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

September 9, 2020 **Refer to NMFS No:** WCRO-2020-01221

James Mazza
Chief, Regulatory Division
San Francisco District, U.S. Army Corps of Engineers
450 Golden Gate Avenue, 4th Floor, Suite 0134
San Francisco, California 94102-3406

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Serra Drive Outfall Repair Project, San Pedro Creek, Pacifica, California (Corps File No. 2020-00114)

Dear Mr. Mazza:

Thank you for your letter dated May 4, 2020, 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 Serra Drive Outfall Repair Project, San Pedro Creek, Pacifica, California. 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 (16 U.S.C. 1855(b)) for this action.

In the enclosed biological opinion, NMFS concludes the proposed action is not likely to jeopardize the continued existence of threatened Central California Coast (CCC) steelhead trout (steelhead), nor likely to result in the destruction or adverse modification of critical habitat for CCC steelhead trout or CCC coho salmon. However, NMFS anticipates take of CCC steelhead will occur as a result of the project activities. An incidental take statement with non-discretionary terms and conditions is included with the enclosed biological opinion.

Regarding EFH, NMFS has reviewed the proposed project for potential effects and determined that the proposed project would adversely affect EFH for species managed under the Pacific Coast Salmon Fishery Management Plan. However, the anticipated effects are minor, temporary, and localized. Therefore, we have no practical EFH Conservation Recommendations to provide and no EFH Conservation Recommendations are included in this document.

Please contact William Stevens, North-Central Coast office in Santa Rosa at (707) 575-6066, or William.Stevens@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Sarah Firestone, Senior Regulatory Project Manager, USACE, San Francisco, sarah.m.firestone@usace.army.mil
Copy to E-File: ARN 151422WCR2020SR00111

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

Serra Drive Outfall Repair Project

NMFS Consultation Number: WCRO-2020-01221
Action Agency: U.S. Army Corps of Engineers

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 trout (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	No
Central California Coast coho salmon (*Oncorhynchus kisutch*)	Endangered	NA	NA	Yes	No

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	No

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: September 9, 2020

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1. INTRODUCTION

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

1.1. Background

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

We 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.

1.2. Consultation History

The City of Pacifica (City) applied for a U.S Army Corps of Engineers (Corps) permit. On May 5, 2020, NMFS received an initiation package from the Corps' San Francisco District requesting formal consultation for a proposed action that is likely to adversely affect Central California Coast (CCC) steelhead trout (steelhead), may affect but not likely to adversely affect its designated critical habitat, designated critical for CCC coho salmon, and have an adverse effect on Essential Fish Habitat (EFH) for species managed under the Pacific Coast Salmon Fishery Management Plan. The Corps determined the proposed action will have no effect on CCC coho salmon. The Corps' initiation package included their May 4, 2020, letter requesting initiation of section 7 consultation and the February 2020 *Section 7 Biological Assessment, Serra Drive Outfall Repair Project, Pacifica, San Mateo County* prepared for the City of Pacifica Public Works Department by WRA, Inc.

On May 6, 2020, NMFS requested additional information via electronic mail. On May 14, 2020, the Corps, through WRA, Inc. provided additional information. On June 3, 2020, the Corps provided NMFS with an updated project description and consultation was initiated.

1.3. Proposed Federal Action

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). Under MSA, 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).

The Corps proposes to issue a permit pursuant to Section 404 of the Clean Water Act of 1972, as amended, 33 U.S.C. § 1344 et seq. to the City to replace an existing, damaged headwall and spillway (outfall) for an 18-inch-diameter reinforced concrete pipe storm drain that discharges into San Pedro Creek, thence to the Pacific Ocean. The proposed project is located in and on the San Pedro Creek bed and bank adjacent to two private residences at 1407 and 1411 Serra Drive. The City maintains the outfall and the streets that will be used for staging areas. The two private landowners have agreed to allow the City to access relevant private property for the project to be implemented.

The storm drain picks up drainage from the surrounding streets and discharges to San Pedro Creek. The existing concrete headwall at the outfall has detached from the pipe due to erosion of the surrounding slope on the creek bank. The City will remove the existing damaged headwall and spillway and construct a new concrete headwall and partially grouted rock rip-rap energy dissipator. The new headwall will be founded on a pier foundation to support the headwall. The energy dissipator will be 7.5 feet wide and located downstream of the concrete headwall. Approximately four feet of rip-rap will be provided on each side of the energy dissipator to provide a transition from the grouted rip-rap to the existing natural slope. The outfall is sized for a 100-year discharge from the pipe, which is 17 cubic feet per second (cfs). At the bottom of the slope, rip-rap will be placed four feet out onto the creek bottom to: (1) provide stability at the toe of the slope; and (2) prevent a scour hole from forming at the end of the partially grouted rock rip-rap energy dissipator at the toe of the creek bank.

Construction within San Pedro Creek limits will be completed using a mini excavator for demolition of the existing spillway and earthwork. Hand tools including rebar cutters, circular saws, etc. will be used for the rest of the demolition and preparatory construction activities. The grading for the headwall will involve approximately 8 cubic yards (cy) of excavation and 14 cy of fill behind the headwall at the top of the bank. Once the area has been graded and prepared, the mini excavator will be removed and a pumper truck will be used to convey concrete to the site. The pumper truck will be parked in the staging area located on the street.

The stream will be diverted using a coffer dam at the upstream end of the temporary work limits. Approximately 10 cy of 15-inch diameter partially grouted rip rap and 15 cy of 15-inch diameter rip-rap will be placed around the new headwall. Exclusion fencing will be placed around the work area adjacent to existing vegetation. Construction will take place over 20 work days between April 1 and October 31, in-channel work occurring between June 15 and October 31.

Earthwork will only occur in-the-dry. To dewater the work area, flow will be collected at the upstream end of the bypass system by constructing a temporary sandbag coffer dam. The coffer dam will have a crest elevation high enough above the channel bottom to provide enough pressure head and freeboard for the bypass pipe inlet, with the bypass pipe set in the channel invert, for gravity flow bypassing the work area where earthwork and hard structure installation will occur.

