UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

June 9, 2020 **Refer to NMFS No:** WCRO-2019-03479

Randy LaVack
Caltrans Environmental Stewardship Branch Chief
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 Dover Canyon Road Bridge Replacement Project

Dear Mr. LaVack:

Thank you for your letter of October 28, 2019, 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 Dover Canyon Road Bridge Replacement Project. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

The enclosed biological opinion is based on our review of the proposed project and describes NMFS' analysis of potential effects on threatened South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*) and designated critical habitat in accordance with section 7 of the ESA. In the enclosed biological opinion, NMFS concludes 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.

Please contact Yvette Redler-Medina at 831 460-7564 or via email yvette.redler-medina@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Barrett Holland, Caltrans District 5, Barrett.Holland@dot.ca.gov
Copy to ARN File # 151422WCR2019SR00242

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion for the Dover Canyon Bridge Replacement Project

NMFS Consultation Number: WCRO-2019-03479

Action Agency: California Department of Transportation (Caltrans)

Table 1. Affected Species and NMFS' Determinations:

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

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: June 9, 2020

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1. INTRODUCTION

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

1.1 Background

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

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at NMFS North-Central Coast Office in Santa Rosa, California.

1.2 Consultation History

By letter dated October 28, 2019, the California Department of Transportation (Caltrans)[1] requested initiation of formal consultation with NMFS regarding Caltrans' proposed issuance of funding assistance to the County of San Luis Obispo, Department of Public Works (County) for the replacement of the Dover Canyon Road Bridge. Caltrans determined that the proposed project was likely to adversely affect threatened South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*) and their critical habitat. Upon review of the consultation package, which included the Dover Canyon Road at Jack Creek Bridge Replacement Project Biological Assessment (BA), NMFS issued a letter of insufficiency to Caltrans on November 27, 2019. By email on January 2, 2020, Caltrans requested additional time to provide information on the proposed action with which NMFS agreed by email on the same date. By email on January 24, 2020, Caltrans provided all of the information NMFS requested. NMFS initiated the consultation on January 24, 2020. By email on March 5, 2020, NMFS requested clarification on vegetation removal and provided guidance about fish screen mesh size. The County provided additional information to NMFS by email on March 6, 2020. By email on March 9, 2020, NMFS requested clarification on concrete work and Avoidance and Minimization Measures (AMMs). By email on March 11, 2020, Caltrans confirmed they would incorporate the suggested AMMs as part of their proposed action.

[1] 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. 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.

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 federal funding assistance to the County of San Luis Obispo, Department of Public Works (County) for the replacement of the Dover Canyon Road Bridge at Jack Creek in San Luis Obispo County, California. This safety improvement project will replace the existing bridge with a bridge that has the structural integrity to carry fully loaded emergency vehicles and to improve access to the public and properties served by Dover Canyon Road.

The existing 95-year-old, single-lane bridge will be removed and replaced with a new concrete, two-lane bridge. The bridge is located where Dover Canyon Road crosses Jack Creek in rural Paso Robles, San Luis Obispo County, California, just south of the confluence of the east-west trending Jack Creek and the north-south trending Summit Creek. The project area is in a rural environment with the primary land uses being open space and rural residential estates. To enable continuous access for local residents, a detour bridge located approximately 12 feet north of the existing bridge, will be installed. The detour bridge will veer off the existing roadway, free-span the creek using a standard temporary railcar bridge (approximately 62 feet long and 9 feet wide), and then rejoin the roadway. The area used for construction staging will be approximately 0.71 acres of unused, uncultivated and undeveloped field.

The existing bridge is a single-span, simply supported, steel Warren pony truss with steel floor beams and a timber deck. The structure is founded on concrete spread footing abutments and is 63 feet long by 16 feet wide, with a clear width of 15.75 feet between the bridge rails. The new bridge is proposed to be a single-span precast, pre-stressed concrete slab unit bridge slightly longer than the existing bridge. The replacement structure will be approximately 79 feet long, and align the abutments with the approximate existing top of bank. The proposed structure will be approximately 26 feet wide to accommodate two nine-foot lanes, two-foot shoulders, and barriers. The abutments will sit on spread footing foundations with cast-in-drilled-hole piles anchoring them to the bedrock. Rock slope protection (RSP) will be keyed into the scour resistant rock resulting in approximately 50 square feet of permanent impact to the stream channel as removal and replacement of RSP may encroach into ordinary high water mark (OHWM) (Figure 1). Vegetation clearing including the removal of up to 33 native trees will be required.

If surface flows are present within the work area, Jack Creek would be temporarily diverted away from the streambanks starting no earlier than June 15 and ending by October 31. Diversion structures, approximately 160 feet long, will be installed upstream and downstream from the bridge to function as cofferdams diverting flow from the work areas (bridge abutments) to the low flow channel of the creek. The County will most likely use a system of concrete K-rail, washed gravel-filled bags, longitudinal culverts, and impermeable sheet plastic allowing flows to remain within the primary low-flow channel of the creek. Placement of the K-rail will require minor grading and excavation within Jack Creek. The diversion will remain in place during construction activities and will be restored to preexisting conditions upon completion. The diversion will be designed to completely isolate the work area form the wetted channel. If surface flow is present within the work area after the diversion is installed or if groundwater is

encountered during construction, the County will conduct dewatering activities. This will be accomplished by pumping the water from inside the diversion confines. Pumps will be fitted with appropriately sized protective screens at intake ends to prevent fish and other aquatic species form entering the pumps. Water will be pumped to a temporary sediment basin or to adjacent uplands to capture waterborne sediment before being discharged at a location downstream of the dewatered area. Sediment trapped in the basin will be incorporated into the backfill of the abutments or removed from the action area. The proposed action will result in approximately 5,100 square feet of temporary impact to the creek channel during one construction season (Figure 1).

Figure 1. Jurisdictional Waters Impact Map

Avoidance and Minimization Measures (AMMs) outlined in the BA (Caltrans 2019) are included in the proposed action. The AMMs include the following:

a. Construction activities within S-CCC steelhead critical habitat will be restricted to the dry season (generally June 15 through October 31) when flows are at annual lows.
b. During in-stream work, a NMFS approved biologist will monitor placement and removal of any stream diversion/dewatering and any capture or relocation of steelhead. A record of the number of steelhead observed and/or relocated will be provided to NMFS.
c. If pumps are needed to dewater the site, intakes will be completely screened to

prevent steelhead and other sensitive aquatic species from entering the pump system. The pumps will be checked daily, at a minimum, to ensure a dry work environment and minimize adverse effects to aquatic species and habitats.

d. Erosion control measures (e.g., silt fencing, fiber rolls, and barriers) will be utilized as necessary to prevent erosion and sedimentation in jurisdictional areas. Use of synthetic plastic mesh products is prohibited. The contractor will also apply adequate dust control techniques, such as site watering, during construction to protect water quality.
e. All personnel will participate in an environmental awareness training program conducted by a qualified biologist. A description of steelhead and its critical habitat and avoidance and minimization measures to be implemented during the project will be included.
f. A Storm Water Pollution Prevention Plan will be implemented for the Project to avoid and minimize erosion and storm water pollution in and near the work area prior, during, and after construction activities.
g. Cleaning and refueling of equipment and vehicles will occur only within a designated staging area at least 60 feet (20 meters) from wetlands or other aquatic areas.
h. Prior to construction, sturdy high-visibility fencing will be installed to protect the jurisdictional area adjacent to designated work areas so effects to the adjacent habitats are avoided.
i. Caltrans and the County will ensure a plan is in place for and train workers on prompt and effective response to any accidental spills.

