River population of S-CCC steelhead is important to the recovery of the DPS and is severely depressed compared to historic conditions. Factors responsible for the condition of S-CCC steelhead in the Salinas River watershed include: partial and complete passage barriers; flow reductions from water diversion and groundwater extraction; habitat fragmentation and degradation; and climate change. These factors affect instream habitat, access to spawning and rearing habitat, and water quality and quantity. The above-mentioned factors affecting steelhead in the broader Salinas River watershed also affect steelhead in Santa Margarita Creek and the action area.

As described in the *Effects of the Action* (Section 2.5), NMFS identified the following components of the project as likely to result in effects to S-CCC steelhead and/or habitat: fish collection and relocation; dewatering; temporary reductions in riparian vegetation; temporary increases in suspended sediment concentrations; exposure to construction debris and materials; and altered habitat conditions from installation of structures in the channel.

Adverse effects associated with the project that have the potential to result in injury and mortality of S-CCC steelhead juveniles include: fish collection and relocation, and dewatering. However, NMFS expects that low numbers of S-CCC steelhead juveniles will be present in the action area to be exposed to these effects, and that few, if any, S-CCC steelhead juveniles may be injured or killed by these activities. Anticipated mortality from relocation is expected to be less than three percent (2 percent) of the fish relocated, and mortality expected from dewatering is expected to be less than one percent of the fish in the area prior to dewatering. Because no more than 12 S-CCC steelhead juveniles are expected to be present within the dewatered reach in any one year, and no more than two dewatering events will occur in two years, NMFS expects no more than 2 steelhead juveniles will be harmed or killed during fish collection and relocation, and site dewatering. Any S-CCC steelhead present would likely make up a very small proportion of the steelhead in the Santa Margarita Creek watershed. Also, due to the relatively large number of juveniles produced by each spawning pair, spawning in the watershed in future years would be expected to produce enough juveniles to replace any juveniles that may be lost at the project site due to relocation and dewatering. It is unlikely that the small potential loss of juveniles by this project would impact future adult returns.

In addition to the adverse effects, we also consider insignificant and discountable effects of the project. We expect a discountable potential for fish and habitat to be exposed to construction debris and materials. We also expect that temporary reductions in riparian vegetation, temporary increases in suspended sediment concentrations, and permanent placement of in-channel bridge structures will result in insignificant effects to steelhead and habitat. We do not expect these aforementioned insignificant and discountable effects to occur simultaneously with other effects in any significant way. Nor do we expect these effects to occur when steelhead are likely to be present in the action area. Thus, the temporary effects expected from construction, riparian removal, or suspended sediment increases are not expected to affect S-CCC steelhead in any significant way.

Because we do not expect the potential adverse effects of the project (fish collection and relocation, and dewatering) to impact S-CCC steelhead in Santa Margarita Creek, and we also do not expect temporary effects from exposure to construction debris and materials, reductions in riparian vegetation, increases in suspended sediment concentrations, or placement of in-channel bridge structures to affect S-CCC steelhead in any significant way.

Climate change will likely adversely affect S-CCC steelhead in the action area over the 100-year lifetime of the new bridge. The predicted increase in summer temperatures could lead to reduced growth rates and lower survival for stream rearing juveniles. Similarly, lower precipitation could lead to reduced stream flows, increased stream drying, and less food availability via invertebrate drift. However, it is difficult to predict with any level of accuracy what the effects of climate change will be at this particular site beyond those effects already considered in the baseline and

cumulative effects discussions. Considering these adverse effects in combination with the effects of the project on S-CCC steelhead, we do not expect the project to impair the persistence or recovery of the DPS.

2.7.2 S-CCC Steelhead Critical Habitat

The action area contains critical habitat for S-CCC steelhead. In our adverse modification analysis, we consider the condition of critical habitat, the potential effects of the project on critical habitat, and whether or not those effects are expected to directly or indirectly diminish the value of critical habitat for the conservation of S-CCC steelhead. We also consider the potential for climate change to alter conditions in the action area such that critical habitat may be affected over the duration of time we consider for this consultation (100 year lifespan of the bridge). These elements (condition of critical habitat across the DPS, in the watershed, and in the action area; effects of the project on critical habitat; and effects of climate change on critical habitat) are considered further below.

Across the DPS, S-CCC steelhead critical habitat has been degraded by habitat destruction and fragmentation. While conditions vary across the DPS, critical habitat is generally impaired by: altered stream bank and channel morphology; altered stream water temperatures; degraded water quality; spawning and rearing habitat loss; riparian vegetation loss; increased stream bank erosion; increased sedimentation into spawning and rearing areas; and degraded habitat complexity, including poor pool, substrate, and LWD conditions. These factors also affect S-CCC steelhead critical habitat in the Salinas River watershed, including Santa Margarita Creek, which has been impaired by passage barriers, watershed development (including urban and agricultural development), and water-system development; resulting in habitat fragmentation, habitat impairment, degraded water quantity, and impaired passage throughout much of the watershed. Both watershed-wide factors and action area-specific factors affect critical habitat in the action area - watershed development impairs habitat, and the existing bridge causes localized habitat impairments.

