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

December 10, 2020 **Refer to NMFS No:** WCRO-2020-02314

Tom Holstein
Environmental Branch Chief
California Department of Transportation, District 4
P.O. Box 23660, MS-1A
Oakland, California 94623-6371

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Mountain View Road Bridge Replacement

Dear Mr. Holstein:

Thank you for the California Department of Transportation's (Caltrans)[1] August 6, 2020, letter (received via email on August 7, 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 Mountain View Road Bridge Replacement. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

The enclosed biological opinion is based on our review of Caltrans's proposed project and describes NMFS' analysis of potential effects on endangered Central California Coast (CCC) coho salmon (*Oncorhynchus. kisutch)*, threatened CCC steelhead (*O. mykiss*), and designated critical habitat for these species. NMFS concludes that 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 take of both species in the form of harm, injury, or mortality during dewatering and fish relocation activities. An incidental take statement with non-discretionary terms and conditions is included with the enclosed biological opinion.

NMFS also reviewed the likely effects of the proposed action on essential fish habitat (EFH), pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), and concluded that the action would adversely affect the EFH for Pacific Coast Salmon which are managed under the Pacific Coast Salmon Fishery Management Plan. Therefore, we have included the results of that review in Section 3 of this document. While the proposed project will result in adverse effects to EFH, the project description contains measures

[1] Pursuant to 23 USC 327, and through a series of MOUs beginning June 7, 2007, FHWA assigned and Caltrans assumed responsibility for compliance with Section 7 of the ESA and the MSA for federally-funded highway projects in California. Therefore, Caltrans is considered the federal action agency for consultations with NMFS for federally funded projects involving FHWA. Caltrans proposes to administer federal funds for the implementation of the proposed project. Thus, per the aforementioned MOU, Caltrans is considered the federal action agency for this project.

to minimize, mitigate, or otherwise offset the adverse effects; thus no EFH Conservation Recommendations are included in this opinion.

Please contact Jodi Charrier, North Central Coast Office in Santa Rosa, California at (707) 575-6069, or via email at Jodi.Charrier@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: Keevan Harding, Caltrans, Keevan.Harding@dot.ca.gov
Copy to E-File: ARN 151422WCR2020SR00175

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

Mountain View Road Bridge Replacement

NMFS Consultation Number: WCRO-2020-02314
Action Agency: California Department of Transportation (Caltrans)

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 coho salmon (*O. kisutch)*	Endangered	Yes	No	Yes	No
Central California Coast steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	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: December 10, 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 (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at NMFS North-Central Coast Office in Santa Rosa, California.

1.2. Consultation History

- August 7, 2020 – NMFS received an email from Caltrans that included: 1) a letter requesting initiation of Section 7 consultation for potential impacts on CCC coho salmon, CCC steelhead, and designated critical habitat due to the implementation of the proposed project; 2) the August 2020, Biological Assessment (BA) for the Mountain View Road Bridge (Federal Project No. BRLO-5927 (094)) (Caltrans 2020); and 3) Appendices for the BA. Though Caltrans did not specifically request an EFH consultation in their incoming request letter, effects to EFH were included in the BA.
- August 24 and 25, 2020 – NMFS requested the following information from Caltrans via email: on-site mitigation ratios for riparian vegetation and tree removal and photos representative of specific project components. NMFS also provided a non-concurrence statement for Caltrans' effects determination for critical habitat.
- August 27, 2020 – Caltrans provides requested mitigation ratio and photos. NMFS agreed to set Section 7 initiation date as August 7, 2020.
- September 2, 2020 – Caltrans provides change of effects determination from *may affect, not likely to adversely affect* to *may adversely affect, but not adversely modify* critical habitat for CCC coho salmon and CCC steelhead.

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

The County of Marin is proposing to replace an existing bridge over San Geronimo Creek on Mountain View Road in Marin County. The project will be implemented by the County, which has obtained grant authorization from Caltrans. The existing Mountain View Bridge was constructed in 1962 and does not meet American Association of State Highway and Transportation Officials standards due to narrow width. The bridge rails and approach guardrails consist of wooden railings which are also substandard.