A Habitat Mitigation and Monitoring Plan that provides for 1:1 restoration for temporary impacts and a 3:1 ratio for permanent impacts is outlined in Appendix F of the BA (Caltrans 2019). There will be 0.11 acres of permanent impacts and 2.74 acres of temporary impacts including developed areas such as the road, bridge and other paved surfaces. The project will also require the removal of up to 33 native trees with diameter breast height (DBH) ranging from 6 to 60 inches. The trees slated for removal will primarily be located where the bridge abutments are widened and for equipment access. Replanting of riparian trees, removal of invasive species and a five year monitoring program will be implemented to achieve 80 to 85 percent riparian cover within that timeframe.

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

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

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

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 as a whole for the conservation of a listed species" (50 CFR 402.02).

The designation(s) of critical habitat for (species) use(s) the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a ''destruction or adverse modification'' analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not change the scope of our analysis and in this opinion we use the terms "effects" and "consequences" interchangeably.

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

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

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

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 and the biological assessment for this project. 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.

There were limitations in the information available for this assessment. Historical S-CCC steelhead survey data in the action area or surrounding streams is not available. This assessment relied on stream and hydrological characteristics, anecdotal observations from fisheries biologists familiar with the action area and incomplete survey data from sub-populations within the Interior Coast Range Biogeographic Population Group (BPG) of the S-CCC steelhead distinct population segment (DPS).

2.2 Rangewide Status of the Species and Critical Habitat

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

Threatened South-Central California Coast (S-CCC) Steelhead DPS
(*Oncorhynchus mykiss*)
Listing Determination (71 FR 834, January 5, 2006)
Critical Habitat Designation (70 FR 52488, September 2, 2005).

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 5248) 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 *Steelhead General Life History*

Steelhead are the anadromous form of *O. mykiss*, spawning in freshwater and migrating to marine environments to grow and mature. Steelhead have a complex life history that requires successful transition between life stages across a range of freshwater and marine habitats (i.e.

egg-to-fry emergence, juvenile rearing, smolt outmigration, ocean survival, and upstream migration and spawning.). Steelhead exhibit a high degree of life history plasticity (Shapovalov and Taft 1954; Thrower et al. 2004; Satterthwaite et al. 2009; Hayes et al. 2012). The occurrence and timing of these transitions are highly variable and generally driven by environmental conditions and resource availability (Satterthwaite et al. 2009; Sogard et al. 2012).

Steelhead are divided into two ecotypes based on timing and state of maturity when returning to freshwater: summer-run and winter-run. Winter-run steelhead are the most common ecotype and are the only ecotypes that occur in the S-CCC steelhead DPS. Winter-run steelhead enter natal streams as mature adults with well-developed gonads. They typically immigrate between December and April and spawn shortly after reaching spawning grounds (Shapovalov and Taft 1954; Moyle et al. 2008).

Adult steelhead spawn in gravel substrates with low substrate embeddedness and suitable flow velocities. Females lay eggs in nests, called redds, where they are quickly fertilized by males and covered. Egg survival depends on oxygenated water circulating through the gravel, facilitating gas exchange and waste removal. Adults typically select spawning sites in pool-riffle transition areas with gravel cobble substrates between 0.6 to 10.2 cm diameter and flow velocities between 40-91 cm/s (Smith 1973; Bjornn and Reiser 1991). Eggs incubate in redds for approximately 25 to 35 days (Shapovalov and Taft 1954). Incubation time depends on water temperature, with warmer temperatures leading to lower incubation periods due to increased metabolic rates. Eggs hatch as alevin and remain buried in redds for an additional two to three weeks until yolk-sac absorption is complete (Shapovalov and Taft 1954). Optimal conditions for embryonic development include water temperatures between 6 and 10°C, dissolved oxygen near saturation, and fine sediments less than 5% of substrate by volume (Bjornn and Reiser 1991; USEPA 2001).

Upon emerging from redds, juvenile steelhead occupy edgewater habitats where flow velocity is lower and cover aids in predator avoidance. Rearing juveniles feed on a variety of aquatic and terrestrial invertebrates. As they grow, juveniles move into deeper pool and riffle habitats where they continue to feed on invertebrates and have been observed feeding on younger juveniles (Chapman and Bjornn 1969; Everest and Chapman 1972). Juveniles can spend up to four years rearing in freshwater before migrating to the ocean as smolts, although they typically spend one to two years in natal streams (Shapovalov and Taft 1954; Busby et al. 1996; Moyle 2002).

Successful rearing depends on stream temperatures, flow velocities, and habitat availability. Preferred water temperature ranges from 12 to 19°C and sustained temperatures above 25°C are generally considered lethal (Smith and Li 1983; Busby et al. 1996; Moyle 2002; McCarthy et al. 2009). In central California streams, juvenile steelhead are able to survive peak daily stream temperatures above 25°C for short periods when food is abundant (Smith and Li 1983). Response to stream temperatures can vary depending on the conditions to which individuals are acclimated, however, consistent exposure to high stream temperatures results in slower growth due to elevated metabolic rates and lower survival rates overall (Hokanson et al. 1977; Busby et al. 1996; Moyle 2002; McCarthy et al. 2009).

Juveniles undergo behavioral, morphological, and physiological changes in preparation for ocean entry, collectively called smoltification. Juveniles begin smoltification in freshwater and the

process continues throughout downstream migration with some smolts using estuaries for further acclimation to saltwater prior to ocean entry (Smith 1990; Hayes et al. 2008). Juveniles typically will not smolt until reaching a minimum size of 160 mm (Burgner et al. 1992). Smoltification is cued by increasing photoperiod and downstream migration typically occurs from April to June when temperature and stream flows increase. Stream temperatures influence the rate of smoltification, with warmer temperatures leading to more rapid transition. Preferred temperatures for smoltification are between 10 and 17°C with temperatures below 15°C considered optimal (Hokanson et al. 1977; Wurtsbaugh and Davis 1977; Zedonis and Newcomb 1997; Moyle 2002; Myrick and Cech 2005). In coastal systems with seasonal lagoons, smolts may take advantage of higher growth potential in productive lagoon habitats before ocean entry (Osterback et al. 2018).

Adult steelhead are known to be highly migratory during ocean residency but little is known of their habitat use and movements. They have been observed moving north and south along the continental shelf, presumably to areas of high productivity to feed (Barnhart 1986). Adults will typically spend one to two years in the ocean, feeding and growing in preparation for spawning (Shapovalov and Taft 1954; Busby et al. 1996). Upstream migration typically begins once winter rains commence and stream flows increase. For coastal systems with seasonal freshwater lagoons, winter storms are required to breech the sandbars and allow access to upstream spawning sites. Unlike most congenerics, steelhead are iteroparous, meaning they can return to spawn multiple times. Adult steelhead may spawn up to four times in their lifetime, although spawning runs predominantly consist of first-time spawners (~59%)(Shapovalov and Taft 1954). The maximum life span of steelhead is estimated to be nine years (Moyle 2002).

2.2.2 Status of S-CCC Steelhead DPS

In this opinion, we assess 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 quantitatively, we have 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 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).

Recent 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.[2] 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 S-CCC steelhead DPS has four Biogeographic Population Groups (BPG) designated based on geography and physical attributes within the watersheds unique to each group (NMFS 2013). The sub-populations in the Pajaro River and Salinas River watersheds, which are located in the Interior Coast Range BPG, 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 persistently 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). Additionally, 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). The systematic threats of loss, degradation, simplification and fragmentation of habitat have remained a barrier to recovery though some individual site-specific threats may have been reduced or eliminated as a result of conservation actions since the last status review. S-CCC steelhead habitat quantity and quality has been impacted by several factors including: alteration of streambank and channel morphology; alteration of ambient storm water temperatures; elimination of spawning and rearing habitat; and elimination of downstream recruitment of spawning gravels and large woody debris. In addition, a loss of approximately one third of estuarine habitat has occurred across the S-CCC DPS (NMFS 2013). 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 DPS as threatened under the ESA on January 5, 2006 (71 FR 834). Additional information on S-CCC 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), NMFS Southwest Fisheries Science Center (SWFSC) reports (Boughton et al. 2006; Boughton & Goslin 2006; NMFS 2007), and NMFS' recovery plan (NMFS 2013). New and additional information available since Good et al. (2005) has been summarized in the 2011 and 2016 five-year status review updates (Williams et al. 2011; NMFS 2016).

