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

March 17, 2020 **Refer to NMFS No:** WCRO-2019-02689

Randy LaVack
Branch Chief, Senior Environmental Planner
California Department of Transportation, District 5
50 Higuera Street
San Luis Obispo, California 93401-5415

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Soquel Creek Bridge Scour Repair Project (EA: 05-1H480) in the City of Soquel, Santa Cruz County, California

Dear Mr. LaVack:

Thank you for your letter of December 11, 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 Soquel Creek Bridge Scour Repair Project (EA: 05-1H480). This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

The California Department of Transportation (Caltrans[1]) proposes to address localized scour on the western bank of Soquel Creek at the Soquel Creek Bridge (No. 36-0013), on State Route 1 (SR-1) at post mile (PM) 13.31 in Santa Cruz County. The proposed project will remove damaged sack concrete slope protection and install rock slope protection (RSP) along the western bank underneath the bridge. Caltrans expects the project to begin in 2023 and to take approximately 60 working days.

The enclosed biological opinion is based on our review of Caltrans' proposed project and describes NMFS' analysis of potential effects on threatened Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*) and its designated critical habitat, and endangered CCC coho

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

salmon (*O. kisutch*). In the enclosed biological opinion, NMFS concludes the project is not likely to jeopardize the continued existence of these species; nor is it likely to adversely modify critical habitat. However, NMFS anticipates that take of CCC steelhead, and endangered CCC coho salmon may occur. An incidental take statement which applies to this project with non-discretionary terms and conditions is included with the enclosed biological opinion.

NMFS has reviewed the proposed project for potential effects on EFH and determined that the proposed project would adversely affect EFH for Pacific Coast Salmon, which are managed under the Pacific Coast Salmon Fishery Management Plan. While the proposed action contains measures to minimize, mitigate, or otherwise offset the adverse effects to EFH, an additional EFH Conservation Recommendation is included in this opinion. Please be advised that regulations (50 CFR 600.092) to implement the EFH provisions of the MSA require your office to provide a written response to this letter within 30 days of its receipt and prior to the final action. A preliminary response is acceptable if a final response cannot be completed within 30 days. Your final response must include a description of how the EFH Conservation Recommendation will be implemented and any other measures that will be required to avoid, mitigate, or offset adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendation, you must provide an explanation for not implementing this recommendation at least 10 days prior to final approval of the action.

Please contact Elena Meza, North Central Coast Office in Santa Rosa, California at (707) 575-6068, or via email at Elena.Meza@noaa.gov if you have any questions concerning this section 7 and EFH consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Paul Andreano, Caltrans District 5, San Luis Obispo (paul.andreano@dot.ca.gov)
Copy to ARN File # 151422WCR2019SR00202

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response, and Fish and Wildlife Coordination Act Recommendations

Soquel Creek Bridge Scour Repair Project (EA: 05-1H480)
NMFS Consultation Number: WCRO-2019-02689
Action Agency: California Department of Transportation

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?
Central California Coast Steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	No
Central California Coast Coho Salmon (*O. kisutch*)	Endangered	Yes	No	n/a	n/a

Table 2. Essential Fish Habitat and NMFS' Determinations:

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: March 17, 2020

Table of Contents

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 also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

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

1.2 Consultation History

On September 27, 2019, NMFS received an initiation package from California Department of Transportation (Caltrans) requesting formal consultation for a proposed action that is likely to adversely affect Central California Coast (CCC) steelhead and its designated critical habitat, CCC coho salmon (which does not have critical habitat at this location), and Essential Fish Habitat (EFH) for Pacific salmon.

The NMFS Santa Rosa office provided a letter of insufficiency on October 2, 2019, along with a request for additional information. Caltrans replied on October 27, 2019, and provided a biological assessment (BA) addendum containing additional information regarding: (1) project description; (2) effects descriptions and determinations; and (3) additional avoidance and minimization measures for steelhead and coho.

Due to workload issues, the NMFS Santa Rosa office requested that the NMFS Arcata office conduct the consultation on November 15, 2019. The Arcata office accepted the assignment on November 18, 2019.

After review of the October 27, 2019 draft BA and addendum, the NMFS Arcata office requested additional information on November 21, 2019. The new information request included: (1) methods proposed to rebuild the stream channel; (2) an updated description of the action area to include downstream turbidity; (3) expansion of the EFH discussion to include riparian

function; (4) additional information about fish relocation techniques; (5) information on any California Department of Fish and Wildlife (CDFW) mitigation requirements for take of CCC coho (also a state-listed species); and (6) inclusion of all project description information and minimization measures in a single BA rather than providing the original insufficient BA and multiple addenda.

Caltrans provided an updated BA on December 3, 2019 along with a comment letter provided by CDFW. However, the new BA still required an updated description of the action area, and a description of the channel rebuild. NMFS provided these comments on December 3, 2019, and informed Caltrans they could request initiation of consultation without the channel rebuild information, yet they would need to provide it before consultation could be completed.

NMFS staff called CDFW staff to coordinate and gather additional technical information about the site, including habitat and fish use of the action area, and to get their opinion on the channel rebuild. At that time, NMFS and CDFW staff agreed to request that our hydraulics engineers provide their opinions about the channel re-build.

NMFS reviewed the project package submitted on December 11, 2019 and determined that sufficient information had been provided to initiate consultation. NMFS conveyed this consultation initiation date to Caltrans via email on December 11, 2019.

On December 12, 2019, NMFS requested specific hydraulics information to help our hydraulics engineer evaluate RSP placement and methods to rebuild the channel. Caltrans submitted this information on December 17, 2019.

On January 13, 2019, NMFS requested an approximation of the total length of stream that will be dewatered to include additional space for excavation buffers and diversion materials. Caltrans provided this estimate later that same day, and the information was included in the proposed action.

On February 6, 2020, NMFS provided recommended methods to rebuild the channel, and Caltrans responded on February 7, 2020 accepting the recommendations. These recommendation were incorporated into the description of the proposed action.

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). Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910).

Caltrans proposes to repair and extend stabilization measures at the western abutment and concrete columns of the Soquel Creek Bridge on Highway 1 in Santa Cruz County, California. The action will remove damaged sack concrete below arches and columns #3 and #4 and replace it with a 5.5-foot thick layer of 1-ton (32-inch diameter) rock slope protection (RSP) spanning the western bank of the creek under the bridge.

Access and staging will require removal of up to 2,376 square feet of riparian vegetation, which consists mainly of exotic plants and exotic acacia trees. These disturbed areas will be replanted with native vegetation upon project completion.