The flow bypass will only convey baseflows only; any rainfall runoff events that happen during the in-channel work window (June 15 and October 31) will not be controlled by the bypass system. In the unlikely event of storm flows in San Pedro Creek in the summer or early fall, crews will not work in the creek until flows have subsided.

No trees are anticipated to be removed as part of the project, though some willows will be trimmed. Additional vegetation clearing may occur as necessary to facilitate bank stabilization (though removal of vegetation will be restricted to the minimum footprint necessary to complete the work). The City proposes a number of avoidance and minimization measures, including guidelines for: electrofishing, seining, fish relocation, dewatering, erosion control, and general measures (i.e., environmental awareness program, Accidental Spill Prevention and Cleanup Plan, revegetation activities). A detailed description was provided in the biological assessment (WRA, Inc. 2020).

The City's contractor will monitor weather conditions throughout the project. If more than 0.5 inches of rain is forecast within two days, the contractor will cease grading and stabilize the site. The contractor will continue work 24 hours after the end of the precipitation event.

There are no stream gages on San Pedro Creek. However, based on a flow depth of about six inches, summer flows are estimated to be about 3 to 6 cfs or less throughout the summer months. The bypass system may need to safely convey flows as large as 6 cfs, but baseflows may be significantly lower if the preceding winter has had low levels of precipitation.

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

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

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

2.1. Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed

species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion 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 44976), 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'

"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 function of the essential PBFs that help to form that conservation value.

2.2.1 Species Description and Life History

This biological opinion analyzes the effects of the proposed action on the following listed species and their designated critical habitats:

Endangered Central California Coast (CCC) coho salmon ESU (*Oncorhynchus kisutch*)

- Listing determination (70 FR 37160; June 28, 2005)
- Critical habitat designation (64 FR 24049; May 5, 1999);

Threatened Central California Coast (CCC) steelhead trout DPS (*Oncorhynchus mykiss*)

- Listing determination (71 FR 834; January 5, 2006)
- Critical habitat designation (70 FR 52488; September 2, 2005).

2.2.1.1 General Life History of Listed Species

2.2.1.1.1 Coho salmon

Although the Corps has determined the proposed action will have no effect on CCC coho salmon, the following paragraph provides a general summary of coho salmon life history since the effects of the proposed action on CCC coho salmon designated critical habitat will be analyzed in this biological opinion.

The life history of coho salmon in California has been well documented by Shapovalov and Taft (1954) and Hassler (1987). 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 coho salmon typically begin the freshwater migration from the ocean to their natal streams after heavy late fall or winter rains breach the sandbars at the mouths of coastal streams (Sandercock 1991). Delays in river entry of over a month are not unusual (Salo and Bayliff 1958, Eames et al. 1981). Migration continues into March, generally peaking in December and January, with spawning occurring shortly after arrival to the spawning ground (Shapovalov and Taft 1954).

2.2.1.1.2 Steelhead trout

Steelhead are anadromous forms of *O. mykiss*, spending some time in both freshwater and saltwater. Steelhead young usually rear in freshwater for one to three years before migrating to the ocean as smolts, but rearing periods of up to seven years have been reported. Migration to the ocean usually occurs in the spring. Steelhead may remain in the ocean for one to five years (two to three years is most common) before returning to their natal streams to spawn (Busby et al. 1996). The distribution of steelhead in the ocean is not well known. Coded wire tag recoveries

indicate that most steelhead tend to migrate north and south along the continental shelf (Barnhart 1986).

Steelhead can be divided into two reproductive ecotypes, based upon their state of sexual maturity at the time of river entry and the duration of their spawning migration: stream maturing and ocean maturing. Stream maturing steelhead enter fresh water in a sexually immature condition and require several months to mature and spawn, whereas ocean maturing steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. These two reproductive ecotypes are more commonly referred to by their season of freshwater entry (i.e., summer [stream maturing] and winter [ocean maturing] steelhead). The timing of upstream migration of winter steelhead, the ecotype most likely encountered during the proposed action, is typically correlated with higher flow events occurring from late October through May. In central and southern California, significant river outflow is also often required to breach sandbars that block access from the ocean; for this reason, upstream steelhead migration in these areas can be significantly delayed, or precluded entirely during extremely dry periods. Adult summer steelhead migrate upstream from March through September; however, there is no known run of summer steelhead in San Pedro Creek. In contrast to other species of *Oncorhynchus*, steelhead may spawn more than one season before dying (iteroparity); although one-time spawners represent the majority.

Because rearing juvenile steelhead reside in freshwater all year, adequate flow and temperature are important to the population at all times [California Department of Fish and Game (CDFG) 1997]. Outmigration appears to be more closely associated with size than age. In Waddell Creek, Shapovalov and Taft (1954) found steelhead juveniles migrating downstream at all times of the year, with the largest numbers of young-of-year and age 1+ steelhead moving downstream during spring and summer. Smolts can range from 5.5 to 8 inches in length. Steelhead trout outmigration timing is similar to coho salmon (NMFS 2016).

Survival to emergence of steelhead embryos is inversely related to the proportion of fine sediment in the spawning gravels. However, steelhead are slightly more tolerant than other salmonids, with significantly reduced survival when fine materials of less than 0.25 inches in diameter comprise 20 to 25 percent of the substrate. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart 1986).

Upon emerging from the gravel, fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Older fry establish territories which they defend. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Meehan and Bjornn 1991). Steelhead, however, tend to use riffles and other habitats not strongly associated with cover during summer rearing more than other salmonids. Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. In winter, juvenile steelhead become less active and hide in available cover, including gravel or woody debris.

Water temperature can influence the metabolic rate, distribution, abundance, and swimming ability of rearing juvenile steelhead (Barnhart 1986, Bjornn and Reiser 1991, Myrick and Cech 2005). Optimal temperatures for steelhead growth range between 50° and 68° F (Hokanson et al.