The S-CCC steelhead DPS is particularly vulnerable to climate change being that they are in the southern extent of the species range and subject to higher mean temperatures in early life-stages. During the last status review, California experienced well below average precipitation (2012-

[2] NMFS defines a viable salmonid population as "an independent population of any Pacific salmonid (genus *Oncorhynchus*) that has a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100- year time frame" (McElhany *et al.* 2000, p. xiii).

2015), record high surface air temperatures (2014-2015) and record low snowpack in 2015 (NMFS 2016). Anomalously high surface temperature resulted in a "hot drought", in which high surface temperatures substantially amplified annual water deficits during the period of low precipitation (NMFS 2016). This affected the S-CCC DPS and critical habitat in adverse ways including; depleted ground water basins essential for over-summer flows; reduced hydrological connectivity in seasonal streams resulting in stranding and mortality; delayed or reduced breaching time of sandbars at the mouth of coastal estuaries resulting in reduced water quality; restricted emigration of juveniles and immigration of adults to spawning grounds; and over summer temperatures that are sub-lethal or lethal resulting in reduced growth and higher prevalence of disease or ultimately resulting in mortality (NMFS 2016).

Current population information on S-CCC steelhead DPS remains limited domain wide and does not suggest an appreciable change in either direction. Within the domain, the sole Carmel River population is the only population for which there has been a time-series of adult abundance longer than 20 years (NMFS 2016). Annual monitoring occurred at the San Clemente Dam which has since been removed (2016) opening up approximately 25 additional miles of spawning habitat. Prior to the dam removal, there had been a consistent long-term decline in numbers over the past 20 years (1996-2015) with an average decline of 16.5% per year. This restoration event will be the subject of ongoing monitoring and investigation on steelhead population viability. An extended drought, occurring during the latest status review, and lack of comprehensive monitoring, has limited the ability to fully assess the status of individual populations and the DPS as a whole. The two most recent status updates conclude that the S-CCC steelhead DPS remain "likely to become endangered in the foreseeable future", and in 2011 and 2016 NMFS chose to maintain the threatened status of the S-CCC steelhead DPS (76 FR 76386, 81 FR 33468).

2.2.3 Status of S-CCC Steelhead Critical Habitat

NMFS considered the following requirements in designating critical habitat for the S-CCC steelhead DPS: 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 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)). NMFS also focused on PBFs and/or essential habitat types within the designated area that are essential to the conservation of the species and that may require special management considerations or protection (81 FR 7214).

PBFs for S-CCC steelhead critical habitat and their essential features within freshwater include:

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) (Figure 2). 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.

Figure 2. SCCC DPS boundaries and core watersheds. (NMFS 2016)

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 corridors, 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.

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

Of the watersheds in the S-CCC steelhead DPS historically supporting steelhead, most continue to support runs, although run sizes are significantly reduced, or no longer exist in many sub-watersheds that have been blocked by dams. A reduced population size causes each individual within the population to be more important and significantly increases the population's susceptibility to catastrophic events. Moreover, low population sizes compromise genetic integrity, posing serious risks to steelhead survival and recovery. The three watersheds most likely exhibiting the largest annual runs (i.e., Pajaro, Salinas, and Carmel rivers) have

experienced declines in adult run size of 90 percent or more (Busby et al. 1996). 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 & Associates 2008) as well as disease and predation, to some degree. Sone of the key factors responsible for decline in the S-CCC steelhead DPS and its critical habitat are discussed in more detail below.

2.2.4.1 *Habitat Alteration*

Habitat destruction and fragmentation have been linked to loss of species biodiversity, increased rates of species decline and increased rate of species extinction (Davies et al. 2001, Augerot and Foley 2005; Rybicki & Hanski 2013). 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.

2.2.4.2 *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 into unscreened or poorly screened diversions; and 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 Salinas dam, in the upper mainstem, blocks passage to pristine habitat in the Los Padres National Forest and alters the natural hydrology through reservoir releases. There are no required flow releases from this dam to maintain flows for S-CCC steelhead habitat and flow is intermittent upstream in the summer months. Critical recovery actions for this Core one population of the Interior Coast Range BPG include developing and implementing operating criteria in the Salinas Dam to help provide essential habitat functions to support the life history and habitat requirements of adult and juvenile steelhead in the Salinas River mainstem. 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, 2007). However, the mainstem remains severely impaired by intensive anthropogenic activities related to agriculture, and residential development and associated water development and management (NMFS 2013).

2.2.4.3 *Estuarine Habitat Loss*

In the Interior Coast Range BPG, 70% of historical estuarine habitat has been lost (Hunt & Associates 2008).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 2013). Estuarine habitat provides a necessary linkage between fresh and salt water habitats. It allows acclimation to sea water for out migrating smolts and provides unique opportunities to allow expression of life history diversity under variable hydrological conditions and temperature profiles (Bottoms et al 2005, Neilson et al. 1985, Hayes et al. 2011). Estuaries have been found to have a more productive environment than upstream in the freshwater rivers that feed into them (Healy 1991, Bond et al 2008. Hayes et al. 2008).

2.2.4.4 *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 2013). 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 2013).

2.2.4.5 *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 can contribute to the spread of some infectious diseases. However, studies have shown that native fish tend to be less susceptible to pathogens than hatchery cultured fish (Buchanan et al. 1983).

Introductions of non-native aquatic species 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 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. Recent surveys have confirmed presence of striped bass in coastal lagoons including the Salinas, Pajaro and Carmel River. It is believed that striped bass have been observed in the lagoons intermittently for decades though it is unlikely that they are actually spawning in local rivers. Little is currently known as to the impact they may have on native S-CCC steelhead populations and common prey species (Casagrande 2011). However, striped bass are a top predator of salmonids in other watersheds, particularly when in combination with habitat alteration or degradation (Sabal et. al. 2016).

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.

2.2.4.6 *Global Climate Change*

Climate change poses a potential threat to long-term survival and recovery of salmonids. Climate projections for central California indicate an increased intensity in the climate patterns that characterize a semi-arid Mediterranean climate, namely increased intensity of periodic droughts and cyclonic rainstorms (NMFS 2013). In California, over the last century, sea levels have risen by as much as seven inches along the coast. The state has also seen increased temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snowmelt and rainwater running off sooner in the spring (IRWM 2018). This would lead to added stress on salmonid populations that are already faced with lethal and sub-lethal temperature profiles in spawning and rearing streams throughout California. There is no clear trend in annual precipitation; however, precipitation records suggest wet and dry years are increasing in intensity (Coats 2010; Kadir et al. 2013). These trends may ultimately lead to changes in hydrology, water management regimes, and shifts in salmonid life history. NMFS believes that the effects of changing climate on salmonids thus far has been

limited and that landscape-level anthropogenic disturbance has a higher impact on steelhead abundance.