The RSP layer would extend from 28 feet upstream of Column #4 (to provide erosion protection at the culvert discharge outlet from Wharf Road), to the downstream edge of Column #1. The RSP layer would measure approximately 128 feet long by 5.5 feet deep by 48 feet wide (toward the stream) with a volume of approximately 1,977 cubic yards. It would include a flat, benched section along the top of the bank with the balance placed on a 1.5:1 slope (maximum). Based on preliminary design, approximately 25% (495 cubic yards) of the RSP will be placed below the Ordinary High Water Mark (OHWM) and the remaining 75% (1,482 cubic yards) will be placed on the bank and bench above the OHWM. To avoid changing the cross sectional area of the channel, the RSP at the toe of the slope would be buried below grade.

To allow placement of RSP below channel grade, the contractor will excavate approximately 140 linear feet of streambed to approximately its full width of 22 feet. The contractor will rebuild the streambed using a mix of course and fine material comparable to the mix of the downstream riffle crest, which will include approximately 70% gravel and/or cobble and about 30% fines. The 30% fines will fill voids and minimize subsurface flow at depths. The material placed in the channel will be done in engineered lifts and compacted in approximately six-inch lifts. Gravel and cobbles may be derived from native material excavated from the streambed and/or imported washed rock. The fines will be derived from the excavated native material. When construction is complete, the construction site will be re-watered slowly to prevent loss of surface flow, and to prevent a sudden increase in stream turbidity.

To facilitate stream excavation and RSP placement, the contractor will be required to construct a "clear water" stream diversion around the full length of excavation, which includes additional length to accommodate diversion structures and a buffer to accommodate slumping of the excavation. Caltrans estimates that up to approximately 240 feet of stream will be impacted by the diversion. The diversion structures will likely consist of a culvert pipe between cofferdams, which will allow for gravity flow and downstream fish passage. Other methods, such as pumping or a lined open trench could also be considered, as needed. The contractor will be required to provide a stream diversion and dewatering plan for NMFS' review before construction.

The contractor will also be required to relocate any fish in the affected reach before construction begins. Caltrans provided basic fish relocation take minimization measures in their BA; however, Caltrans also committed to providing a full fish relocation plan to NMFS for review prior to starting of work.

In addition to the above-described take avoidance and minimization measures, Caltrans proposes to implement the following standardized Best Management Practices, which are described in detail in Caltrans' Construction Site BMP Manual (Caltrans 2017). Each code corresponds to the section of the manual that contains the detailed description and diagrams. However, some of the listed BMPs may not be necessary depending on conditions encountered at the time of construction.

- SS-1 Scheduling
- SS-2 Preservation of Existing Vegetation
- SS-3 Hydraulic Mulch
- SS-6 Straw Mulch
- SS-7 Geotextiles, Plastic Covers, Erosion Control Blankets/Mats
- SS-9 Earth Dikes/Drainage Swales & Lined Ditches
- SS-10 Outlet Protection/Velocity Dissipation Devises
- SS-11 Slope Drains
- SS-12 Streambank Stabilization
- SC-3 Sediment
- SC-4 Check Dam
- SC-5 Fiber Rolls
- SC-6 Gravel Bag Berm
- SC-7 Street Sweeping and Vacuuming
- SC-8 Sandbag Barrier
- SC-9 Straw Bale Barrier
- SC-10 Storm Drain Inlet Protection
- WE-1 Wind Erosion Control
- NS-1 Water Conservation Practices
- NS-6 Illicit Connection/Illegal Discharge Detection and Reporting
- NS-8 Vehicle and Equipment Cleaning
- NS-9 Vehicle and Equipment Fueling
- NS-1O Vehicle and Equipment Maintenance
- WM-1 Material Delivery and Storage
- WM-2 Material Usage
- WM-3 Stockpile Management
- WM-4 Spill Prevention and Control
- WM-5 Soil Waste Management
- WM-6 Hazardous Waste Management
- WM-9 Sanitary/Septic Waste Management
- WM-10 Liquid Waste Management
- TC-l Stabilized Construction Entrance/Exit

Caltrans considered whether or not the proposed action would facilitate any future activities that may affect listed salmonids or their habitats, and determined that it would not. While the project may extend the life of the bridge, it will not create any conditions that would change the type or frequency of the bridge's use.

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.

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

The biological opinion analyses the effects of the federal action on the following Federally-listed species (Distinct Population Segment (DPS) or Evolutionary Significant Unit (ESU) and designated critical habitat:

Central California Coast (CCC) steelhead DPS (*O. mykiss*)
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005);

Central California Coast (CCC) Coho salmon ESU (*O. kisutch*)
Endangered (70 FR 37160, June 28, 2005).

The CCC steelhead DPS includes steelhead in coastal California streams from the Russian River to Aptos Creek, and the drainages of Suisun, San Pablo, and San Francisco bays (71 FR 5248). The CCC coho salmon ESU includes coho from Punta Gorda in northern California south to, and including, Aptos Creek in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system (61 FR 56138).

The action area is within designated critical habitat for CCC steelhead (steelhead). CCC steelhead critical habitat is designated from the Russian River to the San Lorenzo River to a lateral extent of ordinary high water (OHW) in freshwater stream reaches, and to extreme high water in estuarine areas.

CCC coho salmon critical habitat is designated to include all river reaches accessible[2] to listed coho salmon from Punta Gorda in northern California south to the San Lorenzo River in central

[2] Accessible reaches are those within the historical range of the ESU that can still be occupied by any life stage of coho salmon. Inaccessible reaches are those above longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years) and specific dams within the historical range of the ESU identified in 64 FR 24049.

California; therefore, CCC coho critical habitat is NOT designated in Soquel Creek.

2.2.1.1 General Life History of Listed Species

CCC Steelhead

Steelhead are the anadromous form of *O. mykiss*, which spawn in freshwater and migrate 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 generally 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 ecotype expressed in the 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 sedimentation and suitable flow velocities. Females lay eggs in 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 usually select spawning sites in pool-riffle transition areas of streams with gravel cobble substrates between 0.6 to 10.2 centimeters (cm) in diameter and flow velocities between 40-91 cm per second (Smith 1973; Bjornn and Reiser 1991). Eggs incubate in redds for approximately 25 to 35 days depending on water temperature (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 only 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. Stream temperatures influence the rate of smoltification, with warmer temperatures leading to more rapid transition. Downstream migration of smolts typically occurs from April to June when temperature and stream flows increase. Preferred temperature for smoltification and outmigration is 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 such as Soquel Creek with a seasonal freshwater lagoon, winter storms or artificial breeching 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).

CCC Coho Salmon

The life history of coho salmon in California has been well documented (Shapovalov and Taft 1954; Hassler 1987; Weitkamp et al. 1995). In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple three year life cycle. Adult salmon typically begin the immigration from the ocean to their natal streams after heavy late-fall or winter rains breach the sand bars at the mouths of coastal streams (Sandercock 1991). Coho salmon are typically associated with small to moderately-sized coastal streams characterized by heavily forested watersheds; perennially-flowing reaches of cool, high quality water; dense riparian canopy; deep pools with abundant overhead cover; instream cover consisting of large, stable woody debris and undercut banks; and gravel or cobble substrates (Sandercock 1991). Immigration continues into March, generally peaking in December and

January, with spawning occurring shortly after arrival at the spawning ground (Shapovalov and Taft 1954).