1977, Wurtsbaugh and Davis 1977, Myrick and Cech 2005). Variability in the diurnal water temperature range is also important for the survivability and growth of salmonids (Busby et al. 1996).

Suspended sediment concentrations, or turbidity, also can influence the distribution and growth of steelhead (Bell 1973, Sigler et al. 1984, Newcombe and Jensen 1996). Bell (1973) found suspended sediment loads of less than 25 milligrams per liter (mg/L) were typically suitable for rearing juvenile steelhead.

2.2.2 Species Status

2.2.2.1 CCC steelhead trout

Historically, approximately 70 populations of steelhead existed in the CCC steelhead DPS (Spence et al. 2008, Spence et al. 2012). Many of these populations (about 37) 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).

While historical and present data on abundance are limited, CCC steelhead numbers are substantially reduced from historical levels. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this DPS in the mid-1960s, including 50,000 fish in the Russian River -the largest population within the DPS (Busby et al. 1996). Recent estimates for the Russian River are on the order of 4,000 fish (NMFS 1997). 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) of 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 fragmented habitat condition has likely also depressed genetic diversity in these populations.

A recent viability assessment of CCC steelhead 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 were demonstrably viable (Spence et al. 2008). Although there were average returns (based on the last ten years) of adult CCC steelhead during 2007/08, research monitoring data from the 2008/09 and 2009/10 adult CCC steelhead returns show a decline in returning adults across their range compared to the previous ten years. The most recent status update concludes that steelhead in the CCC DPS remain "likely to become endangered in the foreseeable future", as new and additional information does not appear to suggest a change in extinction risk (Howe 2016).

2.2.2.2 CCC coho salmon

Critical habitat is designated for CCC coho salmon in all accessible reaches throughout the ESU, however, CCC coho salmon are not known to inhabit San Pedro Creek. The Corps has

determined the proposed action will have no effect on endangered CCC coho salmon. Therefore, this biological opinion does not include a status of the species section or assesses the effects on endangered CCC coho salmon.

2.2.3 Status of critical habitat

In designating critical habitat, NMFS considers, among other things, 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 breeding, reproduction, or rearing offspring; and, generally; and 5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on Physical or Biological Features (PBF) and/or essential habitat types within the designated area that are essential to the conservation of the species and that may require special management considerations or protection (81 FR 7214).

The designations of critical habitat for the species described above previously used the term primary constituent element or essential features. The new critical habitat regulations (81 FR7414) replace this term with PBFs. The shift in terminology does not change the approach used in conducting a ‘‘destruction or adverse modification’’ analysis, which is the same regardless of whether the original designation identified primary constituent elements, physical or biological features, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

In designating critical habitat, NMFS considers, among other things, 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 breeding, reproduction, or rearing offspring; and, generally; and 5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on PBFs and/or essential habitat types within the designated area that are essential to conserving the species and that may require special management considerations or protection.

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 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; and 3) freshwater rearing sites with: water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

PBFs for CCC coho salmon critical habitat include the following essential habitat types: 1) juvenile summer and winter rearing areas; 2) juvenile migration corridors; 3) areas for growth and development to adulthood; 4) adult migration corridors; and 5) spawning areas. Within these areas, essential features of coho salmon critical habitat include adequate: 1) substrate, 2) water quality, 3) water quantity, 4) water temperature, 5) water velocity, 6) cover/shelter, 7) food, 8) riparian vegetation, 9) space, and 10) safe passage conditions (64 FR 24029).

The condition of CCC coho salmon and CCC steelhead trout 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[1]: logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Impacts of concern include altered stream bank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality, lost riparian vegetation, and increased erosion into streams from upland areas (Weitkamp et al. 1995; Busby et al. 1996; 64 FR 24049; 70 FR 37160; 70 FR 52488). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within this coho salmon ESU and steelhead trout DPS. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand adult and juvenile salmonids in disconnected pools, while unscreened diversions can entrain juvenile salmonids.

2.2.4 Additional Threats to CCC coho salmon, CCC steelhead trout, and their critical habitat

One factor affecting the range-wide status of steelhead, salmon, and their aquatic habitat at large is climate change. Impacts from global climate change are already occurring in California. For example, average annual air temperatures, heat extremes, and sea level have all increased in California over the last century (Kadir et al. 2013). Snowmelt from the Sierra Nevada has declined (Kadir et al. 2013). However, total annual precipitation amounts have shown no discernable change (Kadir et al. 2013). Most ESUs and DPSs may have already experienced some detrimental impacts from climate change. NMFS believes the impacts on listed salmonids to date are likely fairly minor because natural, and local climate factors likely still drive most of the climatic conditions steelhead experience, and many of these factors have much less influence on steelhead abundance and distribution than human disturbance across the landscape. In addition, the coho salmon ESU and steelhead trout DPS considered in this opinion are not dependent on snowmelt driven streams and, thus, not as affected by declining snow packs as, for example, California Central Valley and more northern California species.

The threat to listed salmonids 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

[1] 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 conditions.

more often, and heat wave temperatures are likely to be higher (Hayhoe et al. 2004, Moser et al. 2012, Kadir et al. 2013). Total precipitation in California may decline; critically dry years may increase (Lindley et al. 2007, Schneider 2007, Moser et al. 2012). Wildfires are expected to increase in frequency and magnitude (Westerling et al. 2011, Moser et al. 2012).

Shifting climate patterns across coastal California may impair salmonid population productivity in the future. For example, in the San Francisco Bay region, warm temperatures generally occur in July and August, but as climate change takes hold, the occurrences of these events will likely begin in June and could continue to occur in September (Cayan et al. 2012). Climate simulation models project that the San Francisco region will maintain its Mediterranean climate regime, but will also experience a higher degree of variability of annual precipitation during the next 50 years. The greatest reduction in precipitation is projected to occur in March and April, with the core winter months remaining relatively unchanged (Cayan et al. 2012).