Climate models predict observed trends will continue into the future, potentially impacting steelhead across a range of habitats. According to the California Department of Water Resources, more climate changes can be expected by the year 2050 and on to the end of the century: California's mean temperature may rise 1.5°F to 5.0°F by 2050 and 3.5°F to 11.0°F by the end of the century; average annual precipitation may show little change, but more intense wet and dry periods can be expected with more floods and more droughts; flood peaks will become higher and natural spring/summer runoff will become lower. Global sea level projections suggest possible sea level rise of approximately 14 inches by 2050 and a high value of approximately 55 inches by 2100 (IRWM 2018). Although no clear trend in precipitation has been observed thus far, precipitation is expected to decrease across most climate regions (Moser et al. 2012; Diffenbaugh et al. 2015). This increased heat and decrease in precipitation is projected to lead to more frequent and intense wildfires across the region (Moser et al. 2012; Gergel et al. 2017). Increased wildfires may lead to subsequent runoff from burned lands, increasing sedimentation in streams and reducing the quality and quantity of spawning habitat. In addition, changes in ocean circulation, temperature and food availability could alter juvenile and adult steelhead bioenergentics and reduce marine survival (Scavia et al. 2002; Feely et al. 2004; Abdul-Aziz 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 where Dover Canyon Road crosses Jack Creek in Paso Robles, San Luis Obispo County, California. The action area comprises 3.82 acres west of the city of Paso Robles in a rural area. Dover Canyon Road is a paved, winding rural road through rolling oak woodland terrain typical of the Santa Lucia Mountain Range (Figure 3). Jack Creek is a small, undeveloped mountainous stream that conveys water seasonally. The immediate proposed action area is sparsely populated with the primary land uses being open space and rural residential estates. The Dover Canyon Road Bridge crosses over Jack Creek just south of the confluence of Summit Creek with Jack Creek.

The action area encompasses all areas of potential ground disturbance (including staging areas) and includes the existing bridge and 0.12 acres of stream channel habitat, including the diversion zones 160 feet upstream and downstream from the bridge. Jack Creek is designated S-CCC steelhead critical habitat. The following acreage of affected plant communities and habitat are listed in Table 2 and Figure 3.

Table 2. Plant Community/Habitat Present within the Action Area

Plant Community/Habitat	Total Acres within Action Area
Annual Brome Grassland	2.12
Valley Oak Woodland	0.55
Arroyo Willow Thicket	0.30
Stream Channel[1]	0.12
Developed/Paved	0.72
Total	**3.82**

[1] Delineated by OHWM.

Figure 3. Vegetation Communities in the Action Area.

2.4 Environmental Baseline

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

2.4.1 General Watershed Description

The action area is located within the Paso Robles Creek sub-watershed, which is within the larger Paso Robles Creek-Salinas River Watershed (Hydrologic Unit Code (HUC):1806000504). The Paso Robles Creek-Salinas River Watershed encompasses approximately 143,654 acres in northern-central San Luis Obispo County and includes a portion of the Salinas River and adjacent tributaries. Upper Paso Robles Creek and its tributaries are steep pre-Quaternary non-infiltrative headwaters with steep, moderately infiltrative early to mid-tertiary valleys (SLO Watershed Project 2019). There are no dams or water impoundments on most of these mountainous creeks.

The action area occurs on Jack Creek, just south of the confluence of Jack Creek with Summit Creek (Figure 3). Both Jack Creek and Summit Creek are intermittent streams that convey water seasonally. Jack Creek flows into Paso Robles Creek about three miles southeast of the action area, and Paso Robles Creek flows into the Salinas River at river mile (RM) 128, which drains north-westerly towards the Pacific Ocean. The upper Salinas River is controlled by the Salinas Dam (RM 154) which forms Santa Margarita Lake and flow is intermittent in the summer months. Some sections of the Salinas River maintain perennial flow. Below the confluence with the Nacimiento River (RM 108), which is approximately twenty river miles downstream (north) of the action area, summer flows are maintained by agricultural runoff and water releases from the San Antonio and Nacimiento Reservoirs into the mainstem Salinas. However, in most years the Salinas River does not maintain perennial flow in the lower mainstem as it winds through heavily populated urban areas and intensively farmed agricultural lands.

Major threats to the Salinas River populations include water diversion and impoundment related to residential and agricultural development (NMFS 2013). Summer water releases from San Antonio and Nacimiento reservoirs result in a reverse hydrograph, meaning the highest continuous flows occur in summer rather than winter. A large seasonal dam and diversion structure downstream impounds these releases, providing surface water for agriculture. These facilities alter the timing, magnitude, and duration of flows throughout the lower Salinas River.

In the upper Salinas River, the Salinas Dam impounds water degrading or eliminating flows that may affect migration to/from the upper tributaries including Jack Creek. Agricultural development of riparian corridors has led to a reduction of channel complexity and groundwater 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. Recovery actions prescribed by NMFS (2013) to address impairments in the Salinas River include modifying impediments to allow fish passage and improving substrate quality by managing instream mining operations.

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 2.2.4.6 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; Kadir et al. 2013;Westerling et al. 2011). In future years and decades many of 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 in the Action Area

Jack Creek is part of the upper Salinas River population, which is part of the S-CCC steelhead Interior Coast Range Biogeographic Population Group (BPG). The Interior Coast Range BPG region is the largest of the four BPGs in the S-CCC steelhead Recovery Planning Area and includes the east-facing slopes of the Central Coast Ranges (Santa Lucia Mountains and Santa Cruz Mountains) and the west-facing slopes of the Inner Coast Range (Diablo, Gabilan, Caliente, and Temblor ranges). This region extends 180 miles across the length of the S-CCC Steelhead Recovery Planning Area and includes portions of Santa Clara, San Benito, Monterey, and San Luis Obispo counties. This BPG consists of two major watersheds, the Pajaro River and Salinas River, which flow into the Pacific Ocean at Monterey Bay. The Salinas River steelhead run is 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). There is insufficient data to estimate adult steelhead population size in the Salinas River and estimates of steelhead abundance and density in the action area are also lacking. Based on historic estimates, recent observations, and known impairments in the watershed, the Salinas River population is recognized as having experienced significant declines from historic conditions (NMFS 2013). The Monterey County Water Resource Agency (MCWRA) had conducted adult steelhead escapement and juvenile steelhead monitoring in the Salinas River from 2011 through 2014. Adult escapement, estimated from Salinas River weir fish counts (RM 2.5), was below 55 each year from 2011 to 2013 and in 2014 no adult steelhead were identified in the weir (MCRWA 2014b). These are considered conservative numbers since migration could have occurred prior to weir installation and not all fish passing through the weir were able to be identified.

Juvenile steelhead surveys and outmigration monitoring suggest the highest abundance of steelhead in the Salinas River population are in the Arroyo Seco (RM 50) while a small, intermittent run persists in the Nacimiento River (RM 108) (MCRWA 2012, 2013, 2014a, 2014c). The Salinas River S-CCC population is largely sustained by the high quality spawning and rearing habitat in the Arroyo Seco River. Rotary screw trap (RST) sampling in the Salinas River, downstream of the Nacimiento confluence, captured between one and nine juvenile steelhead during deployments between 2010 and 2012 (MCWRA 2014a). Similarly, RST sampling in the Nacimiento River, near the confluence with the Salinas River, captured between one and seven juveniles during deployments between 2012 and 2014 (MCWRA 2014a). Capture efficiency tests revealed very low efficiency at the Nacimiento and Salinas River RST sites and it is likely more fish were present than were captured by the RST (MCRWA 2014a). Dive surveys of four sites distributed along the length of the Nacimiento River below the Nacimiento Dam produced the following density estimates: 0.0, 1.11, 3.13 and 5.93 juvenile steelhead per 100 stream feet (MCWRA 2014c). The consistent presence of juvenile steelhead downstream of the action area and the limited surveys conducted in the Paso Robles Creek-Salinas River Watershed indicate the possibility for steelhead to be present in the action area prior to and during construction.

S-CCC steelhead are most likely to occur in the action area during high flow events in the winter and early spring when spawning migration and smolt migration are at their peaks. However, although Jack Creek is designated critical habitat for S-CCC steelhead, there are no recently reported occurrences of this species within Jack Creek or within five miles of the action area (CNDDB 2019). Anecdotal reports of adult sightings in Jack Creek and e-fishing of juveniles in Paso Robles Creek occurred in the 1990's (D. Highland personal communication) when flow conditions were suitable.

2.4.3 Status of Critical Habitat within the Action Area

The action area is largely confined to the stream channel and banks of Jack Creek underneath the Dover Canyon Bridge including 160 feet upstream and downstream from the bridge. Jack Creek is S-CCC steelhead designated critical habitat. Essential features of critical habitat include substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, space, and safe passage conditions.