When in freshwater, optimal habitats for successful coho include adequate quantities of: (1) deep complex pools formed by large woody debris; (2) adequate quantities of water; (3) cool water temperatures (when maximum weekly average water temperatures exceed 18°C coho salmon are absent from otherwise suitable rearing habitat [Welsh et al. 2001]; temperatures between 12-14° C are preferred; and the upper lethal limit is between 25-26°C.); (4) unimpeded passage to spawning grounds (adults) and back to the ocean (smolts); (5) adequate quantities of clean spawning gravel; and (6) access to floodplains, side channels and low velocity habitat during high flow events. Numerous other requirements exist (i.e., adequate quantities of food, dissolved oxygen, low turbidity, etc.), but in many respects these other needs are generally met when the six freshwater habitat requirements listed above are at a properly functioning condition.

The eggs generally hatch after four to eight weeks, depending on water temperature. Survival and development rates depend, in part, on fine sediment levels within the redd. Under optimum conditions, mortality during this period can be as low as 10 percent; under adverse conditions of high scouring flows or heavy siltation, mortality may be close to 100 percent (Baker and Reynolds 1986). McMahon (1983) found that egg and fry survival drops sharply when fines make up 15 percent or more of the substrate. The newly-hatched fry remain in the redd from two to seven weeks before emerging from the gravel (Shapovalov and Taft 1954). Upon emergence, fry seek out shallow water, usually along stream margins. As they grow, juvenile coho salmon often occupy habitat at the heads of pools, which generally provide an optimum mix of high food availability and good cover with low swimming cost (Nielsen 1992). In the spring, as yearlings, juvenile coho salmon undergo a physiological process, or smoltification, which prepares them for living in the marine environment. Emigration timing is correlated with precipitation events and peak upwelling currents along the coast. Entry into the ocean at this time facilitates more growth and, therefore, greater marine survival (Holtby et al. 1990).

2.2.2 Status of Listed Species

NMFS assesses four population viability[3] parameters to discern the status of the listed ESUs and DPSs and to assess each species 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 data to evaluate these population viability parameters quantitatively, NMFS has used existing information to determine the general condition of the populations in the CCC steelhead DPS and the CCC coho salmon ESU, and factors responsible for the current status of these listed species.

The population viability parameters are used as surrogates for numbers, reproduction, and distribution, as defined in the regulatory definition of jeopardy (50 CFR 402.20). For example, abundance, population growth rate, and distribution are surrogates for numbers, reproduction, and distribution, respectively. The fourth parameter, diversity, is related to all three regulatory

[3] 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).

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.

2.2.2.1 Status of CCC Steelhead

Historically, approximately 70 populations of steelhead existed in the CCC steelhead DPS (Spence et al. 2008; Spence et al. 2012). Approximately 37 of these populations were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts (Bjorkstedt et al. 2005). The remaining populations were dependent upon immigration from nearby CCC steelhead DPS populations to ensure their viability (McElhaney et al. 2000; Bjorkstedt et al. 2005).

Abundance data for CCC steelhead are limited, however, existing information indicates population abundances have been substantially reduced from historical levels. In the mid-1960's, a total of 94,000 adult steelhead were estimated to spawn in CCC steelhead rivers, including 50,000 fish in the Russian River, the largest population in the DPS (Busby et al. 1996). Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with recent estimates for several streams (Lagunitas, Waddell, Scott, San Vicente, Pudding, and Caspar creeks) at individual run sizes of 500 fish or less (62 FR 43937). Some loss of genetic diversity has been documented and attributed to previous among-basin transfers of stock and local hatchery production in interior populations in the Russian River (Bjorkstedt et al. 2005). In San Francisco Bay streams, reduced population sizes and habitat fragmentation has likely also led to loss of genetic diversity in these populations. For more detailed information on trends in CCC steelhead abundance, see: Busby et al. 1996; Good et al. 2005; Spence et al. 2008; Williams et al. 2011; and Williams et al. 2016.

CCC steelhead have experienced serious declines in abundance and long-term population trends suggest a negative growth rate, indicating the DPS may not be viable in the long-term. DPS populations that historically provided enough steelhead immigrants to support dependent populations may no longer be able to do so, thereby putting dependent populations at increased risk of extirpation. Recent status reviews and return data indicate an ongoing potential for the DPS to become endangered in the future (Good et al. 2005). In 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834). A CCC steelhead viability assessment completed in 2008 concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable, and that the limited information available did not indicate that any other CCC steelhead populations could be demonstrated to be viable (Spence et al. 2008).

In the Santa Cruz Mountains, the California Coastal Monitoring Program (CMP) has been initiated for CCC steelhead.[4] New information from three years of the CMP indicates that population sizes there are perhaps higher than previously thought. However, the long-term downward trend in the Scott Creek population, which has the most robust estimates of abundance, is a source of concern. Although steelhead occur in the Russian River, the ratio of hatchery fish to natural origin fish remains a concern. The viability of San Francisco Bay watershed populations remains highly uncertain. Population-level estimates of adult abundance

[4] For more information on the California Coastal Monitoring Program, visit: http://www.calfish.org/Home.aspx.

are not available for any of the seven independent populations inhabiting the watersheds of the coastal strata (Novato Creek, Corte Madera Creek, Guadalupe River, Saratoga Creek, Stevens Creek, San Francisquito Creek, and San Mateo Creek). The scarcity of information on CCC steelhead abundance continues to make it difficult to assess whether conditions have changed appreciably in the last ten years (Williams et al. 2011, NMFS 2016b). On May 26, 2016, NMFS chose to maintain the threatened status of the CCC steelhead (81 FR 33468).

2.2.2.2 Status of CCC Coho Salmon

Historically, the CCC coho salmon ESU was composed of approximately 76 coho salmon populations. Most of these were dependent populations that needed immigration from other nearby populations to ensure their long-term survival, as described above. Historically, there were 11 functionally independent populations and one potentially independent population of CCC coho salmon (Spence et al. 2008). Most of the populations in the CCC coho salmon ESU are currently doing poorly. Low abundance is common, and some populations have been extirpated, as described below.