Estuaries may also experience changes detrimental to salmonids. Estuarine productivity is likely to change based on changes in freshwater inflows, nutrient cycling, and sediment amounts (Cayan et al. 2012). 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 et al. 2004, Osgood 2008, Turley 2008, Abdul-Aziz et al. 2011, Doney et al. 2012). The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007, Santer et al. 2011).

2.3. Action Area

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

The action area encompasses the 0.07-acre proposed project footprint which includes an approximately 55 linear-foot section of San Pedro Creek where cofferdams and a diversion structure will be installed and approximately 0.03 acres of bank and bed on the north side of San Pedro Creek where an existing headwall and stormwater outfall will be replaced and adjacent areas where the bank will be stabilized by the placement of rip-rap. Access areas on private property and areas for staging and temporary storage of materials on Serra Drive and/or Solano Drive are part of the action area. The action area also includes San Pedro Creek from the project footprint downstream approximately 100 feet where construction related effects to water quality are expected to occur. The project footprint is located approximately 1.2 miles upstream of the Pacific Ocean.

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).

San Pedro Creek drains a watershed of approximately 8 square miles. There are approximately 4.2 miles of accessible spawning and rearing habitat for steelhead and a small, open estuary that receives perennial flow year round (NMFS 2016).

As of 1968, the local California Department of Fish and Game (CDFG) warden estimated the adult steelhead run at 100 individuals, and Anderson (1974) estimated the run at between 100 and 250 individuals. In 1976, the local CDFG warden estimated 60 adult steelhead had been poached at one road crossing alone, and approximately 40 pairs were observed spawning in the Middle Fork during the winter of 1984-1985 (Titus et al. 2010). In April 2008, at least 16 adults and several smolts were observed in the estuary (NMFS 2016). During the winter of 2011-12, redd surveys were conducted throughout a 1.117 kilometer reach of the Middle Fork San Pedro Creek; no redds or steelhead were observed (Jankovitz 2012). However, during the winter of 2012-13, Jankovitz (2013) observed 12 steelhead redds (10 redds per kilometer) and one adult steelhead in the same reach of the Middle Fork San Pedro Creek. Numerous surveys of juvenile steelhead distribution and abundance have occurred in San Pedro Creek (Titus et al. 2010).

The main stem San Pedro Creek flows through dense residential housing for approximately 0.8 miles before reaching the project area. The topography of the action area consists of a natural stream channel with sporadically armored banks and low elevation changes throughout. Elevations range from approximately 45 feet above mean sea level (amsl) to about 70 amsl. Stream flow in the action area varies from intermittent flow in the summer to high flow events in the winter. The project area consists of riparian woodland, developed/landscaped, and perennial stream.

The channel bottom of San Pedro Creek is natural, though large debris such as pieces of concrete are present throughout. The banks of the creek are partially earthen and partially armored with rip-rap, concrete, and other manmade materials. The creek bottom is generally unvegetated to sparsely vegetated, while the unarmored banks are dominated by dense woody and herbaceous vegetation such as arroyo willow (*Salix lasiolepis*), American dogwood (*Cornus sericea*), California blackberry (*Rubus ursinus*), thimbleberry (*R. parviflorus*), stinging nettle (*Urtica dioica*), and English ivy (*Hedera helix*).

The riparian woodland is bordered on all sides by developed/landscaped areas. The overstory canopy is open-to-dense and comprised of a mix of species such as arroyo willow and Pacific willow (*S. lasiandra*). The understory is a diverse, dense assemblage of woody and herbaceous species such as those listed above.

2.4.1 Status of CCC steelhead trout in the Action Area

The San Pedro Creek steelhead population is a dependent population[2] within the Santa Cruz Mountains Diversity Stratum (NMFS 2016). Steelhead use the action area for spawning, rearing, and migration. During a 2019 site visit by the applicant's consultants, numerous juvenile salmonids – presumed by the observers to be *O. mykiss* – were observed throughout a reach that measured approximately 500 feet upstream and downstream of the project area (WRA, Inc., 2020). A watershed scale assessment conducted in 2001 found that the middle fork of San Pedro Creek (upstream of the project area) supports high densities of juvenile steelhead and indicated that the middle fork also contains the best spawning habitat in the watershed (Hagar Environmental Sciences 2002). The main stem San Pedro Creek – including the action area – also contains suitable spawning and rearing habitat. A 2004 watershed scale snorkel survey for steelhead found juvenile steelhead (young-of-year, age 1, and age 2) densities ranged from 0.28 to 1.5 fish per square meter (Johnson 2005).

2.4.2 Status of Critical Habitat in the Action Area

By the early 20th century, much of the mainstem of San Pedro Creek was channelized, and the extensive estuary and wetlands near the coast had largely been drained for agricultural production (Culp 2002, Davis 2004). Beginning in the 1950s, agriculture was replaced by extensive suburban and commercial developments as part of the City of Pacifica (now approximately 36 percent of the watershed area; NMFS 2016).

San Pedro Creek within the action area lacks large wood, off-channel habitat, and an extensive coniferous forest. Spawning, rearing, and migration habitat is present, but has been degraded from conditions known to support viable salmonid populations. Winter-rearing juvenile steelhead is the most limited life stage within San Pedro Creek due to degraded habitat conditions resulting in the loss of high velocity refugia (NMFS 2016).

2.4.3 Previous Section 7 Consultations and Section 10(a)(1)(A) Permits in the Action Area

No known previous Section 7 consultations have occurred within the action area. NMFS has issued section 10(a)(1)(A) research and enhancement permits and section 4(d) limits or exceptions for scientific research and monitoring that occur in the San Pedro Creek watershed. These activities are closely monitored and require measures to minimize take during the research activities.

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

[2] As defined in the Coastal Multispecies Recovery Plan (NMFS 2016), dependent populations are those likely to go extinct within a 100-year time period in isolation and rely on immigration for neighboring populations to persist.

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).