The action area is subject to a Mediterranean climate with hot and dry summer seasons and light to moderate precipitation during the cooler winter months. The majority of the precipitation falls between December and March. The soils within the stream channel below the ordinary high water mark (OHWM) consist of gravel and cobble, with a few boulders. The area above the OHWM was predominantly containing or resembling clay. The vegetation in the upland area consists of annual brome (non-native) grassland and valley oak woodland while near stream in the action area, the primary vegetation is arroyo willow thicket.

Historical United States Geological Survey (USGS) stream gauge records from 1949 through 1978 show that Jack Creek often runs dry during the summer and fall months (Table 3). The nearest USGS gauge currently recording flows in the watershed occurs on the Salinas River at Paso Robles where there is also intermittent flow from July through October (USGS 11147500).

Table 3. Historical Monthly Mean Flows at Jack Creek (USGS 11147000)

Jack Creek	Monthly Mean cubic feet per second (cfs) (Calculation Period: 1949-10-01 through 1978-08-31)											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(cfs)	49	47	29	18	3.8	1.0	0.24	0.04	0.0	0.0	3.3	21
Years without monthly flow	0/29	0/29	0/29	0/29	0/29	0/29	8/29	16/29	22/29	27/29	17/29	4/29

Source: USGS (nwis.waterdata.usgs.gov)

Jack Creek is hydrologically connected to the Salinas River via Paso Robles Creek. In order for anadromous *O. mykiss* to complete their life cycle in Jack Creek, they would need to migrate through the Salinas River as adults and then juveniles. Because portions of the Salinas River run dry during the year, it becomes a migration barrier and/or could create stranding and lethal temperatures during rearing or migration for S-CCC steelhead. A San Luis Obispo County Regional Instream Flow Assessment concluded Jack Creek does not carry sufficient flows to provide steelhead habitat year round (Stillwater Sciences, 2014). The assessment relied on the

historical stream gauge flows that ended in 1978. However, stream gauge data in the vicinity indicates that hydrology in the area is prone to intermittent flows due to the Mediterranean climate in the region and water impoundment and diversions in the adjacent Salinas River. As of April, the Salinas River at Paso Robles daily mean discharge during the winter of 2020 was at or near 0 cfs (Figure 4.), precluding adult steelhead spawning in Jack Creek. However, spring precipitation was higher than average resulting in flashy flows in April, making it possible for late arriving spawners to access Jack Creek. Additionally, older juveniles may have opportunistically sought rearing in upstream areas such as Jack Creek if hydrologic connectivity occurred during March and April and could be present when construction activities occur in the summer of 2020.

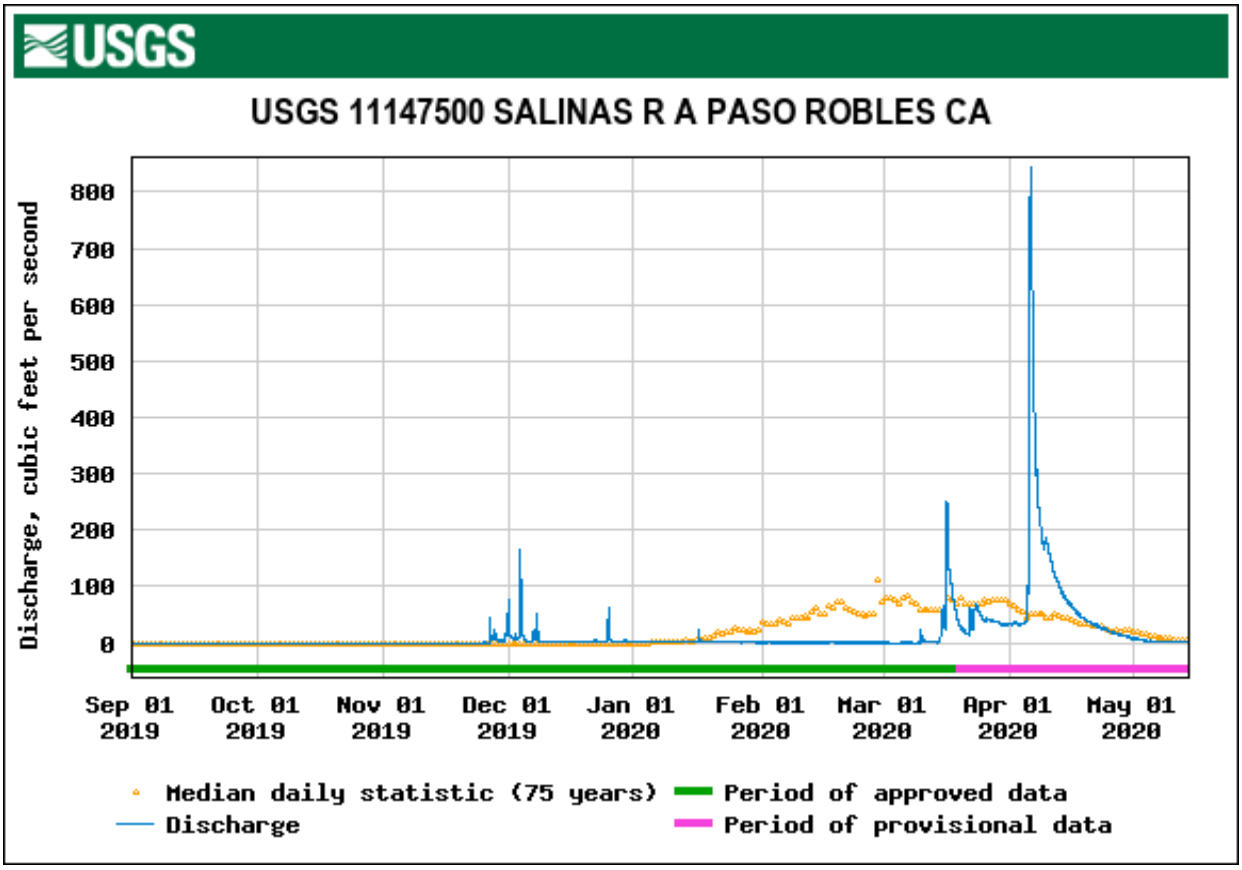

Figure 4. Daily Discharge at Salinas River at Paso Robles during the S-CCC Steelhead Migration Window.

2.5 Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved

in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

The effects of the proposed action are reasonably likely to include: adverse effects to S-CCC steelhead from fish collection, relocation and from temporary dewatering of the project site; insignificant effects to steelhead and critical habitat will occur from temporary increases in suspended sediments; temporary reductions in riparian vegetation and cover; a minor increase in streambank hardening; and limited potential for fish to be exposed to hazardous materials and contaminants. Although some of these effects are insignificant, they are considered and addressed in the remainder of this analysis, particularly the Integration and Synthesis portion of this biological opinion.

2.5.1 Fish Collection and Relocation.

Fish collection and relocation will be performed in coordination with dewatering prior to construction activities on the stream bank for the Dover Canyon Bridge. Fish collection and relocation are proposed to avoid fish stranding and exposure to construction activities. Before and during dewatering of the creek channel, S-CCC steelhead and other native fish will be captured by a qualified fisheries biologist using dip nets. A relocation site, based on a stream habitat assessment survey, has been located approximately 500 feet upstream of the Dover Canyon Road Bridge. The proposed relocation area is the largest and deepest pool habitat in the project vicinity, yet outside of the project construction action area. However, due to the intermittent nature of Jack Creek and the seasonally low or absent flow during the work window, it is anticipated that S-CCC steelhead will not be found within the construction area during dewatering activities. In the event that steelhead are encountered during dewatering activities, the identified upstream relocation pool is the most suitable habitat available for steelhead within the area.