A comprehensive review of estimates of historic abundance, decline, and present abundance of coho salmon in California is provided by Brown et al. (1994). They estimated that annual spawning numbers of coho salmon in California ranged between 200,000 and 500,000 fish in the 1940's, which declined to about 100,000 fish by the 1960's, followed by a further decline to about 31,000 fish by 1991. Brown et al. (1994) concluded that the abundance of California coho salmon had declined more than 94 percent since the 1940's, with the greatest decline occurring since the 1960's. More recent abundance estimates vary from approximately 600 to 5,500 adults (Good et al. 2005). Recent NMFS status reviews (NMFS 2001; NMFS 2003; Good et al. 2005; Spence et al. 2008) indicate that the CCC coho salmon are likely continuing to decline in number. Recent status reviews for CCC coho salmon conclude that this ESU is presently in danger of extinction (NMFS 2001, NMFS 2003, Good et al. 2005, and Williams et al. 2011, NMFS 2016b).

Available information suggests that CCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative). CCC coho salmon have experienced acute range restriction and fragmentation (Brown et al. 1994). Many dependent populations that supported the species' overall numbers and geographic distributions have been extirpated. This suggests that populations that historically provided support to dependent populations via immigration have not been able to provide enough immigrants for many dependent populations for several decades. Adams et al. (1999) found that in the mid 1990's coho salmon were present in 51 percent (98 of 191) of the streams where they were historically present, and documented an additional 23 streams within the CCC coho salmon ESU in which coho salmon were found for which there were no historical records.

Recent genetic research in progress by both the NMFS Southwest Fisheries Science Center and the Bodega Marine Laboratory has documented a reduction in genetic diversity within subpopulations of the CCC coho salmon ESU (Bjorkstedt et al. 2005). The influence of hatchery fish on wild stocks has also contributed to the lack of diversity through outbreeding depression and disease. The near-term (10-20 years) viability of many of the extant independent CCC coho salmon populations (Garcia River, Gualala River, Russian River, and San Lorenzo River) is of serious concern.

On June 28, 2005, NMFS issued a final listing determination for CCC coho salmon, changing their status from threatened to endangered (70 FR 37160). The most recent status review (Williams et al. 2016 [81 FR 33468]) documents that conditions for CCC coho salmon have not improved since the last status review in 2011 (Williams et al. 2011). Based on this information, NMFS chose to maintain the endangered listing of CCC coho salmon (81 FR 33468). NMFS's recovery plan (NMFS 2012) for the CCC coho salmon ESU identified the major threats to population recovery. These major threats include: roads, water diversions and impoundments, and residential development.

2.2.2.3 Status of CCC Steelhead Critical Habitat

In designating critical habitat, NMFS considers the following requirements of the species: 1) space for individual and population growth and for normal behavior; 2) food, water, air, light, minerals, or other nutritional or physiological requirements; 3) cover or shelter; 4) sites for spawning, reproduction, and rearing offspring; and, generally 5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on Physical or Biological Features (PBF) and/or essential habitat types within the designated area that are essential to the conservation or protection (81 FR 7414). PBFs for CCC steelhead critical habitat and their associated essential features within freshwater include:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development;

2. Freshwater rearing sites with:
    a. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
    b. Water quality and forage supporting juvenile development; and
    c. 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;

3. Freshwater migration corridors free of obstruction and excessive predation 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.

The condition of CCC steelhead critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat[5]: logging, agriculture, mining, urbanization, stream channelization and bank stabilization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Habitat impacts of concern include

[5] Other factors, such as over fishing and artificial propagation have also contributed to the current population status of these species. All these human induced factors have exacerbated the adverse effects of natural environmental variability from such factors as drought and poor ocean productivity.

altered streambank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality/quantity, lost riparian vegetation, and increased sediment delivery into streams from upland erosion (Weitkamp et al. 1995; Busby et al. 1996). Based on NMFS' familiarity with the landscapes in which this critical habitat occurs, these impacts continue to persist today. Widespread diverting of rivers and streams, as well as the pumping of groundwater hydraulically connected to stream flow, has dramatically altered the natural hydrologic cycle in many of the streams within the CCC steelhead DPS, which can delay or preclude migration and dewater aquatic habitat. Overall, the current condition of CCC steelhead critical habitat is degraded, and does not provide the full extent of conservation value necessary for the recovery of the species.

2.2.3 Additional Threats to CCC Steelhead and its Critical Habitat, and CCC Coho Salmon

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

The threat to CCC steelhead and CCC coho salmon from global climate change will increase in the future. Modeling of climate change impacts in California suggests that average summer air temperatures are expected to continue to increase (Lindley et al. 2007; Moser et al. 2012). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe et al. 2004; Moser et al. 2012; Kadir et al. 2013). Total precipitation in California may decline, and critically dry years may increase (Lindley et al. 2007; Schneider 2007; Moser et al. 2012). Wildfires are expected to increase in frequency and magnitude (Westerling et al. 2011, Moser et al. 2012). Many of these changes are likely to further degrade salmonid habitat by, for example, reducing stream flows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to salmonids. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia et al. 2002, Ruggiero et al. 2010). In marine environments, ecosystems and habitats important to juvenile and adult salmonids are likely to experience changes in temperatures, circulation, water chemistry, and food supplies (Brewer and Barry 2008; Feely 2004; Osgood 2008; Turley 2008; Abdul-Aziz et al. 2011; Doney et al. 2012). These projections are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007; Santer et al. 2011).

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the project encompasses the entire construction footprint that would be subject to ground disturbance and vegetation clearing, including the State Route 1 and Porter Street onramp embankments at Post Mile 13.31 in the town of Soquel. The action area also includes the banks and bed of the creek channel for approximately 240 feet below the bridge where dewatering, excavation, and RSP placement will occur, and an additional 300 feet of creek where construction related turbidity is expected to occur. The overall size of the action area is approximately 1.89 acres.

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

Soquel Creek flows into the Pacific Ocean at Monterey Bay and is the second largest watershed located entirely within Santa Cruz County. The watershed is characterized by rapid geologic uplift, deep valleys, and seismic activity in areas with relatively weak rock leading to conditions that result in frequent landslides (Balance Hydrologics, Inc. 2003). The climate is Mediterranean, with over 90 percent of annual precipitation occurring between November and April. Cool, moist coastal fog generally alternates with clear, warm weather during the months of May through September, and significant rainfall during that time is rare. Stream flow in the watershed is highly variable and can quickly alternate between low base flow conditions to high flows that quickly recede. Recorded flows ranged from an estimated 15,000 cubic feet per second (CFS) during the 1955 flood to 0 CFS during drought years at the USGS gage in the town of Soquel approximately 0.7 miles upstream of the action area (gage number 11160000). Water diversions were identified as one of the most significant limiting factors for coho salmon survival and recovery in the watershed (NMFS 2012). These diversions have resulted in decreased baseflows as discussed by Balance Hydrologics, Inc. (2003) who documented, following the decade of the 1950's, annual minimum baseflows decreased significantly. Baseflows in the 1950's ranged between two to four CFS and now minimum summer baseflows range from zero to two CFS at the USGS gage (Balance Hydrologics, Inc. 2003).