The existing bridge (51 feet long by 11 feet wide) will be replaced with a new structure, comprised of one 12-foot-wide lane, 2-foot shoulders, and bridge railing for a total width of approximately 20 feet. The new 70-foot-long, single-span precast concrete bridge slab will shift 7 feet to the east and the roadway profile will be raised 4 feet. The proposed project will permanently impact approximately 0.04 acres and temporarily impact 0.12 acres of San Geronimo Creek. Work within San Geronimo Creek will include removal of the existing bridge, supports, and grouted riprap, installation of scour countermeasures, construction and use of a temporary instream roadway ramp, and construction of retaining walls. A temporary diversion within San Geronimo Creek will be used to complete these activities. Removal of several trees and riparian vegetation will also occur. No wetlands are present within the action area. Project construction is expected to begin in spring 2021 and be completed within six months.

Bridge Demolition and Construction

The existing bridge, including wingwalls, abutments, piers and foundations, will be demolished and fill will be removed from approximately 360 square feet. The new bridge will consist of precast abutments and wingwalls, supported on cast-in-drilled-hole piles (CIDH), precast voided slabs, and cast-in-place concrete deck and barrier railing. In order to install the CIDH piles, shafts will be drilled, a drill rig will place reinforcement cages for the piles, then each bored hole will be filled with concrete.

The roadway profiles of the approaches on Sir Frances Drake Boulevard, Mountain View Road, and Corona Avenue will be raised 4 feet and repaved. Construction of the roadway approaches will involve removing existing pavement and placing fill material, aggregate base, and asphalt pavement. Two retaining soldier pile walls will be constructed on the southern bank of San Geronimo Creek and consist of precast concrete lagging supported by steel ‘W’ beams in drilled holes. Each retaining wall will begin at an abutment wingwall and decrease in elevation with each pile. The left retaining wall on Mountain View Road will be 94 feet long and the right wall on Corona Avenue will run a total length of 44 feet.

Scour countermeasures consisting of 0.04 acres of vegetated rock slope protection (RSP) will be placed in front of both bridge abutments and retaining walls within the mean high water mark of San Geronimo Creek. An existing storm drain culvert running under Corona Avenue east will be replaced. Two storm drain pipe outlets into San Geronimo Creek will also be replaced and one new one installed concurrent with bridge construction. A 36-inch pipe will be placed under

Corona Avenue east and two 18-inch storm drain pipes will be placed under Sir Frances Drake on either side of Mountain View Road.

Dewatering and Fish Relocation

Cofferdams (6 feet wide by 4 feet tall) made of plastic-wrapped gravel bags, sheet piles, or steel plates will be installed and San Geronimo Creek will be diverted from approximately 135 feet upstream to 135 feet downstream from the drip line of the existing Mountain View Bridge. The water will flow downstream using a gravity fed or pumped bypass line. The bypass pipe diameter will be sized to accommodate twice the summer base flow and free-flowing water will be maintained at all times, including nights and weekends. The outlet of the water diversion will be positioned such that discharge maintains pre-project hydraulic conditions and does not result in bank erosion or channel scour. After dewatering the construction area, any ponded water will be pumped out with screened intakes with mesh not larger than 2.4 millimeters (3/32 inches) to create a dry working environment. A temporary roadway ramp constructed of 0.5 to 1 ton of native creek material and covering 15 cubic yards will be constructed in the dry creek bed. Trucks and heavy equipment will use this roadway while working in the creek area.

Fish rescue and relocation will be detailed in a Fish Handling Plan, to be developed in cooperation with NMFS prior to project implementation. Prior to installation of water diversion structures and prior to project activities, an agency-approved biologist will perform surveys for special-status species, place nets upstream and downstream to collect species, and relocate captured species to the nearest predetermined suitable habitat. Construction work will be coordinated with any fish relocation activities to avoid schedule conflicts. During holding and transportation, special-status species will be held in stream water collected from the project site. Fish screens made up of 1/8-inch hardware cloth will be placed above the origin and below the outlet of diversion.

The creek diversion and all equipment in the San Geronimo Creek will be removed from the channel by October 15 or as soon as project construction in the creek is complete. Water will slowly be released back into the work area as to prevent erosion and increased turbidity. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour.

Vegetation Removal

Six trees and up to 0.40 acres of riparian vegetation along San Geronimo Creek may be removed prior to construction. The following land cover types and acreages are within the action area and may be either temporarily or permanently impacted by the proposed project: California Bay Forest/California Buckeye Groves – 0.02 acres; Oregon Ash Forest/Red Alder Grove – 0.19 acres; Bigleaf Maple/Oregon Ash Forest – 0.19. The old bridge alignment will be remediated and replanted with native vegetation and trees. Specifications regarding vegetation and tree replanting will be provided during the design phase of the Project (estimated completion in 2020).