Steelhead relocation activities will occur outside the adult migration and spawning season, during the summer low-flow period after emigrating smolts and kelts (post-spawned adults) have left the creek (June 15 through October 31). Therefore, NMFS expects the S-CCC steelhead that may be captured and relocated will be limited to young-of-the-year and pre-smolting juveniles. Data to quantify the anticipated number of steelhead in the action area are not available, but estimates can be derived from juvenile steelhead monitoring that was conducted in the Nacimiento River, tributary to the Salinas River, located downstream from the action area.

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 and mortality attributable to fish capture varies widely, depending on the method used, the ambient conditions, and the expertise and experience of the field crew. Because fish relocation activities will be conducted by qualified fisheries biologists, direct effects to and mortality of juvenile steelhead during capture will be minimized.

Although sites selected for relocating fish should have similar water temperature as the capture sites and are expected to have adequate habitat available, in some instances relocated

fish may endure short-term stress from crowding at the relocation sites. Relocated fish may have to contend with other fish causing increased competition for available resources such as food and habitat area. Frequent responses to crowding by steelhead include emigration and reduced growth rates (Keeley 2003). Some of the fish released at the relocation sites may choose not to remain in these areas and move either upstream or downstream to areas that have more vacant habitat and a lower density of steelhead. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. NMFS does not expect impacts from increased competition would be large enough to adversely affect the survival chances of individual steelhead, or cascade through the watershed population based on the small area that would likely be affected and the relatively small number of individuals likely to be relocated (particularly when compared with the remainder of individuals throughout the drainage not affected by the project). As described above, sufficient habitat is available in Jack Creek to sustain relocated steelhead without crowding other juvenile steelhead.

To estimate the number of juvenile steelhead that may be present in the action area, we used data from MCWRA survey and monitoring efforts in the Salinas and Nacimiento rivers, which provide the most recent estimates of juvenile steelhead densities in the vicinity of the action area (Section 2.4.2). S-CCC juvenile population estimates were conducted by dive surveys in the Nacimiento River at four river reaches in 2014. These sites are approximately 20 miles downstream from the action area and are located where flows for S-CCC steelhead outmigration are regulated by the Nacimiento Dam. Although the hydrology and habitat differ from conditions in Jack Creek, it provides recent data to provide an estimate of potential S-CCC populations in the action area. Since multi-year average densities are unavailable, we have opted to use the average of the most recent observed density, which is 2.5 fish per 100 feet of stream (MCWRA 2014c).

Data on fish relocation efforts since 2004 shows most mortality rates are below three percent for steelhead (Collins 2004, CDFG 2005, 2006, 2007, 2008, 2009, 2010). Fish that avoid capture during relocation efforts may be exposed to risks described in the following section on dewatering. NMFS expects two percent of steelhead will be harmed or killed during fish capture and relocation activities. This results in no more than one[3] steelhead expected to be harmed or killed during relocation efforts.

Fish that avoid capture during relocation effects may be exposed to risks described in the following section on dewatering.

2.5.2 Project Site Dewatering

The project will require 320-linear-feet of dewatering using approximately 160-foot K-rails placed above and below the bridge, along each bank and running parallel to the direction of flow. The K-rails will narrow the channel, keeping water out of the work area which will extend a minimum of two feet from the proposed rock slope protection (RSP). If surface flow is present

[3] Up to eight steelhead are estimated to be present within the area to be dewatered (320 linear feet x 2.5 fish/100 feet). If two percent of those fish die it would result in 0.16 fish killed (0.02 mortality rate x 8 fish) during fish handling and relocation activities. Rounding this yields an estimate of one steelhead mortality.

within the work area after the diversions are installed or if ground water is encountered during construction, the County will conduct dewatering activities by pumping the water from within the diversion confines. Pumps will be fitted with appropriately sized protective screens at the intake ends to prevent fish and other aquatic species from entering the pumps. Water will be pumped to a temporary sediment basin or to adjacent uplands to capture waterborne sediment before being discharged at a location downstream of the dewatered area.

Based on historical summer flow records, average Jack Creek flows are expected to be approximately 1.1 cfs between June and October. The creek is often intermittent or dry in the late summer and fall months (Table 3), but flow is likely to be present during the beginning of the work window. Any streamflow in Jack Creek will remain in the low flow channel of the streambed during construction activities.

Isolation and dewatering of the construction area is expected to cause temporary loss, alteration, and reduction of critical habitat, and may result in mortality of any salmonids that avoid capture during fish relocation activities. Any remaining juvenile steelhead within these work areas may be harmed by concentrating or stranding them in residual wetter 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 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. Only one dewatering event is expected to occur during project construction. Based on this, NMFS estimates that up to one[4] juvenile steelhead mortality may occur as a result of being missed (not captured) during dewatering activities and left in the construction area.

Dewatering operations may also affect S-CCC steelhead prey. Benthic (bottom dwelling) aquatic macroinvertebrates, an important food source 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 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 through the work sites in the low flow channel. The temporary loss of approximately 320-linear-feet of instream habitat at Jack Creek is not expected to impair designated critical 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 water diversion structures in the action area are not expected to impact steelhead outside the dewatered

[4] Up to 8 steelhead are estimated to be present within the area to be dewatered (320 linear feet x 2.5 fish/100 feet). If one percent of those fish die it would result in 0.08 fish killed (0.01 mortality rate x 8 fish) from becoming stranded after dewatering activities. Rounding this yields an estimate of one steelhead mortality.

area. Dewatering will occur for a limited duration and the dewatered area will be relatively small compared to the habitat within the Jack 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. Additionally, dewatering will mimic the natural seasonal dewatering timeframe, so it is not expected to disturb the natural food web processes in the action area. Based on the foregoing, individual steelhead are not anticipated to be exposed to a reduction in food sources, nor will PBFs of critical habitat be degraded from the minor and temporary reduction in aquatic macroinvertebrates as a result of dewatering activities. Thus, dewatering is expected to have negligible effects on steelhead and critical habitat.

2.5.3 Increased Suspended Sediment Concentrations

Construction activities at the Dover Canyon Road Bridge may result in minor disturbances to the stream bed and banks for equipment access, construction activities, and placement/removal of stream diversion structures. Disturbed soils may become mobilized when the site is re-watered following construction and during subsequent high flow events. NMFS anticipates these activities would affect water quality and critical habitat in the action area in the form of small, short-term increases in turbidity during re-watering and subsequent higher flow events during the first winter storms post-construction. Instream and near-stream construction activities have been shown to result in temporary increases in turbidity (reviewed in Furniss et al. 1991; Reeves et al. 1991; Spence et al. 1996).

Increases in sediment may affect steelhead and critical habitat in a variety of ways. High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelley 1961; Bjornn et al. 1977; Berg and Northcote 1985), reduce growth rates (Crouse et al. 1981), and increase plasma cortisol levels (Servizi and Martens 1992). High and prolonged sediment concentrations can reduce dissolved oxygen in the water column, resulting in impaired respiration, repressed immune response, and mortality (Sigler et al. 1984; Berg and Northcote 1985; Gregory and Northcote 1993; Velagic 1995; Waters 1995). Even small pulses of turbid water can cause salmonids to disperse form established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation, decreasing survival as a result. Increased sediment deposition can fill pools, thereby reducing available cover and habitat, and smother coarse substrate particles, which can cause a shift in macroinvertebrate composition and abundance (Sigler et al. 1984; Alexander and Hansen 1986).