The Soquel Creek watershed is located in a rift zone composed of three distinctive geologic blocks separated by the San Andreas and Zayante fault zones (Balance Hydrologics, Inc. 2003). Rapid uplift, weak rock, deeply incised canyons, and seismic activity act together to create an environment where large landslides are prevalent (Balance Hydrologics, Inc. 2003). Landslides are identified as a source of chronic fine and coarse sediment input (Balance Hydrologics, Inc. 2003) and the rate of input is exacerbated by a high road density (many poorly maintained) and

rural residential development (NMFS 2012). These sources of fine sediment are likely the primary cause of poor spawning substrate conditions in the lower watershed, including the action area. A significant proportion of the spawning substrates are covered with fine sediment which is generally unsuitable for spawning.

The lower 7 miles of Soquel Creek has seen extensive development, both urban and agricultural, and the riparian canopy has been greatly diminished along a number of reaches. Additionally, numerous water diversions occur along this reach, which reduce summer flows considerably (NMFS 2012).

2.4.2 Status of CCC steelhead and CCC Coho Salmon in the Action Area

Coho salmon have only been observed in the Soquel Creek watershed twice in recent decades - in 2008 and 2015. Steelhead occur regularly, and 22 years of juvenile density data are available for several reaches of Soquel Creek including one reach that includes the action area. These data are available in reports generated by D.W. Alley & Associates (DWAA) for the County of Santa Cruz. These data are most recently summarized by DWAA (2019) for sampling through 2018, and much of the information below is from this report.

2.4.2.1 CCC Steelhead in the Action Area

NMFS' Coastal Multispecies Recovery Plan (NMFS 2016a) describes the CCC steelhead population of Soquel Creek as having an essential role in the recovery of the DPS. The CCC steelhead population is also described as "independent," meaning that it is able to sustain itself without relying on stray fish from adjacent systems. The Soquel Creek population is part of the Santa Cruz Mountains Diversity Stratum. The overall recovery target for this Diversity Stratum is 12,200 individuals, and Soquel Creek's portion of this target is 1,800.

Soquel Creek was historically one of the most important steelhead spawning and rearing streams in Santa Cruz County (Titus et al. 2010). Based on data collected by CDFW during surveys in 1959 and 1962, the juvenile abundance (approximately 17,500 fish) corresponded to an adult steelhead run of approximately 500-1,000 spawning pairs (Titus et al. 2010). Indices of adult returns to the mainstem, East and West Branches and the lagoon for 1994 and 1997-2005 averaged 523 pairs (annual variability between 356 and 784) (Alley 2006).

DWAA has conducted long term sampling in Soquel Creek during the August through October period. Fish densities at most of their sampling sites appear highly linked to streamflow during the sampling period as well as the overall water year type and periodicity of flows coinciding with adult steelhead migration into the stream. However, the reach that includes the action area had very low density in all years. This is likely due to the poor habitat conditions created by impaired flows, and lack of pools and cover.

Average densities of juvenile steelhead over the 22 years of sampling per site averages 5.4 to 86.2 per 100 feet of stream. The 5.4 per 100 feet figure is from the reach that includes the action area. The highest sampled density in the action area reach was 15 juvenile steelhead per 100 feet in 2007. It appears that density in the action area is less dependent on overall steelhead density in the watershed, and more related to locally poor rearing habitat conditions. However, the overall trend of steelhead density across all sampled sites is negative (DWAA 2019).

Additionally, Caltrans personnel observed several 10 to 16-inch steelhead holding under the bridge on January 30, 2019 (Caltrans 2019). Given the size of these fish, it is not clear that they

were mature adult steelhead, and they may have been fish that had reared in the lagoon without returning to sea; however, this is speculation. It does, however, underscore the fact that all steelhead that migrate into or out of Soquel Creek pass through the action area.

2.4.2.2 CCC Coho Salmon in the Action Area

Soquel Creek lost its native run of coho salmon around 1968, and the population is dependent on returns of adult coho from other watersheds (NMFS 2012). Staff from NOAA Fisheries conducted monitoring of juvenile coho salmon in the Soquel Creek watershed during the summers of 2006, 2007, and 2008 (Spence et al. 2011). Of the three survey years, coho salmon were detected in Soquel Creek only during 2008; the first documented occurrence of successful reproduction by coho salmon in Soquel Creek in more than a decade (Spence et al. 2011). Genetic analysis indicated that the juvenile coho surveyed in 2008 were likely the offspring of just one or two adult spawning pairs (Spence et al. 2011).

During their 22 years of sampling, DWAA has not found coho salmon in the action area. However, DWAA (2016) reports capturing and releasing a total of 11 juvenile coho at two sites higher in the watershed during sampling in 2015, which represents the only other known occurrence since 2008.

However, due to the location of the action area at the bottom of the watershed with no known spawning habitat downstream, all coho salmon that migrate into and out of Soquel Creek must pass through the action area. And given the poor quality of rearing and adult holding habitat in the action area, its primary function is likely that of a migratory corridor for both adult and juvenile coho salmon.

The top ecological threats to CCC coho salmon in Soquel Creek listed in the CCC Coho Salmon ESU Recovery Plan (NMFS 2012) includes reduced density, abundance and diversity of individuals; reduced instream habitat complexity, including lack of large wood and shelter; and impaired water flow. Reduced diversity and abundance is a very high threat to all life stages and the CCC coho population as a whole. Reduced instream complexity is a very high threat to summer rearing juveniles and smolts, and a high threat to adults and winter rearing juveniles. Impaired water flow is a very high threat to summer rearing juveniles, and a high threat to smolts. The primary causes of these threats are residential and commercial development, water diversion and impoundments, severe weather patterns, and roads (NMFS 2012).

2.4.3 Status of CCC Steelhead Critical Habitat in the Action Area

The action area is located approximately one mile upstream of Soquel Creek's confluence with Monterey Bay. The lower 0.6 mile of the creek is influenced by the Soquel Creek Lagoon. The lagoon is managed for recreational and wildlife values, including provision of suitable rearing habitat for CCC steelhead. The action area itself is not believed to be presently influenced by fluctuations in lagoon level or tidewater. However, a review of historical photographs indicates the Soquel lagoon was much larger and habitat conditions were more diverse than occurs currently (Alley et al. 2004), so the action area may have historically been influenced by lagoon levels. Additionally, sea level rise is likely to extend the lagoon's influence into the action area at some future time.

The Coastal Multispecies Recovery Plan (NMFS 2016a) rates the following habitat indicators for CCC steelhead in Soquel Creek as "Poor": habitat complexity, sediment transport, hydrology,

and water quality. Recovery strategies will focus on improving these poor conditions as well as those needed to ensure population viability and functioning watershed processes. Recovery strategies will focus on: reducing sediment inputs; improving habitat complexity with large wood and other shelter elements; hydrology improvements including increasing summer base flows via regulation of water use, and decreasing peak flows caused by development and associated impervious surfaces; and floodplain connectivity.