Effects to S-CCC steelhead critical habitat from the proposed project are expected to include temporary and permanent impacts. The temporary impacts are expected to be associated with disturbances to the stream bed, bank, riparian corridor, and surface flow during construction. As discussed above, these temporary impacts are not expected to adversely affect PBFs of S-CCC steelhead critical habitat because aquatic habitat at the site would be restored after the water diversion system is removed. Permanent impacts will be associated with the placement of in-channel structures. However, the bridge has also been designed to minimize permanent impacts to the channel, and is not expected to adversely affect PBFs of S-CCC steelhead critical habitat. These temporary and permanent impacts to critical habitat are not expected to impair the conservation or recovery of S-CCC steelhead DPS as a whole. Additionally, compared to the existing condition, the new bridge will have less in-channel structures and improved flow and conveyance, resulting in an incremental benefit to S-CCC critical habitat in the action area.

Climate change will likely adversely affect habitat conditions in the action area within the timeframe we are considering for this consultation (the duration between mid-2019 when construction begins, and 2119 when the bridge reaches its 100-year design-life), and ongoing

anthropogenic impairments common throughout the watershed (e.g., development and adverse channel modification) are also likely to persist within this timeframe. We expect conditions to worsen beyond those currently occurring in the action area. For example, there may be a greater frequency of extreme storms, higher average summer air temperatures and lower total precipitation levels; potentially resulting in warmer stream temperatures, and reduced stream flow in the summers. Similarly, regarding anthropogenic impairments affecting recovery, development and adverse channel modification are already prevalent and are likely to persist over the long-term. Since climate change effects could exacerbate these conditions, the effects of climate change could significantly worsen existing conditions over the timeframe considered in this biological opinion.

Considering the above, temporary impacts of the project are not expected to adversely affect S-CCC steelhead critical habitat, permanent effects of the project and effects of climate change are expected to result in adverse effects to critical habitat; however, these adverse effects are not expected to impair the conservation or recovery of S-CCC steelhead. Considering the effects of the project together with the potential adverse effects of climate change at the site, the project is not expected to adversely modify S-CCC steelhead critical habitat at the DPS level.

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, 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 S-CCC steelhead or destroy or adversely modify designated critical habitat for this species.

2.9 Incidental Take Statement

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

2.9.1 Amount or Extent of Take

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

Take of listed S-CCC steelhead may occur during fish relocation and dewatering within the 120-foot reach at the project site between June 15 and October 15 in 2020 and 2021. Dewatering is expected to occur once in each year of construction, up to two times in the two years proposed for construction. The number of threatened S-CCC steelhead that may be incidentally taken during project activities is expected to be small, and limited to summer rearing juvenile steelhead. NMFS expects that no more than 2 percent of the fish within the 120 feet of dewatered area will be injured, harmed or killed during fish relocation. NMFS also expects that no more than 1 percent of the fish within the 120 feet of dewatered area will be injured, harmed or killed during dewatering activities. Because no more than 12 steelhead juveniles are expected to be present within the 120-foot-long dewatering reach in any one of the two construction years, and dewatering is expected to occur no more than two times in two years, NMFS expects no more than 4 S-CCC steelhead will be harmed or killed by the project (see 2.7 Integration and Synthesis). If more than 12 steelhead are captured in any one of the two years, or more than 1 steelhead juvenile is harmed or killed in any one of the two years, incidental take will have been exceeded.

2.9.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.9.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of S-CCC steelhead:

1. Undertake measures to ensure that injury and mortality to steelhead resulting from fish relocation and dewatering activities is low.

2. Undertake measures to minimize harm to steelhead from construction of the project and degradation of aquatic habitat.

3. Prepare and submit plans and reports regarding the effects of fish relocation, construction and post-construction site performance.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and Caltrans and the County of San Luis Obispo must comply with them in order to implement the reasonable and prudent measures (50 CFR 402.14). Caltrans and the County of San Luis Obispo have 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. The County of San Luis Obispo will retain qualified biologists with expertise in the areas of anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. The County of San Luis Obispo will ensure that all biologists working on the project are qualified to conduct fish collections in a manner which minimizes all potential risks to steelhead. Electrofishing, if used, will be performed by a qualified biologist and conducted according to the *NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000*. See: http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf .

    b. The biologists will monitor the construction site during placement and removal of cofferdams, and channel diversions to ensure that any adverse effects to steelhead are minimized. The biologists will be on site during all dewatering events to capture, handle, and safely relocate steelhead. Caltrans, the County of San Luis Obispo, or the biologist will notify NMFS biologist Darren Howe at (707) 575-3152 or Darren.Howe@noaa.gov one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities.