Although chronic elevated sediment and turbidity levels may affect steelhead and critical habitat, the temporary increases in sedimentation and turbidity resulting from this project are not expected to rise to levels sufficiently high to render such impacts on steelhead or critical habitat. Sedimentation and turbidity are most likely to increase during construction and removal of water diversion structures as well as during post-construction re-wetting of the channel. Caltrans will implement AMMs at each stage of construction to prevent the mobilization of sediments and reduce or eliminate impacts to steelhead and critical habitat. Wattles and silt fences will be placed along access roads, staging areas, and equipment storage areas to filter sediment from runoff; construction mats and gravel will be used in work areas within the streambed to reduce disturbance to the streambed and reduce sediment mobilization during re-wetting. A qualified

biologist will be on-site until all ground-disturbing activities are complete and workers have been trained in compliance with AMMs. Water pumped out of the dewatered construction area will be released into a storage tank for suspended sediment to settle out prior to being released back into the river. With the implementation of AMMs, NMFS anticipates any resulting elevated turbidity levels would be small (within the immediate project footprint to approximately 100 feet downstream) and only occur for a short time. NMFS does not anticipate harm, injury, or behavioral impacts to S-CCC steelhead or the degradation of PBFs of critical habitat from any elevated suspended sediment levels resulting from the project activities.

2.5.4 Temporary Reduction in Riparian Vegetation and Cover

The project will result in temporary reductions in riparian vegetation within portions of the action area due to the removal and trimming of vegetation along the bed and banks of Jack Creek for equipment access and construction. 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 for steelhead. Where riparian vegetation is removed or trimmed, 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.

In the action area of this project, existing riparian vegetation would provide cover and habitat complexity for migrating steelhead adults and rearing juveniles in Jack Creek. However, vegetation is limited under and immediately adjacent to the bridges by existing rock riprap, bridge abutments, and overhead shading by the bridge.

Arroyo willow thicket is dominant on the banks of Jack Creek with understory that includes black elderberry, mulefat and mugwort. Within the stream channel, which includes the active channel and lower floodplain that is seasonally flooded, a total of 0.12 acre of riparian vegetation will be temporarily impacted by project activities. The project will also impact 0.35 acre of valley oak woodland, 28 native trees are anticipated to be removed including valley oak and coast live oak, with DBH ranging from 6 to 60 inches. These trees are in the upland area of Jack Creek but provide riparian canopy above the ordinary high water mark (OHWM). In addition, invasive and non-native understory plants in the work site will be removed where they conflict with project construction.

Post-construction, the project will mitigate for permanent and temporary impacts to jurisdictional areas and restore appropriate native vegetation to disturbed portion of the project site at the following ratios: temporary loss of arroyo willow thicket stream habitat 1:1 (total 0.12 acres); permanent upland riparian habitat 3:1 (total 0.126 acres); temporary upland riparian habitat 1:1

(total 0.32 acres). There is no proposed mitigation for 0.001 acres of permanent area lost within the OHWM due to minor incursion of RSP (~50 square feet).

Revegetation will be performed immediately upon completion of construction activities. Because riparian vegetation typically begins to provide habitat benefits relatively rapidly during reestablishment, usually within the first one to two years following planting, the expected effects to steelhead and their habitat will be temporary. The small temporal loss of vegetation at the work sites are not expected to result in measureable increases in water temperature or reduction in the amount of terrestrial food input into Jack Creek. Thus, the ability of critical habitat to support listed species' conservation needs in the action area will be maintained. Additionally, NMFS does not anticipate harm, injury, or behavioral impacts to S-CCC steelhead associated with exposure to this temporary level of minor reductions in riparian vegetation.

2.5.5 Streambank Hardening

Development in and over channels has the potential to impair stream habitat by fortifying natural streambanks through RSP or other permanent fill. Habitat impairments associated with the existing bridge include: abutments on the streambank that confine the channel and prevent channel migration, and bank stabilization that constrains flow and impairs bed and bank habitat in the immediate area. These constraints have the potential to result in poor habitat complexity, including poor cover and poor refugia. Replacement of the Dover Canyon Road 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 repaired bridge will include a slight increase of in-bank abutments and up to 50 square feet of RSP that may encroach into the OHWM. However the footprint of RSP within Jack Creek, 50 feet within a 25.3 mile span of streambank, will not be a meaningful impact on habitat available within Jack Creek. Water quantity and quality will not be impaired; and no structures will be installed that would cause an obstruction to fish passage. Current conditions in the action area and within Jack Creek, which is an undammed and largely unmodified creek, indicate that riparian cover, substrate, channel complexity and water quality do support PBFs of critical habitat for S-CCC steelhead seasonally when sufficient flow is available. Therefore, the slight increase in RSP is not expected to result in significant impacts to steelhead or critical habitat.

2.5.6 Accidental Release of Toxins or Construction Materials.

Construction operations in, over, and near surface water have the potential to release debris, hydrocarbons, concrete, and similar contaminants into surface waters. Potential construction debris that could result from a project of this type include wet and dry concrete debris, fuel and lubricant for construction equipment, and various construction materials. If introduced into the water, these debris could impair water quality by altering the pH, reducing oxygen concentrations as the debris decompose, or by introducing toxic materials such as hydrocarbons or metals into the aquatic habitat. Oils and similar substances from construction equipment 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).

These effects have the potential to temporarily degrade habitat and injure or kill exposed fish. However, the project includes AMMs to address spills and prevent the introduction of construction materials and debris into the creek. The contractor will prepare an emergency response and cleanup plan that will detail protocols for containing and cleaning any spills prior to beginning construction. Due to these measures, conveyance of toxic materials into the Jack Creek during project implementation is not expected and the potential for the project to degrade water quality and harm S-CCC steelhead and critical habitat is improbable.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.4).

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. The action area is subject to a Mediterranean climate within an intermittent stream. The hydrology within this stream is subject to annual shifts in precipitation coupled with long term effects of climate change. The Salinas River is a highly modified and controlled system that will continue to affect the ability of S-CCC steelhead to complete their lifecycle in mountainous streams in the Paso Robles Creek-Salinas River Watershed. 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.

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.

The Upper Salinas River subpopulation is part of the larger Interior Coast Range BMP, and as noted in Section 2.2.2, Status of S-CCC Steelhead DPS, are in particularly poor condition and exhibit a greater lack of viability than many of the coastal subpopulations. Loss of habitat and

extensive habitat degradation have led to poor conditions throughout the S-CCC recovery domain, including the upper Salinas River. As a result, S-CCC steelhead densities are substantially lower than historic estimates. The Salinas River population is primarily sustained by the high quality spawning and rearing habitat in the Arroyo Seco River and secondly by the Nacimiento and San Antonio rivers. All of these tributaries are many miles downstream (north) of the action area and drain into a section of the Salinas River that has managed flow from reservoir releases. The habitat within Jack Creek is not an important migratory corridor as it is only accessible for spawning or rearing in wetter years, therefore, providing inconsistent opportunities to help sustain the DPS. As noted in Section 2.4.2 Status of Listed Species in the action area, it is unlikely that populations could persist in the upper Salinas River and tributaries under current conditions. This is further evidenced by the lack of steelhead presence in the upper Salinas mainstem (above the Nacimiento River confluence), Paso Robles Creek and Jack Creek. Although there are not dedicated surveys to monitor steelhead presence or abundance, there is evidence that habitat units connecting the upper mainstem to the aforementioned tributaries lack sufficient water velocity to support food delivery or to provide contiguous migration in the spring and summer. Additionally, the likelihood that steelhead will be in the vicinity of Jack Creek is greatly diminished based on timing of construction coinciding with the dry season.

As described in section 2.5 Effects of the Action, NMFS identifies the following as having the potential to adversely affect S-CCC steelhead: fish collection and relocation and dewatering. Therefore, a primary risk assessment is whether the loss of these individuals will reduce appreciably the likelihood of both the survival and recovery of S-CCC steelhead in the wild by reducing its numbers, reproduction, or distribution.