Due to the low gradient of the stream, upstream sediment sources, and potential influence by the lagoon, the streambed in the action area is dominated by fine sediment mixed with small gravel. Therefore, there is no spawning habitat in the action area. The creek is also shallow and wide with little instream or overhanging cover, so rearing habitat is of poor quality. Holding habitat for upstream migrating adult salmonids is also appears to be of poor quality (shallow with little cover); however, Caltrans personnel observed several 10 to 16-inch steelhead holding under the bridge on January 30, 2019 (with eight people fishing for them) (Caltrans 2019), so there could be some potential holding habitat available in the action area. However, the primary function of the action area is likely as a migration corridor for adult and juvenile steelhead.

The creek is moderately incised into the surrounding floodplain, with a steep bank on one or both sides throughout most of the watershed. Including both sides in the action area. A 90-degree bend in the creek at the upstream end of the action area appears to be the result of artificial manipulation of the stream channel (Caltrans 2019). The bend directs flow directly onto the bridge abutment where the scour is occurring. This artificially constructed channel and stabilized banks are likely preventing any natural habitat forming processes. Given the urbanized nature of the surrounding land, any chance of significant restoration of naturally functioning habitat in the action area is unlikely.

The riparian zone in the action area is dominated by exotic and weedy species such as acacia (*Acacia* spp.), cape ivy (*Delairea odorata*) and English ivy (*Hedera helix*). Few native trees remain in the riparian corridor due to the aggressive crowding from the invasive species. Most native trees observed in the action area were planted within the Caltrans right of way, or as landscaping on adjacent properties. Caltrans (2019) identified two coast redwoods (*Sequoia sempervirens*) and two coast live oaks (*Quercus agrifolia*) within the action area.

There are no known section 7 consultations that have previously analyzed adverse impacts to CCC steelhead critical habitat in the action area.

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).

2.5.1 Fish Collection, Relocation and Dewatering

To facilitate completion of the project, the contractor will need to dewater the stream within the

action area. As discussed above in Section 1.3.1, 140 linear feet of the creek will be excavated. Therefore, dewatering will extend above and below this reach to include cofferdams and a buffer area required for slope stability during excavation. Therefore, up to approximately 240 feet may be dewatered.

Caltrans proposes to collect and relocate fish in the work area prior to and during dewatering to avoid fish stranding and exposure to construction. Before and during dewatering of the construction site, all juvenile steelhead and coho salmon that may be in the area to be dewatered will be captured by a qualified biologist using one or more of the following methods: block net, dip net, seine, and/or electrofishing. Collected fish will be immediately released upstream of the action area if possible, or far enough downstream to avoid any downstream impacts of the project such as turbidity. Depending on the number of fish captured, fish may be released at multiple sites to minimize overcrowding of available habitat. Since construction is scheduled to occur between June 15 and October 15, relocation activities will occur during the summer low-flow period after the majority of emigrating smolts have left and before adults have immigrated for spawning.

Fish collection and 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. Since fish relocation activities will be conducted by qualified fisheries biologists following NMFS electrofishing guidelines (NMFS 2000), injury and mortality of juvenile salmonids during capture and relocation will be minimized. Based on prior experience with current relocation techniques and protocols likely to be used to conduct the fish relocation, unintentional mortality of listed juvenile steelhead and salmon expected from capture and handling procedures is not likely to exceed three percent.

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

Sites selected for relocating fish will have similar water temperatures as the capture sites, and have adequate habitat to allow for survival of transported fish and fish already present, in some instances fish may endure short-term stress from crowding at the relocation sites. NMFS cannot accurately estimate the number of fish likely to be affected by competition, but does not expect this short-term stress to reduce the individual performance of steelhead or coho salmon, or cascade through watershed population of these species based on the area that will likely be affected and the relatively small number of salmonids likely to be relocated.

Given the lack of cover, small substrate, and shallow water in the area to be dewatered, we expect all fish to be captured during the relocation effort; therefore, we do not expect additional fish to be exposed to the stressors of dewatering during or after the dewatering process.

To estimate the number of juvenile steelhead and coho salmon that may be present in the action area, NMFS used the data from surveys performed for the County of Santa Cruz within the Soquel Creek watershed (DWAA 2019). Using the high end of the density data provided above in Section 2.4.2, NMFS expects that the maximum density of CCC steelhead would be 15 per 100 feet of stream. Given a diversion length of approximately 240 feet, NMFS estimates that no more than 40 juvenile steelhead will be captured and relocated. As described in Section 2.4.2.2, coho salmon presence in Soquel Creek is sporadic and numbers of individuals is very low. In reality, the chances of encountering juvenile coho salmon in the action area is very low. However, given that a total of 11 juvenile coho salmon were captured in 2015 (though at other locations with better rearing habitat) (DWAA 2016), NMFS believes that juvenile coho may be holding or transiting through the action area during the stream diversion. However, we expect no more than two juvenile coho to be captured and relocated. The expectation of three percent mortality during fish relocation efforts leads to an estimate of two juvenile steelhead mortalities and no juvenile coho mortalities.

2.5.2 Turbidity and Contaminants

Brief periods of turbidity extending as far as 300-feet downstream of the bridge crossing location are expected during the installation and removal of the stream diversion structures. Additionally, turbidity might be expected when winter rains and stream flows return during the first season after construction. The minimization measures are expected to ensure both erosion and turbidity has been minimized and remain insignificant. Contaminants from heavy equipment will be managed in accordance with the proposed minimization measures and discharges are not expected and are therefore are discountable.

2.5.3 Effects to CCC Steelhead Critical Habitat

Streambank stabilization arrests a stream's ability to migrate laterally and create/maintain aquatic habitat, and can result in channel incision and other unfavorable morphological responses (Hall et al. 2007). Additionally, RSP bank stabilization degrades the local habitat by interfering with benthic food production; interferes with establishment of overhanging riparian vegetation and associated cover and food production; and provides poor quality cover for rearing salmonids. Because the action prevents formation of habitat by arresting normal channel function in the action area, it may adversely impact all PBFs of critical habitat, with the exception of spawning areas.

As described in the Section 2.4 above, the action area lies within a highly impacted and simplified reach of the lower mainstem of Soquel Creek that includes extensive bank stabilization. NMFS' Multispecies Recovery Plan (2016a) lists "channel modification" as a "high threat" to rearing juvenile steelhead. In order for natural riverine processes to be meaningfully restored and lead to improved floodplain and channel structure, a significant reworking of infrastructure in the lower watershed would be necessary. The proposed action makes this restoration possibility slightly less likely. Additionally, the change in channel geometry due to the proposed action could result in altered erosion potential of adjacent streambanks. However,

given the poor habitat quality in the action area and existing bank stabilization in and adjacent the action area, NMFS does not expect these potential effects to result in a reduction in the quality or quantity of critical habitat.