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

Construction activities, both during and post-project completion, associated with the proposed project may affect CCC steelhead trout and their designated critical habitat and CCC coho salmon designated critical habitat. The following may result from construction activities: unintentional direct injury or mortality during fish collection, relocations, and dewatering activities; temporary and permanent loss of benthic habitat; reductions on riparian vegetation and cover; temporary increases in suspended sediments; temporary and minor increases in hazardous materials and contaminants from heavy machinery and construction materials; and altered channel morphology.

2.5.1 Fish Collection and Relocation

To facilitate completion of the project, a portion of San Pedro Creek will need to be dewatered. As discussed above, approximately 55 linear feet of San Pedro Creek will be dewatered. The project proposes to collect and relocate fish in the work area prior to, and during, dewatering to avoid fish stranding and exposure to construction activities. Before and during dewatering of the construction site, juvenile CCC steelhead will be captured by a qualified biologist using a seine, dip net, and/or electrofishing. Collected juvenile CCC steelhead will be released to a suitable instream location. Since construction is scheduled to occur between June 15 and October 31, relocation activities will occur during the summer low-flow period after emigrating smolts have left the stream and before adults have initiated their spawning immigration to spawning. Only juvenile CCC steelhead are expected to be in the action area during the construction period. Therefore, NMFS expects capture and relocation of listed salmonids will be limited to juvenile pre-smolting and young-of-year CCC steelhead.

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 salmonid 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. Fish relocation activities will be conducted by qualified fisheries biologists following NMFS electrofishing guidelines (NMFS 2000), therefore, injury and mortality of juvenile CCC steelhead during capture and relocation is expected to be minimized. Based on prior experience with current relocation techniques and protocols likely to be used to conduct this fish relocation, unintentional mortality of juvenile CCC steelhead expected from capture and handling procedure is not likely to exceed 3 percent.

Relocated juvenile steelhead may also have to compete with other fish causing increased competition for available resources such as food and habitat. Responses to crowding by salmonids include self-thinning, resulting in emigration and reduced salmonid abundance with increased individual body size within the group, and/or increased competition (Keeley 2003). Some of the juvenile steelhead 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 juvenile steelhead moves, competition remains either localized to a small area or quickly diminishes as they disperse. In some instances, relocated juvenile steelhead may endure some short-term stress from crowding at the relocation sites. Such stress is not likely to be sufficient to reduce their individual fitness or performance. NMFS cannot accurately estimate the number of juvenile steelhead likely to be affected by competition, but does not expect this short-term stress to reduce the performance of individual juvenile steelhead, or have detrimental consequences to the overall watershed population because of the small area that will be impacted by the project and the anticipated few number of juvenile steelhead to be relocated. Juvenile steelhead that avoid capture during relocation may be exposed to risks described in the following section on dewatering (see Section 2.5.2 below).

To estimate the number of juvenile CCC steelhead that may be present in the action area, we used data from Johnson (2005) where he estimated juvenile steelhead density of 1.5 steelhead per square meter (or 1.5 juvenile steelhead per 10.7 square feet) in the main stem San Pedro Creek. Using this data, and the proposed dewatering length of 55 linear feet and 12.5 feet as the approximate average width of San Pedro Creek in the action area, NMFS estimates that no more than 97 juvenile CCC steelhead will be present in the dewatered area when relocation and dewatering activities occur.[3] Considering environmental variability including inter-annual variation in temperature, variations in predator or prey abundance, and habitat conditions in the action area, NMFS assumes that as many as 25 percent more juvenile steelhead may be present in the area to be dewatered. The 25 percent increase is based on NMFS' best professional judgement as to the likely variability in steelhead density between the time of the Johnson (2005) assessment and when construction begins (likely 2021 at the earliest). If 25 percent more than 97 juvenile steelhead are present this would result in 122 juvenile steelhead present in the 55-foot dewatered area.[4]

[3] 55 feet of creek length by 12.5 feet of creek width equals 687.5 square feet. (687.5 square feet *1.5 fish)/10.7 square feet equals 96.4 fish. Rounding this up to a whole number yields an estimate of 97 juvenile steelhead to be in the area during dewatering.

[4] (97*0.25) = 24.25. 97 + 24.25 = 121.25 (rounding up = 122).

Applying applicable avoidance and minimization measures to fish collection, relocation, and dewatering activities is expected to appreciably reduce the effects of project action on juvenile CCC steelhead. Specifically, fish collection and relocation activities conducted by a qualified biologist will ensure proper equipment operation and application of NMFS guidelines thereby minimizing injury and mortality to juvenile steelhead. Restricting the work window to June 15 through October 31 will limit the effects to stream rearing juvenile steelhead. NMFS expects applying avoidance and minimization measures will effectively minimize injury and mortality to juvenile CCC steelhead in the action area.

2.5.2 Project Site Dewatering

As described above, the project will require dewatering to complete. Sand bag cofferdams with a water bypass system (see Section 1.4 for details) will be used to temporarily divert flows around the work site during construction. NMFS anticipates temporary changes to instream flow within, and downstream, of the project site during installation of the diversion system, and during dewatering operations. Once the installation of the diversion system is complete, stream flow above and below the worksite will be the same as free-flowing pre-project conditions, except within the dewatered reach where stream flow is bypassed. The fluctuations in flow are anticipated to be small, gradual, and short-term, but are expected to cause a temporary loss, alteration, and reduction of aquatic habitat, and, in the case of areas that will be dewatered, will likely result in mortality of any juvenile steelhead that avoid capture during fish relocation activities.

Stream flow diversion and dewatering could harm individual rearing juvenile steelhead by concentrating or stranding them in residual wetted areas before they are relocated. Juvenile steelhead that avoid capture in the project work area will likely die during dewatering activities due to desiccation or thermal stress. Because the pre-dewatering fish relocation efforts will be performed by qualified biologists, NMFS expects the number of juvenile steelhead that will be killed as a result of stranding during dewatering activities will be very small, likely no more than one percent of the fish within the action area prior to dewatering.