Conservation Measures

Section 1.3 of the BA is incorporated here by reference and describes several BMPs that will be implemented to avoid and minimize impacts to listed species and their habitat in the action area including, but not limited to:

- Work in the San Geronimo Creek channel will be restricted to the period from June 15 to October 15, when stream flow will be lowest. To the maximum extent practicable, no construction activities will occur during rain events or within 24 hours following a rain event.

- During in-water activities, a biologist will continuously monitor all activities (e.g., installation and removal of cofferdams and pipes) to ensure and undue impacts to listed species and their habitat will be avoided and minimized.

- A Worker Environmental Awareness Training will be provided to all construction personnel.

- A fish handling and relocation plan will be developed by the approved aquatic biologist in coordination with NMFS. Individual organisms will be relocated the shortest distance possible to an adjacent upstream area with sufficient aquatic habitat. Within occupied habitat, capture, handling, exclusion, and relocation activities will be completed no earlier than 48 hours before construction begins. If electrofishing is conducted, it must be performed by an approved biologist following NMFS guidelines (NMFS 2000).

  During fish relocation, all captured coho salmon and steelhead will be kept in cool, shaded, well-aerated water and protected from disturbance and overcrowding until they are released. To avoid predation, separate containers will be used: one for young-of-the-year coho and steelhead, and one for second- or third-year coho and steelhead. Captured fish will be relocated to suitable upstream rearing habitat that is as close to the dewatered area as possible while meeting the survival needs (adequate water quality/quantity, cover, and forage) of both the relocated individuals and the fish already inhabiting the relocation site.

- Pumped water will be discharged to a filtration system downstream of the work area to reduce turbidity or will be discharged to vegetated upland areas for infiltration. All sediment collected from dewatering will be disposed of off-site to an approved location. Pumps will be placed in flat areas away from the stream channel. To prevent movement caused by vibration, the pumps will be securely tied to a tree or stake. Pumps will be refueled in an area that is well away from the stream channel, and fuel absorbed mats will be placed under pumps while refueling. In no case will any sediment-laden or contaminated water be discharged directly to any waterway.

- Downed trees, stumps, boulders, suitable spawning sites, and other fish refugia will remain undisturbed as much as possible.
- Disturbance and removal of riparian, emergent, and aquatic vegetation and trees will be minimized. If riparian vegetation must be cut back, it will be to the minimum height necessary. Replacement of native vegetation will be planted in areas where roadway safety will not be affected. Trees will be replaced at a 3:1 ratio.

- RSP will be vegetated and installation will follow fish passage guidelines consistent with the *California Salmonid Stream Habitat Restoration Manual* (CDFW 2010) and the *NMFS Anadromous Salmonid Passage Facility Design* (NMFS 2011).

- Live willow cuttings will be used at the lower bank elevations just above the bank toe.

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 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 opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR 402.02). The designation(s) of critical habitat for (species) use(s) the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the

original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat. The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not change the scope of our analysis and in this opinion we use the terms "effects" and "consequences" interchangeably.

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

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

To conduct the assessment presented in this opinion, NMFS examined an extensive amount of information from a variety of sources. Detailed background information on the biology and status of the listed species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. Additional information regarding the potential effects of the proposed activities on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was formulated from the aforementioned resources, and the following:

- Biological Assessment: Mountain View Road Bridge Replacement Project, Marin County, California. Federal Project No. BRLO-5927(094). August 2020 (Caltrans 2020).
- NMFS Final Recovery Plan for Central California Coast coho salmon Evolutionarily Significant Unit. Southwest Region, Santa Rosa, California. September 2012 (NMFS 2012).
- NMFS Final Coastal Multispecies Recovery Plan: CC Chinook Salmon, Northern California Steelhead, CCC Steelhead. West Coast Region, Santa Rosa, California. October 2016 (NMFS 2016).
- NOAA Restoration Center's Programmatic Approach to ESA/EFH Consultation Streamlining for Fisheries Habitat Restoration Projects 2020 Annual Report for the San Geronimo Creek Habitat Enhancement Project (6355 Sir Francis Drake Boulevard).

For information that has been taken directly from published, citable documents, those citations have been reference in the text and listed at the end of this document. A complete administrative record of this consultation is on file at the NMFS North-Central Coast Office in Santa Rosa, California (Administrative Record Number 151422WCR2020SR00175).

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 PBFs that are essential for the conservation of the species.