    c. Steelhead will be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish will be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish will not be removed from this water except when released. To avoid predation, the biologists will have at least two containers and segregate young-of-year fish from larger age-classes and other potential aquatic predators. Captured steelhead will be relocated, as soon as possible, to a suitable instream location in which suitable habitat conditions are present to allow for adequate survival of transported fish and fish already present.

    d. If any salmonids are found dead or injured, the biological monitor will contact NMFS biologist, Darren Howe, by phone immediately at (707) 575-3152 or the NMFS North Central Coast Office (Santa Rosa, California) at 707-575-6050. The purpose of the contact is to review the activities resulting in mortality, determine if additional protective measures are required, and to ensure appropriate collection and transfer of salmonid mortalities and tissue samples. All salmonid mortalities will be retained. Tissue samples are to be acquired from each salmonid mortality per the methods identified in the NMFS Southwest Fisheries Science Center Genetic Repository protocols (contact the above NMFS staff for directions) and sent to: NOAA Coastal California Genetic Repository; Southwest Fisheries Science Center; 110 McAllister Way; Santa Cruz CA 95060.

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

    1. Caltrans and the County of San Luis Obispo will allow any NMFS employee(s) or any other person(s) designated by NMFS, to accompany field personnel to visit the project site during activities described in this opinion.

    2. Fill material for cofferdams will be fully confined with the use of plastic sheeting, sandbags, or with other non-porous containment methods, such that sediment does not come in contact with stream flow or in direct contact with the natural streambed. All loose fill material for cofferdams or access ramps will be completely removed from the channel by October 15.

    3. Any pumps used to divert live stream flow will be screened and maintained throughout the construction period to comply with NMFS' Fish Screening Criteria for Anadromous Salmonids. See: http://swr.nmfs.noaa.gov/hcd/fishscrn.pdf.

    4. Treated wood may not be used in any temporary platforms or scaffolds in the river channel. Lumber used for temporary construction operations must be unfinished and untreated wood. All materials used for temporary platforms or scaffolds must be completely removed from the channel no later than October 15.

    5. Construction equipment will be checked each day prior to work within the channel and, if necessary, action will be taken to prevent fluid leaks. If leaks occur during work in the channel, the County of San Luis Obispo or their contractor will contain the spill and remove the affected soils.

    6. Once construction is completed, all project-introduced material (pipe, gravel, cofferdam, etc.) must be removed, leaving the river as it was before construction. Excess materials will be disposed of at an appropriate disposal site.

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

    a. **Project Construction and Fish Relocation Report --** Caltrans or the County of San Luis Obispo must provide a written report to NMFS by January 15 of the year following construction of the project (2020). The report must be submitted to NMFS' North Central Coast Office, Attention: Central Coast Branch Chief, 777 Sonoma Avenue, Room 325, Santa Rosa, California, 954046528. The report must contain, at a minimum, the following information:

        i. Construction related activities -- The report(s) must include the dates construction began and was completed; a discussion of design compliance including: vegetation installation; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, including a description of any and all measures taken to minimize those unanticipated effects and a statement as to whether or not the unanticipated effects had any effect on ESA-listed fish; the number of salmonids killed or injured during the

project action; and photographs taken before, during, and after the activity from photo reference points.

ii. **Fish Relocation --** The report must include a description of the location from which fish were removed and the release site(s) including photographs; the date and time of the relocation effort; a description of the equipment and methods used to collect, hold, and transport salmonids; if an electrofisher was used for fish collection, a copy of the logbook must be included; the number of fish relocated by species; the number of fish injured or killed by species and a brief narrative of the circumstances surrounding ESA-listed fish injuries or mortalities; and a description of any problems which may have arisen during the relocation activities and a statement as to whether or not the activities had any unforeseen effects.

b. **Post-Project Annual Monitoring Reports –** Project annual reports will be sent to the address above in 3a, and must include the following contents:

i. **Post-Construction Vegetation Monitoring and Reporting** – Reports documenting post-project conditions of vegetation installed at the site will be prepared and submitted annually for the first five years following project completion, unless the site is documented to be performing poorly, then monitoring requirements will be extended. Reports will document vegetation health and survivorship and percent cover, natural recruitment of native vegetation (if any), and any maintenance or replanting needs. Photographs must be included. If poor establishment is documented, the report must include recommendations to address the source of the performance problems.

2.10 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). NMFS has no conservation recommendations at this time.

2.11 Reinitiation of Consultation

This concludes formal consultation for the El Camino Real at Santa Margarita Creek Bridge Replacement Project.

As 50 CFR 402.16 states, reinitiation 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.

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 a 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 citizens of affected areas, or others interested in the conservation of S-CCC steelhead. Individual copies of this opinion were provided to Caltrans.

This opinion will be posted on the Public Consultation Tracking System website (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts). The formatting and naming adheres to conventional standards for style.

3.2 Integrity

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

3.3 Objectivity

Information Product Category: Natural Resource Plan

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

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analysis in this opinion contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

4. REFERENCES

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