Dewatering operations may affect benthic (bottom dwelling) aquatic macroinvertebrates; an important food source for salmonids. Benthic aquatic macroinvertebrates within the project site may be killed or their abundance reduced when river habitat is dewatered (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from stream flow diversions and dewatering will be temporary because construction activities will be relatively short lived and the dewatered reach will not exceed 55 linear feet. Rapid recolonization (typically one to two months) of disturbed areas by macroinvertebrates is expected following rewatering (Cushman 1985, Thomas 1985, Harvey 1986). In addition, the effect of macroinvertebrate loss on juvenile steelhead is likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream flow, if present, will be bypassed around the project work site. Based on the foregoing, juvenile steelhead are not anticipated to be exposed to a reduction in food sources from the minor and temporary reduction in aquatic macroinvertebrates as a result of dewatering activities.

Beyond the dewatered area, the temporary cofferdams in the action area are not expected to impact juvenile steelhead movements beyond that caused by typical summer low flow conditions. Diversion dams could restrict movement of juvenile steelhead in a manner similar to the normal seasonal isolation of pools by intermittent flow conditions that typically occur during summer within a portion of some streams through the range of CCC steelhead. Because the quality of habitat in and around the action area is adequate to support rearing steelhead, NMFS expects these fish will be able to find food and cover downstream of the action area as needed during dewatering activities.

2.5.3 Increased Sedimentation and Turbidity

The proposed project will result in disturbance of the streambed and banks for construction. Construction activities within the action area may result in disturbance of the dewatered stream bed and banks for equipment access, placement and removal of stream diversion structure, and sediment removal and placement. These activities are likely to dislodge previously armored and sequestered inter-gravel fine sediment allowing to be mobilized when the action area re-waters after in-water work is completed. Sediment may affect fish by a variety of mechanisms. High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelley 1961, Bjornn et al. 1977, Berg and Northcote 1985), reduce growth rates (Crouse et al. 1981), and increase plasma cortisol levels (Servizi and Martens 1992). High turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and can also cause fish mortality (Sigler et al. 1984, Berg and Northcote 1975, Gregory and Northcote 1993, Velagic 1995, Waters 1995). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation, decreasing chances of survival. Increased sediment deposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles (Alexander and Hansen 1986).

Although chronic elevated sediment and turbidity levels may affect steelhead and critical habitat, the temporary increase in sedimentation and turbidity resulting from the activities included in this project are not expected to rise to levels sufficiently high enough to adversely affect steelhead. Sedimentation and turbidity are most likely to increase during construction and removal of temporary water diversion structures, as well as during post-construction rewetting of the channel. The application of avoidance and minimization measures to all aspects of project planning, implementation, and cleanup is expected to substantially reduce or eliminate the impacts of sedimentation and turbidity on steelhead. Limiting the work window to June 15 through October 31 will limit any impacts to juvenile life stages. With erosion control best management practices and other avoidance and minimization measures, NMFS anticipates that any elevated turbidity levels would be small, temporary, and well below levels and durations shown to impact salmonids. NMFS expects any sediment or turbidity generated by the project would not extend more than 100 feet downstream of the work sites, based on methods used to control sedimentation and turbidity. Thus, NMFS does not anticipate this project to result in harm, injury, or behavioral impacts to juvenile steelhead associated with exposure to elevated suspended sediment levels that could reduce their survival chances.

2.5.4 Pollution from Hazardous Materials and Contaminants

Operating equipment in and near streams has the potential to introduce hazardous materials and contaminants into streams. The equipment needed to complete this project has the potential to releases debris, hydrocarbons, and similar contaminants into surface waters. Potentially hazardous materials include fuels and lubricants. Spills, discharges, and leaks of these materials can enter streams directly or via runoff. If introduced into streams, these materials could impair water quality. Oils and similar substances from construction equipment can contain a wide variety of polynuclear hydrocarbons (PAHs) and metals. PAHs can alter salmonid egg hatching rates and reduce egg survival as well as harm the benthic organisms that a salmonid food source (Eisler 2000).

These effects have the potential to harm or injure exposed fish and temporarily degrade habitat. However, proposed avoidance and minimization measures such as fueling, cleaning, or maintenance of vehicles or equipment will not take place within any areas where an accidental discharge may cause hazardous materials to enter waterways will substantially reduce or eliminate the potential for hazardous materials to enter waterways. Limiting the work window to the dry season from June 15 to October 31 will limit hazardous material exposure to juvenile steelhead and eliminate potential for contaminants to adversely affect the most sensitive life stages. Any equipment or vehicles used for this project will be checked and maintained daily to prevent leaks of fluids that could be deleterious to aquatic habitats. Proper storage, treatment, and disposal of construction materials and discharge management is expected to substantially reduce or eliminate contaminants entering streams via runoff. The project will include required spill control absorbent material for use beneath stationary equipment and be present on-site and available at all times. Due to these measures, conveyance of toxic materials into active waters during project construction is not expected to occur, and the potential for the project to degrade water quality and adversely affect salmonids is improbable.

2.5.5 Removal of Riparian Vegetation

No trees are anticipated to be removed as part of the project, though some willows will be trimmed. Additional vegetation clearing may occur as necessary to facilitate bank stabilization. Riparian vegetation disturbance and removal can degrade ecosystem functions and impair stream habitat. However, because trees will not be removed and removal of vegetation will be restricted to the minimum footprint necessary to complete the work, the scale of any impacts to reduced shade and cover from removal of riparian vegetation are not expected to significantly change the behavior of individual steelhead within the action area.

2.5.6 Critical Habitat Effects

The action area is within designated critical habitat for CCC steelhead trout and CCC coho salmon. Generally speaking, PBFs of critical habitat for both steelhead trout and coho salmon found within the action area include sites for migration, spawning, and rearing (see Section 2.4). Effects of the project on designated critical habitat include temporary disturbance to the streambed, bank, and flow from dewatering; temporary and permanent loss of riparian

vegetation; temporary elevated turbidity levels from suspended sediment; and loss of habitat from hard structure (headwall, rip-rap, etc.) installation.