NMFS assesses four population viability[2] 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 coho salmon ESU and CCC steelhead DPS and the factors responsible for the current status of these listed species.

We use these population viability parameters 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 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.

This opinion analyzes the effects of the proposed action on the following federally-listed species Ecologically Significant Unit (ESU), Distinct Population Segment (DPS), and designated critical habitat:

Central California Coast (CCC) coho salmon ESU
Endangered (70 FR 37160; June 28, 2005)
Critical habitat (64 FR 24049; May 5, 1999);

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

Central California Coast (CCC) steelhead DPS
Listing determination (71 FR 834; January 5, 2006)
Critical habitat designation (70 FR 52488; September 2, 2005).

2.2.1. CCC Coho Salmon Life History and Status

2.2.1.1 Coho Salmon Life History

In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple three year life cycle. Coho salmon are typically associated with medium to small 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. 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).

Female coho salmon choose spawning areas usually near the head of a riffle where small to medium gravel is present. Flow characteristics surrounding the redd usually ensure good aeration of eggs and embryos, and flushing of waste products. Preferred spawning grounds have: nearby overhead and submerged cover for holding adults; water depth of 4 to 21 inches; water velocities of 8 to 30 inches per second; clean, loosely compacted gravel (0.5 to 5 inch diameter) with less than 20 percent fine silt or sand content; cool water ranging from 39 to 50 degrees Fahrenheit (°F) with high dissolved oxygen of 8 mg/L; and inter-gravel flow sufficient to aerate the eggs. Lack of suitable gravel often limits successful spawning. The female may guard a redd for up to two weeks (Briggs 1953). Coho salmon may spawn in more than one redd and with more than one mate (Sandercock 1991). Coho salmon are semelparous meaning they die after spawning.

The eggs hatch after four to eight weeks, depending on water temperature. Survival and development rates depend on temperature and dissolved oxygen levels within the redd. McMahon (1983) found that egg and fry survival drops sharply when fine sediment makes 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 provide an optimum mix of high food availability and good cover with low swimming cost (Nielsen 1992).

As the fish continue to grow, they move into deeper water and expand their territories until, by July and August; they reside exclusively in deep pool habitat. Juvenile coho salmon prefer: well shaded pools at least 3.3 feet deep with dense overhead cover, abundant submerged cover (undercut banks, logs, roots, and other woody debris); water temperatures of 54° to 59° F (Brett 1952, Reiser and Bjornn 1979), but not exceeding 73° to 77° F (Brungs and Jones 1977) for extended time periods; dissolved oxygen levels of 4 to 9 mg/L; and water velocities of 3.5 to 9.5

inches per second in pools and 12 to 18 inches per second in riffles. Water temperatures for good survival and growth of juvenile coho salmon range from 50° to 59° F (Bell 1973, McMahon 1983). Growth slows considerably at 64° F and ceases at 68° F (Bell 1973).
Preferred rearing habitat has little or no turbidity and high-sustained invertebrate forage production. Juvenile coho salmon feed primarily on drifting terrestrial insects, much of which are produced in the riparian canopy, and on aquatic invertebrates growing within the substrate and in leaf litter in pools. As water temperatures decrease in the fall and winter months, fish stop or reduce feeding due to lack of food or in response to the colder water, and growth rates slow. During December through February, winter rains result in increased stream flows. By March, following peak flows, fish resume feeding on insects and crustaceans, and grow rapidly.

In the spring, as yearlings, juvenile coho salmon undergo a physiological process, or smoltification, which prepares them for living in the marine environment. They begin to migrate downstream to the ocean during late March and early April, and out-migration usually peaks in mid-May. The immature salmon initially remain in nearshore waters close to their parent stream and gradually move northward, staying over the continental shelf (Brown et al. 1994). Although they can range widely in the north Pacific, movements of coho salmon from California are poorly understood.

2.2.1.2 CCC Coho Salmon Status

Historically, the CCC coho salmon ESU was comprised 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. There are now 11 functionally independent populations (meaning they have a high likelihood of surviving for 100 years absent anthropogenic impacts) and one potentially independent population of CCC coho salmon (Spence et al. 2008, Spence et al. 2012). Most of the populations in the CCC coho salmon ESU are currently not viable, hampered by low abundance, range constriction, fragmentation, and loss of genetic diversity.