Riparian vegetation that will be removed by the proposed action consists mostly of exotic species that exist in a relatively narrow strip along the highway. NMFS does not expect any measurable reductions in quality of critical habitat due to this temporary loss of riparian cover, and replanting with native species is likely to improve riparian function in the action area.

As described in Section 2.5.2, suspended sediment is likely to be produced during installation and removal of the stream diversion, and during the first rains and elevated stream flows after project completion. However, NMFS believes that Caltrans' proposed minimization measures will limit sediment deposition into critical habitat to insignificant levels.

In addition to potentially creating suspended sediment upon return of elevated stream flows, the rebuilt streambed would perpetuate the existing degraded condition of habitat in the action area. The rebuild plan may actually slightly improve habitat conditions, at least initially, with the addition of courser gravel material to the streambed. Therefore, NMFS believes that rebuilding the streambed will not reduce the quality or quantity of critical habitat in the action area.

2.5.4 Combined Effects

The potential exists for simultaneous construction-related impacts to have a synergistic effect that is greater or different than each stressor acting alone. Simultaneous project impacts may include visual impacts from workers and equipment working near or over the watercourses at the same time when fish may be exposed to noise and vibration from construction equipment. Fish may also be exposed to noise and/or visual disturbances during minor increases in turbidity. Most potential project impacts would not occur simultaneously due to logistics of construction that require one phase of the project to be completed prior to starting another. Additionally, the stream diversion will reduce or eliminate exposure to fish by visual and noise disturbances. Because combined effects are either unlikely or of very low intensity, NMFS does not expect any additional reductions in listed salmonid fitness or function of critical habitat due to any combined effects of individual construction elements.

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.

The action area lies within a highly disturbed channel with extensive bank stabilization both upstream and downstream of the action area. This disturbed condition is likely to persist into the future, and bank stabilization structures will likely be repaired as necessary. The proposed action will repair a failing stabilization project, which will perpetuate the current degraded condition of the action area. Additionally, bank stabilization projects that alter streamflow location and direction have the potential to affect upstream and downstream banks. However, with the

information available, we are unable to predict how the proposed action and adjacent stabilization projects would act cumulatively to degrade stream conditions and habitat further.

According to the Coastal Multispecies Recovery Plan (NMFS 2016a), "Streamflow in Soquel Creek is reduced by water diversions and groundwater pumping adjacent to the channel. The relationship between water use and streamflow is complicated by the number of water users, types of diversions (direct and streamside wells), and the lack of coordination between users." These withdrawals often result in dry stream reaches where high quality rearing habitat would be available under unimpaired flows. The action area contains poor quality rearing habitat, which is likely exacerbated by water withdrawals. However, the proposed action is unlikely to change this condition such that it would act cumulatively with continuing water withdrawals to further degrade habitat.

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).

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.

As described in the CCC Coho Recovery Plan (NMFS 2012) and the Coastal Multi-Species Recovery Plan (NMFS 2016a), and discussed in Section 2.2 above, CCC steelhead and CCC coho salmon have declined to a large degree from historic numbers. CCC coho are depressed to the point that their population is highly fragmented. Soquel Creek lost its native run of coho salmon around 1968, and the population is dependent on returns of adult coho from other watersheds (NMFS 2012). Steelhead populations in the CCC steelhead DPS are the most poorly monitored salmonid populations in the North-Central California Coast Recovery Domain (NMFS 2016a). Sub-populations within the CCC steelhead DPS, including Soquel Creek, are generally healthier than CCC coho in the same watersheds; however, population trends for both species are declining. Therefore, survival and full recovery of both populations will be unlikely unless habitat conditions are widely improved.

As discussed in Section 2.4, critical habitat for CCC steelhead is degraded throughout much of their range. Critical habitat for CCC steelhead in the action area is highly degraded by extensive modifications to the stream channel, and is degraded throughout much of the watershed by overconsumption of stream water. Significant improvements to CCC steelhead critical habitat in

the action area is unlikely due to the highly urbanized surrounding land; however, improvements to instream flows could greatly improve critical habitat conditions for CCC steelhead (as well as habitat conditions for CCC coho, which do not have designated critical habitat in Soquel Creek).

The overall effect to CCC steelhead critical habitat in the action area by the proposed action will be to perpetuate poor habitat conditions by maintaining the artificially stabilized streambank. Additionally, short-term impacts would include minor entrainment of suspended sediment and loss of riparian vegetation; however, we consider these impacts to be insignificant in terms of impacts to critical habitat in the action area. Therefore, overall impacts to critical habitat at the scale of the CCC steelhead DPS and North-Central California Coast Recovery Domain are also insignificant.

As described in Section 2.5.1, a small number of juvenile steelhead (approximately two) may be killed during fish relocation efforts, and we do not expect any mortalities of CCC coho juveniles. Due to the relatively large number of juveniles produced by each spawning pair, spawning by CCC steelhead in the Soquel Creek watershed and the broader population areas in future years would be expected to produce enough juveniles to replace any that are lost at the project site. NMFS does not expect that the potential small loss of juveniles caused by this project would impact future adult returns of CCC steelhead to Soquel Creek. Therefore, there would be no impact on future adult returns of CCC steelhead at the scale of the CCC steelhead DPS and North-Central California Coast Recovery Domain.

The action area could be subject to higher average summer air temperatures and lower total precipitation levels due to climate change. Higher air temperatures would likely warm stream temperatures. Reductions in the amount of precipitation would reduce stream flow levels and estuaries may also experience changes in productivity due to changes in freshwater flows, nutrient cycling, and sediment amounts. For this project, all construction activities would be completed before the above effects of climate change are likely to be detected. The short-term effects of project construction would have completely elapsed prior to these climate change effects. Therefore, the project is unlikely to appreciably reduce the likelihood of survival and recovery of CCC coho salmon and CCC steelhead.

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 CCC coho salmon and CCC steelhead, or destroy or adversely modify designated critical habitat for CCC steelhead.

2.9 Incidental Take Statement

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

feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

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

> Take of juvenile coho salmon and steelhead in the form of capture is expected during fish relocation and diversion activities. Up to 2 juvenile coho salmon and 40 juvenile steelhead are expected to be captured and relocated during the Project. Because mortality resulting from relocation activities, including netting and electrofishing, is estimated to be about three percent; zero coho mortalities, and two steelhead mortalities are expected.