Adverse effects associated with fish collection and relocation, and dewatering, include the potential for injury and mortality of S-CCC steelhead juveniles. However, as described in section 2.4.2. Status of Listed Species in the Action Area, NMFS expects that low numbers of S-CCC steelhead juveniles will be present in the action area to be exposed to this effect, and that few, if any, juveniles may be injured or killed by these activities. Anticipated mortality from relocation is expected to be two 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 8 S-CCC steelhead juveniles are expected to be present within the dewatered reach and only one dewatering event will be required to complete the project, NMFS expects no more than two steelhead juvenile will be harmed or killed during fish collection and relocation, and dewatering (see Section 2.5.1 Fish Collection and Relocation, and Section 2.5.2 Project Site Dewatering). Although the low and intermittent flow conditions in this tributary of the Salinas River make it less probable that juveniles will be present, it follows that the impact of any take relative to this individual population will be higher. However, since the Salinas River population is largely sustained by spawning and rearing habitat in several tributaries north of Jack Creek, any S-CCC steelhead present would represent a small proportion of the Salinas River population overall. Because of the relatively large number of juveniles produced by each spawning pair, the two that may be killed as a result of the proposed activities make it highly unlikely that the potential loss of juveniles in the project site will have lasting impacts. We determined other project activities will result in minor effects to steelhead or the potential effects were improbable. Considering the

above conclusions, the project is unlikely to appreciably reduce the likelihood of survival and recovery of S-CCC steelhead DPS.

As described in Section 2.5 Effects of the Action, the proposed action has the potential to have temporary and permanent impacts to critical habitat in Jack Creek. A total of 0.12 acre of riparian vegetation will be temporarily impacted by project activities. Any riparian vegetation removed during construction will be replanted and established stands of riparian trees will be allowed to remain in place, therefore limiting impacts to riparian function and habitat complexity to the short-term. During this time, due to the small footprint of vegetation removal, NMFS does not expect increases in water temperatures or reductions in prey within the action area. Increased suspended sediment concentrations and the release of toxins and construction materials will be prevented by conducting construction activities during the dry season when flow is normally absent and implementing several AMMs to restore upland and streambank habitat to pre-project conditions. The proposed action will slightly increase hardened bank conditions at the bridge abutments by adding 50 square feet of additional RSP. This will not result in any meaningful change to PBFs within the action area. The slight increase in bank hardening is within the footprint of the already existing hardened bank present resulting in a minor permanent impact. Critical habitat in Jack Creek remains largely unaffected with hydrological conditions conducive to supporting the S-CCC steelhead life cycle remaining the primary limiting factor. The temporary and permanent effects to S-CCC critical habitat from this proposed action are minor and very localized in scale and will not result in adverse modification to S-CCC steelhead critical habitat.

Regarding future climate change effects in the action area, as stated in Section 2.4.1 General Watershed Description, California could be subject to higher average summer air temperatures and lower total precipitation. Higher air temperatures would likely lead to warmer stream temperatures. Reductions in the amount of precipitation would reduce stream flow levels in Northern and Central Coast rivers. Estuaries may also experience changes in productivity due to changes in freshwater flows, nutrient cycling, and sediment amounts. For this project, construction would be completed in 2020 and the above effects of climate change are unlikely to be detected within that timeframe. The short-term effects of project construction would have completely elapsed prior to these climate change effects.

As described in the Cumulative Effects section of this opinion (Section 2.6), 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. Recovery actions for the Salinas River population include prescribing flow releases in the upper Salinas River to help facilitate completion of S-CCC steelhead lifecycles. In absence of implementation of recovery actions that could beneficially impact Salinas River S-CCC steelhead populations, NMFS expects reservoir operations and water withdrawals will continue to alter the hydrology and negatively affect aquatic habitat and S-CCC steelhead. Therefore, 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.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of

other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of S-CCC steelhead DPS or destroy or adversely modify its designated critical habitat.

2.9 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "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

The amount or extent of take described below is based on the analysis of effects of the action done in the preceding biological opinion. If the action is implemented in a manner inconsistent with the project description provided to NMFS, and take of a listed species occurs as a result, such take would not be exempt from section 9 of the ESA. In this biological opinion, NMFS determined that incidental take would occur as follows:

Take of listed S-CCC steelhead may occur during fish relocation and dewatering in a 320-linear-foot reach of the project site between June 15 and October 31. The number of threatened S-CCC steelhead that may be incidentally taken during project activities is expected to be small and limited to the juvenile life history stage. NMFS expects that no more than two percent of the fish within the 320-linear-foot dewatering area of will be injured, harmed, or killed during fish capture and relocation. NMFS also expects that no more than one percent of the fish within the 320-linear-foot dewatering area of Jack Creek will be injured, harmed, or killed during dewatering activities. Because no more than 8 juvenile steelhead are expected to be present within the 320-linear-foot dewatering reach, NMFS expects not more than two juvenile S-CCC steelhead will be harmed or killed by the project. If more than 8 juvenile steelhead are captured or more than two juvenile steelhead are harmed or killed, then 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 SCCC 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 provide NMFS with plan(s) and report(s) describing how impacts of the incidental take on listed species in the action area will be monitored and documented.

2.9.4 Terms and Conditions

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

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

   a. The County of San Luis Obispo will retain a NMFS approved biologists with expertise in anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. To ensure that all biologists working on the project are qualified to conduct fish collections in a manner which minimizes all potential risks to steelhead, Caltrans and/or the County of San Luis Obispo will submit the resumes of candidate biologists to NMFS (Yvette Redler-Medina at yvette.redler-medina@noaa.gov) for review and approval prior to conducting the work. 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 channel diversions to ensure that any adverse effects to salmonids are minimized. The biologists will be on site during all dewatering events to capture, handle, and safely relocate steelhead. Caltrans or the biologist will notify NMFS biologist Yvette Redler-Medina at yvette.redler-medina@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, Yvette Redler-Medina, by phone (text) immediately at (916) 317-1149 or the NMFS Central Coast Office (Santa Cruz, California) at 831 460-7564. The purpose of the contact is to review the activities resulting in take, 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:

a. 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.

b. Fill material for cofferdams/in-stream diversions 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 31.

c. Any pumps used to divert live stream flow, outside the dewatered work area, 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.

d. Treated wood may not be used in any temporary platforms or scaffolds in the creek 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 31.

e. In areas where concrete is used, a dry work area must be maintained to prevent conveyance of runoff from curing concrete to the surface waters of the adjacent stream until it has fully cured 30 days after it has been poured; otherwise, concrete sealants will be applied and allowed to fully cure before coming into contact with water. Water that inadvertently contacts uncured concrete must not be discharged into surface

waters.

f. Equipment will be fueled and maintained at least 60 feet from the river and away from any storm water or drainage courses and equipment will be checked for leaks prior to in-channel work each day. If leaks occur during work in the channel (top of bank to top of bank), Caltrans or their contractor will contain the spill and remove the affected soils.

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

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

a. 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. The report must be submitted to:

NMFS Central Coast Branch Chief
USGS Pacific Coast & Marine Science Center
2885 Mission Street
Santa Cruz, California, 95060

The report must contain, at a minimum, the following information:

i. Project Construction and Fish Relocation Report -- The report(s) must include the dates construction began and was completed; a discussion of design compliance including: vegetation installation, and post-construction longitudinal profile and cross sections; 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 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.

iii. Post-Construction Vegetation Monitoring and Reporting -- Caltrans must develop and submit for NMFS' review a plan to assess the success of revegetation of the site. A draft of the revegetation monitoring plan must be submitted to NMFS (address specified in 3a above) for review and approval prior to the beginning of the 2021 in-stream work season (June 15, 2021). 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).

(1) Both the County of San Luis Obispo and Caltrans have programs that support the identification, remediation, and removal of fish passage barriers. NMFS values these efforts and recommends that Caltrans and the County continue to work collaboratively, both together and with NMFS, to remedy fish passage impediments and improve instream access for steelhead.

2.11 Reinitiation of Consultation

This concludes formal consultation for Dover Canyon Road Bridge Replacement Project.

As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS 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 identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion, or (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 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 are Caltrans. Other interested users could include the County of San Luis Obispo. Individual copies of this opinion were provided to Caltrans. The format and naming adheres to conventional standards for style.

3.2 Integrity

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

3.3 Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

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