Localized impacts to water quality in the form of increased levels of turbidity and suspended sediment will be contained during construction by the cofferdams and post-construction mobilization of sediment during high flow events are expected to be minimal. Suspended sediment and turbidity associated with the project will dissipate downstream during subsequent high flows over the next rainy season. Any sediment and turbidity generated from the project site during the next rainy season will likely be miniscule compared to the sediment and turbidity generated in San Pedro Creek during winter rains. The temporary exposure of approximately 687.5 square feet of channel in San Pedro Creek to increased sedimentation or turbidity is not expected to reach the scale where the physical or biological features of critical habitat will be altered, and therefore the ability of critical habitat to support listed species' conservation needs in the action area will be maintained.

PBFs of juvenile salmonid rearing habitat in the action area will be temporarily impacted by dewatering approximately 55 linear feet of San Pedro Creek. Approximately 687.5 square feet of habitat for rearing juveniles will not be available for approximately four weeks (20 work days) and food supplies within the dewatered reach will be temporarily reduced. Based on the rationale provided above in Section 2.5.3, NMFS similarly expects the temporary loss of habitat space and impacts to aquatic macroinvertebrates as a result of dewatering activities would result in only minor temporary reductions to rearing PBFs for salmonids in the action area. The ability of critical habitat to support listed species' conservation needs in the action area will be maintained.

The temporary water diversion and cofferdams are not expected to affect the critical habitat PBFs associated with migration because the diversion will not be in place during periods of adult and smolt migration in San Pedro Creek. Water diversion around the work site will be limited to the period between June 15 through October 31 when adults and smolts are no longer migrating and cofferdams will be removed prior to the beginning of adult or smolt migration of December through May (Fukushima and Lesh 1998).

Installation of the additional riprap and concrete pad/wall will increase the armoring in San Pedro Creek by 322 square feet. The placement of riprap and other hard structures in the streambank is anticipated to effect the channel by maintaining the alignment and precluding lateral movement of the channel. Natural fluvial and geomorphic processes in the action area have been comprised by previous bank hardening activities. Channels modified with hard materials create relatively simple and homogenous habitats that are less suitable for rearing salmonids (Schmetterking et al. 2001, Fischenich 2003, Hellmair et al. 2018). However, the action area includes the creek bank that has been modified by the existing outfall and bank protection. San Pedro Creek in the action area is constrained by urban development and therefore permanently impacting 0.03 acres of (primarily) stream bank is not expected to further degrade PBFs in the action area or result in adverse impacts to designated critical habitat.

2.6. Cumulative Effects

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

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

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 diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

CCC steelhead trout are listed as threatened and CCC coho salmon are listed as endangered. Based on the extensive loss of historic habitat due to dams, forestry practices, and urban and agricultural land development, and the degraded condition of remaining spawning and rearing habitats, CCC steelhead trout and CCC coho salmon have experienced severe declines. The most recent species status update concludes that steelhead in the CCC DPS remain "likely to become endangered in the foreseeable future", as new and additional information does not appear to suggest a change in extinction risk (Howe 2016).

Based on the type of activities, their size, scope, and location, many of the proposed activities are not expected to significantly impact CCC steelhead. However, fish capture and relocation activities will result in take (capture and mortality) of juvenile steelhead. NMFS expects up to 122 juvenile steelhead will be captured and 4 killed (3 percent of 122 estimated) from dewatering and relocation activities. Therefore, a primary risk assessment is whether the loss of these individuals will reduce appreciably the likelihood of both the survival and recovery of CCC steelhead in the wild by reducing its numbers, reproduction, or distribution. CCC coho salmon are not known to inhabit San Pedro Creek; therefore, they are not expected to be present within the action area.

Because of the relatively large numbers of juveniles produced by each spawning pair, steelhead spawning in San Pedro Creek in future years are likely to produce enough juveniles to replace the few that may be killed as a result of the proposed activities. Therefore, it is unlikely the loss of these individuals will reduce appreciably the likelihood of both the survival and recovery of CCC steelhead in San Pedro Creek.

The San Pedro Creek steelhead population is a dependent population within the Santa Cruz Mountains Diversity Stratum (NMFS 2016). Other watersheds, including those supporting independent populations are part of the diversity stratum which will not be affected by the proposed action and are expected to continue to contribute to this stratum's steelhead numbers, reproduction, and distribution. As a result, the CCC steelhead DPS numbers, reproduction, or distribution will not be appreciably reduced.

Regarding designated critical habitat, San Pedro Creek in the action area is constrained by urban development key factors. San Pedro Creek within the action area lacks large wood, off-channel habitat, and an extensive coniferous forest. Spawning, rearing, and migration habitat is present, but has been degraded from conditions known to support viable salmonid populations. Habitat for the winter-rearing juvenile steelhead life stage is the most limited due to current stream conditions and future threats in San Pedro Creek (NMFS 2016).

The condition of CCC coho salmon and CCC steelhead trout critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. Overall, the current condition of CCC coho salmon and CCC steelhead trout critical habitat likely cannot provide the conservation value necessary for the recovery of these species absent habitat restoration efforts.

The proposed action will cause temporary (i.e., dewatering) and permanent impacts (i.e., riprap installation). The negative impacts associated with this project are not expected to alter the current overall habitat conditions within the action area nor critical habitat at the Diversity Stratum and DPS/ESU population level. Therefore, the proposed action is unlikely to appreciably diminish the value of designated CCC steelhead trout or CCC coho salmon critical habitat.

Global climate change presents another significant threat to the long-term persistence of CCC steelhead trout, their designated critical habitat, and CCC coho salmon designated critical habitat, especially when combined with the current depressed population status and human caused impacts. Regional (i.e., North America) climate predictions for the mid-to-late 21st Century expect more variable and extreme inter-annual weather patterns, with a gradual warming pattern in general across California and the Pacific Northwest. However, extrapolating these general forecasts to our smaller action area is difficult, given local nuances in geography and other weather-influencing factors. Water temperatures may rise in the action area due to climate change over the next several decades, reinforcing the likelihood of reduced habitat production capacity.