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 CCC coho salmon and CCC steelhead:

1. Undertake measures to ensure that harm and mortality to threatened steelhead and endangered coho salmon resulting from fish relocation and dewatering activities are low.
2. Ensure construction methods, minimization measures, and monitoring are properly implemented during construction.
3. Prepare and submit a post-construction report regarding the effects of fish relocation and construction activities.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the 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. Caltrans or their contractor shall submit to NMFS a Construction Site Dewatering

Plan and an Aquatic Species Relocation Plan for review a minimum of 30 days prior to implementing the plans.

b. Qualified biologists with expertise in the areas of anadromous salmonid biology shall conduct fish relocation activities associated with construction. Caltrans will ensure that all biologists working on the project are qualified to conduct fish relocation in a manner which minimizes all potential risks to salmonids.
c. Caltrans or their contractor performing fish relocation shall first use a seine net without a bag to herd fish out of the work site, if practicable, before capturing fish with other nets or using electrofishing techniques. Herding fish out of the work site with a seine will reduce the number of fish exposed to capture and electrofishing activities, and reduce the number of fish subject to risks of mortality. Herding or hazing fish by using an electrofisher shall not be attempted.
d. Salmonids shall be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish must be kept in cool, shaded, and aerated water protected from excessive noise, jostling, or overcrowding. Fish shall not be held in buckets with potential predators. Fish will not be removed from this water except when released. Captured salmonids will be relocated as soon as possible to an instream location in which suitable habitat conditions are present to allow for adequate survival for transported fish and fish already present. Fish will be distributed between multiple pools if biologists judge that overcrowding may occur in a single pool.
e. Caltrans or their contractor shall monitor any screens used to block fish access on a daily basis, or more frequently if necessary, to ensure that no impingement occurs, and to assess whether significant downstream migration is occurring. If downstream migrating fish aggregate at the screen(s), the qualified biologist will relocate these fish to suitable downstream habitat.
f. If any salmonids are found dead or injured, the biologist will contact NMFS biologist Elena Meza by phone immediately at (707) 575-6068. The purpose of the contact is to review the activities resulting in the take and to determine if additional protective measures are required. All salmonid mortalities will be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location, fork length, and be frozen as soon as possible. Frozen samples will be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS Northern California Office in Santa Cruz or Santa Rosa, California without obtaining prior written approval from the appropriate Branch Chief. Any such transfer will be subject to such conditions as NMFS deems appropriate.

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

   a. Caltrans shall 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. Caltrans shall contact NMFS within 24 hours of meeting or exceeding take of listed species prior to project completion. Notify Elena Meza by phone at (707) 575-6068 or email at Elena.Meza@noaa.gov. This contact acts to review the

activities resulting in take and to determine if additional protective measures are required.

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

   Caltrans shall provide a written report to NMFS by January 15 of the year following construction of the project. The report shall be sent to NMFS via email to Elena.Meza@noaa.gov or via mail to Elena Meza at 777 Sonoma Ave. Santa Rosa, CA 95404. The reports shall contain, at a minimum, the following information:

   i. **Construction related activities** -- The report will include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, 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 (by ESU and DPS) killed or injured during Project construction; and photographs taken before, during, and after the activity from photo reference points.
   ii. **Fish Relocation** – The report will include 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; the number of fish relocated by species; the number of fish injured or killed by species and a brief narrative of the circumstances surrounding salmonid 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.

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. NMFS suggests that Caltrans incorporate large woody debris in the form of logs with complex rootwads attached into the RSP. By creating cover and possible scour pools, this measure would help to offset the adverse impacts to designated critical habitat due to the expansion and continuation of the bank stabilization footprint at this location. Properly placed logs could also help Caltrans maintain the stream's thalweg in the desired location. This action would also address one of the high priority recovery actions in the Coastal Multispecies Recovery Plan for CCC steelhead (NMFS 2016a) for Soquel Creek, which is "LWD projects to enhance instream habitat should be implemented." If Caltrans decides to implement this recommendation, NMFS' hydraulic engineers should be consulted on the design. Please contact Elena Meza by phone at (707) 575-6068, or by email at Elena.Meza@noaa.gov to arrange engineering collaboration. Additionally,

Caltrans shall coordinate with NMFS and CDFW to determine whether creating holding habitat for adult steelhead could constitute an "attractive nuisance" at this location due to known fishing pressure.

2. While project activities below OHWM may begin as early as June 15, NMFS recommends beginning stream diversion activities on July 1 or later to further minimize impacts to late-outmigrating smolts.

2.11 Reinitiation of Consultation

This concludes formal consultation for Soquel Creek Bridge Scour Repair Project. As 50 CFR 402.16 states, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the 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. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by Caltrans and descriptions of EFH for Pacific Coast Salmon (Pacific Fishery Management Council (PFMC 2014)), contained in the fishery management plan developed by the PFMC and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The proposed action will adversely affect EFH for Pacific Coast Salmon (PFMC 2014). However, the action area contains no Habitat Areas of Particular Concern (HAPC).

3.2 Adverse Effects on Essential Fish Habitat

The potential adverse effects of the Project on EFH have been described in Section 2.5.3 of the preceding biological opinion. The effects described in this section only pertain to CCC steelhead critical habitat because critical habitat for CCC coho has not been designated in Soquel Creek.

However, the effects to CCC steelhead critical habitat are the same as effects to EFH for coho salmon.

Potential adverse effects to Pacific Coast Salmon EFH include:

1. Temporary disturbances due to excavation of the streambed, and temporary loss of up to 240 feet of streambed to accommodate the stream diversion structures.
2. Short-term turbidity pulses during streambed dewatering and re-watering, and possible sediment entrainment from disturbed ground during the first rains.
3. Minor temporary loss of riparian vegetation.
4. Placement of RSP and expansion of bank stabilization, which will extend the loss of natural fluvial and geomorphic channel dynamics further into the future.

3.3 Essential Fish Habitat Conservation Recommendations

Based on information developed in our effects analysis (see the preceding biological opinion), NMFS has determined that the proposed action would adversely affect EFH for coho salmon within the Pacific Salmon FMP. Pursuant to section 305(b)(4)(a) of the MSA, NMFS offers the following EFH Conservation Recommendation to Caltrans to avoid, minimize, or otherwise offset anticipated adverse effects to EFH.

1. NMFS recommends that logs with rootwads be incorporated into the RSP bank stabilization. Please refer to Conservation Recommendation 1 in Section 2.10 of the biological opinion for details.

Fully implementing this EFH conservation recommendation would protect, by minimizing the adverse effects described in section 3.2 above, approximately 0.032 acres of designated EFH for Pacific Coast salmon.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, Caltrans must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative time frames for the Federal agency response. The response must include a description of measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5 Supplemental Consultation

Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that effects the basis for NMFS' EFH Conservation Recommendations (50 CFR600.920(1)).

4. 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.

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion is Caltrans. Other interested users could include citizens of affected areas, or others interested in the conservation of the endangered and/or threatened species discussed in this opinion. Individual copies of this opinion were provided to Caltrans. A complete record of this consultation is on file at the NMFS North-Central Coast Office in Santa Rosa, California.

4.2 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.

4.3 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 and EFH consultation 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 MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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