Brown et al. (1994) estimated that annual spawning numbers of coho salmon in California ranged between 200,000 and 500,000 fish in the 1940's. Abundance declined further to 100,000 fish by the 1960's, then to an estimated 31,000 fish in 1991. In the next decade, abundance estimates dropped to approximately 600 to 5,500 adults (NMFS 2005). CCC coho salmon have also experienced acute range restriction and fragmentation. 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 with no historical records. Recent genetic research has documented reduced genetic diversity within subpopulations of the CCC coho salmon ESU (Bjorkstedt et al. 2005), likely resulting from inter-breeding between hatchery fish and wild stocks.

Available data from the few remaining independent populations suggests population abundance continues to decline, and many independent populations essential to the species' abundance 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 to support dependent populations for several decades. The near-term (10 - 20

years) viability of many of the extant independent CCC coho salmon populations is of serious concern. These populations may not have sufficient abundance levels to survive additional natural or human caused environmental change. The overall risk of CCC coho salmon extinction remains high, and the most recent status review reaffirmed the ESU's endangered status (Rogers 2016).

The substantial decline in the Russian River coho salmon abundance led to the formation of the Russian River Coho Salmon Captive Broodstock Program in 2001. Under this Program, offspring of wild captive-reared coho salmon are released as juveniles into tributaries within their historic range with the expectation that some of them will return as adults to naturally reproduce. Coho salmon have been released into several tributaries within the lower Russian River watershed as well as in Salmon, Walker, and Redwood creeks.

The five CCC coho diversity strata defined by Bjorkstedt et al. (2005) no longer support viable populations. The Russian River and Lagunitas Creek populations are relative strongholds for the species compared to other CCC coho salmon populations. According to Williams et al. (2016), recent surveys suggest CCC coho salmon abundance has improved slightly since 2011 within several independent populations (including Lagunitas Creek), although all populations remain well below their recovery targets.. Within the Lost Coast – Navarro Point stratum, current population sizes range from 4 percent to 12 percent of proposed recovery targets. Recent sampling within Pescadero Creek and San Lorenzo River, the only two independent populations within the Santa Cruz Mountains strata, suggest coho salmon have likely been extirpated within both basins.

In positive developments, excess broodstock adults from the Russian River and Olema Creek were stocked into Salmon Creek and the subsequent capture of juvenile fish indicates successful reproduction occurred. Scott Creek experienced the largest coho salmon run in a decade during 2014/15, and researchers recently detected juvenile coho salmon within four dependent watersheds where they were previously thought to be extirpated (San Vincente, Waddell, Soquel, and Laguna creeks).

2.2.2. CCC Steelhead Life History and Status

2.2.2.1 Steelhead Life History

Steelhead are anadromous fish, spending some time in both fresh- and saltwater. The older juvenile and adult life stages occur in the ocean, until the adults move up freshwater streams to spawn. Eggs, alevins (gravel dwelling hatchlings), fry juveniles (newly emerged from stream gravels), and young juveniles all rear in freshwater until they become large enough to migrate to the ocean to finish rearing and maturing to adults. General reviews for steelhead in California document much variation in life history (Shapovalov and Taft 1954, Barnhart 1986, Busby *et al.* 1996, McEwan 2001). Although variation occurs in coastal California, steelhead usually live in freshwater for one to two years, then spend two or three years in the ocean before returning to their natal stream to spawn. Steelhead may spawn one to four times over their life

Steelhead fry rear in edgewater habitats and move gradually into pools and riffles, as they grow larger. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge

and as a means of avoiding predation (Shirvell 1990, Meehan and Bjornn 1991). Steelhead 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. Rearing steelhead juveniles prefer water temperatures of 45° to 58 °F and have an upper lethal limit of 75 °F (Barnhart 1986, Bjornn and Reiser 1991). They can survive in water up to 80.5 °F with saturated dissolved oxygen conditions and a plentiful food supply. Fluctuating diurnal water temperatures also aid in survivability of salmonids (Busby *et al.* 1996). Juvenile steelhead emigrate from natal streams during fall, winter, and spring high flows, to the ocean to continue rearing to maturity. Suspended sediment concentrations, or turbidity, also can influence the distribution and growth of steelhead (Bell 1973, Sigler *et al.* 1984, Newcombe and Jensen 1996).

Adults returning to spawn may migrate several miles to hundreds of miles in some watersheds, to reach their natal streams. Although spawning typically occurs between January and May, the specific timing of spawning may vary a month or more among streams within a region, and within streams inter-annually. Spawning (and smolt emigration) may continue through June (Busby *et al.* 1996). Female steelhead dig a redd in the stream and then deposit their eggs. After fertilization by the male, the female covers the redd with a layer of gravel. Steelhead do not necessarily die after spawning and may return to the ocean, sometimes repeating their spawning migration one or more years. The embryos incubate within the redd. Hatching time varies from about three weeks to two months depending on water temperature. The young fish emerge from the redd about two to six weeks after hatching.