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 steelhead, nor destroy or adversely modify its designated critical habitat.

After reviewing and analyzing the current status of the 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 destroy or adversely modify CCC coho salmon designated critical habitat.

2.9. Incidental Take Statement

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

2.9.1. Amount or Extent of Take

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

Take of listed juvenile CCC steelhead may occur during fish relocation and dewatering in a 55 linear foot reach at the project site between June 15 and October 31. The number of juvenile CCC steelhead that may be incidentally taken during dewatering activities is expected to be small, and limited to the pre-smolt life stage. NMFS expects that no more than 2 percent of juvenile steelhead within the 55 linear foot dewatering area of San Pedro Creek will be injured, harmed, or killed during fish relocation activities. NMFS also expects that no more than 1 percent of the juvenile steelhead within the 55 linear foot dewatering area of San Pedro Creek will be injured, harmed, or killed during dewatering activities. Because no more than 122 juvenile steelhead are expected to be present within the 55 linear foot dewatering reach, NMFS expects no more 4 juvenile CCC steelhead will be harmed or killed by the project. If more than 122 juvenile steelhead are captured or more than 4 juvenile steelhead are harmed or killed, incidental take will have been exceeded.

2.9.2. Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to CCC steelhead trout, or destruction or adverse modification of CCC steelhead trout and CCC coho salmon 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).

1. Undertake measures to ensure that harm and mortality to CCC steelhead resulting from project implementation is low.

2. Prepare and submit reports which summarize the effects of construction, fish relocation, dewatering activities, and post-construction site performance.

2.9.4. Terms and Conditions

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

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

    a. The City of Pacifica shall retain a qualified biologist with expertise in the areas of anadromous salmonid biology, including handling, collecting, relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. The City of Pacifica shall ensure that all fisheries biologists working on this project be qualified to conduct fish collections in a manner which minimizes all potential risks to ESA-listed salmonids.

    b. The fisheries biologist shall monitor the construction site during placement and removal of cofferdams and channel diversions to ensure that any adverse effects to salmonids are minimized. The biologist shall be on site during all dewatering events to ensure that all ESA-listed salmonids are captured, handled, and relocated safely. The Corps, the City, or the fisheries biologist shall notify a NMFS biologist at (707) 575-6066 or William.Stevens@noaa.gov one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities. During fish relocation activities the fisheries biologist shall contact NMFS staff at the above number if mortality of CCC steelhead exceeds 3 percent

of total steelhead collected, at which time NMFS will stipulate measures to reduce the take of CCC steelhead. If any CCC steelhead are found dead or injured, the fisheries biologist shall contact NMFS staff at the above number immediately. The purpose of the contact is to review the activities resulting death or injury and to determine if additional protective measures are required. All salmonid mortalities shall be retained, placed in an appropriately sized sealable plastic bag, labeled with the date and location of collection, fork length measured, and frozen as soon as possible. Frozen samples shall be retained by the biologist until specific instructions are provided by NMFS.

c. Non-native fish that are captured during fish relocation activities shall not be relocated to anadromous streams, or areas where they could access anadromous habitat.

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

    a. To ensure that crews will not work in San Pedro Creek until flows have subsided following a storm event between June 15 and October 31, the City shall contact NMFS Biologist at (707) 575-6066 or William.Stevens@noaa.gov on September 15, to provide a 7-day forecast relevant to the action area. Additionally, this notification shall:

        i. be provided on a weekly basis;

        ii. be used by NMFS to determine that conditions remain suitable for construction;

        iii. include a short description on remaining work to be completed, and an estimate of the number of days needed to complete remaining work.

    b. The City will allow any NMFS employee(s) or any other person(s) designated by NMFS to accompany field personnel to visit the project site during activities described in this opinion.

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

    a. The Corps or applicant must provide a written report to NMFS by January 15 of the year following construction of the proposed action. The report must be provided to NMFS North-Central Coast Office, Attention: Central Coast Branch Chief, USGS Pacific Coast & Marine Science Center, 2885 Mission Street, Santa Cruz, California 95050. The report must contain, at a minimum, the following information:

        i. **Construction Related Activities** – The report must 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 an effect on ESA-listed fish, the number of salmonids killed or injured during the project action, and photographs taken before, during, and after the activity from phot reference points.

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

2.10. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). NMFS has not conservation recommendations at this time.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Serra Drive Outfall Repair Project. As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the 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. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA , EFH means "those

waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the physical, biological, and chemical properties that are used by fish (50 CFR 600.10). 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) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH [CFR 600.905(b)]

This analysis is based, in part, on the EFH assessment provided by the Corps and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce.

3.1. Essential Fish Habitat Affected by the Project

Pacific Coast salmon EFH may be adversely affected by the proposed action. Specific habitats identified in the PFMC (2014) for Pacific Coast salmon include habitat areas of particular concern (HAPCs), identified as: 1) complex channels and floodplain habitats; 2) thermal refugia; and 3) spawning habitat.

3.2. Adverse Effects on Essential Fish Habitat

The potential adverse effects of the project on EFH have been described in the preceding biological opinion and included degraded water quality, benthic disturbance, and temporary and permanent loss of riparian vegetation. Therefore, the effects of the project on ESA-listed species are anticipated to be the same as the effects to EFH in the action area.

3.3. Essential Fish Habitat Conservation Recommendations

Because the proposed action includes appropriate avoidance and minimization measures and best management practices in the accompanying biological opinion that are sufficient to avoid, minimize, and/or mitigate for the anticipated effects, NMFS determined that no additional EFH Conservation Recommendations are necessary at this time that would otherwise offset the adverse effects to EFH.

3.4. Supplemental Consultation

The Corps 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 affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

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 are the Corps and the City of Pacifica. Other interested users could include the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, the Regional Water Quality Control Board, and Pacifica residents. Individual copies of this opinion were provided to the Corps. The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adheres to conventional standards for style.

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, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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