2.2.2.2 CCC Steelhead Salmon Status

Historically, approximately 70 populations[3] 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, (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). Though still below historic levels, the trend of adult returns to the Warm Springs and Coyote Valley fish facilities on the Russian River has improved since the 1980's and 90's. 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, 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

[3] Population as defined by Bjorkstedt *et al*. 2005 and McElhaney *et al*. 2000 as, in brief summary, a group of fish of the same species that spawns in a particular locality at a particular season and does not interbreed substantially with fish from any other group. Such fish groups may include more than one stream.

(Bjorkstedt *et al*. 2005). In San Francisco Bay streams, reduced population sizes and fragmentation of habitat has likely also led to loss of genetic diversity in these populations.

A 2008 viability assessment of CCC steelhead concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable, and 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. New information from three years of the Coastal Monitoring Program in the Santa Cruz Mountains suggests that population sizes there are 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. Population-level estimates of adult abundance 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 since the previous status review assessment of Williams et al. (2011). 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 2016a). On May 26, 2016a, NMFS chose to maintain the threatened status of the CCC steelhead (81 FR 33468).

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 PBFs and 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:

- freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;
- 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,

    - 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;
- 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.

For CCC coho salmon critical habitat, the following essential habitat types were identified: 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 includes 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 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[4]: logging, agriculture, mining, urbanization, stream channelization and bank stabilization, 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 CCC coho salmon ESU and CCC steelhead DPS. Many coastal streams in California become partially dewatered during the warmest months of the year. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

2.2.3.1 *Additional Threats to Critical Habitat*

Another factor affecting the rangewide status of coho salmon and steelhead, and their critical habitat at large, is climate change. Impacts from global climate change are already occurring in California and listed salmonids here may have already experienced some detrimental impacts. For example, average annual air temperatures, heat extremes, and sea level have all increased in California over the last century (Kadir *et al.* 2013). California has a history of episodic droughts. However, the five-year period from 2012 to 2016 was the driest since record keeping began and 2014-2015 were the hottest years in the state's recorded history (Williams 2016).

[4] 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.

The threat to salmonids from global climate change will continue to 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 be comprised of higher temperatures (Hayhoe *et al.* 2004, Moser *et al.* 2012; Kadir *et al.* 2013). Total precipitation in California will likely decline and critically dry years may increase (Lindley *et al.* 2007; Schneider 2007; Moser *et al.* 2012).

For Northern California, most models project heavier and warmer precipitation. Extreme wet and dry periods are projected, increasing the risk of both flooding and droughts (DWR 2013). Many of these changes are likely to further degrade salmonid habitat by reducing stream flow during the summer and raising summer water temperatures. 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.

Wildfires are expected to increase in frequency and magnitude (Westerling *et al.* 2011, Moser *et al.* 2012). In 2020 the Walbridge fire alone burned over 55,000 acres and included approximately half of the CCC coho salmon spawning habitat available in the lower Russian River tributaries. In the same year, the CZU Lightning Complex fire burned 86, 500 acres in San Mateo and Santa Cruz Counties. Of the nine historic CCC coho populations in the Santa Cruz Mountains identified in the recovery plan, six experienced burning, of which three were severely burned. These three populations (Gazos Creek, Waddell Creek, and Scott Creek) represented some of the highest quality habitat for CCC coho south of San Francisco (J. Casagrande, personal communication 2020). The long-term impacts on such valuable salmonid habitat are yet to be determined. However, there is heightened concern related to increased sediment run-off and erosion, decreased riparian vegetation, increased stream temperatures, and decreased water quality.

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).

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 project is located on Mountain View Road just off of Sir Francis Drake Boulevard in Marin County in the community of Lagunitas-Forest Knolls. The action area (Figure 1) for the project is 2.31 acres and includes areas within the Caltrans and Marin County right-of-way. The action area encompasses all project improvements as well as space needed for potential construction access and staging, and

buffers around these areas to account for sensitive biological resources that may be adjacent to the project. Approximately 0.21 acres of San Geronimo Creek and 0.40 acres of riparian vegetation is contained within the action area and 270 linear stream feet will be dewatered.

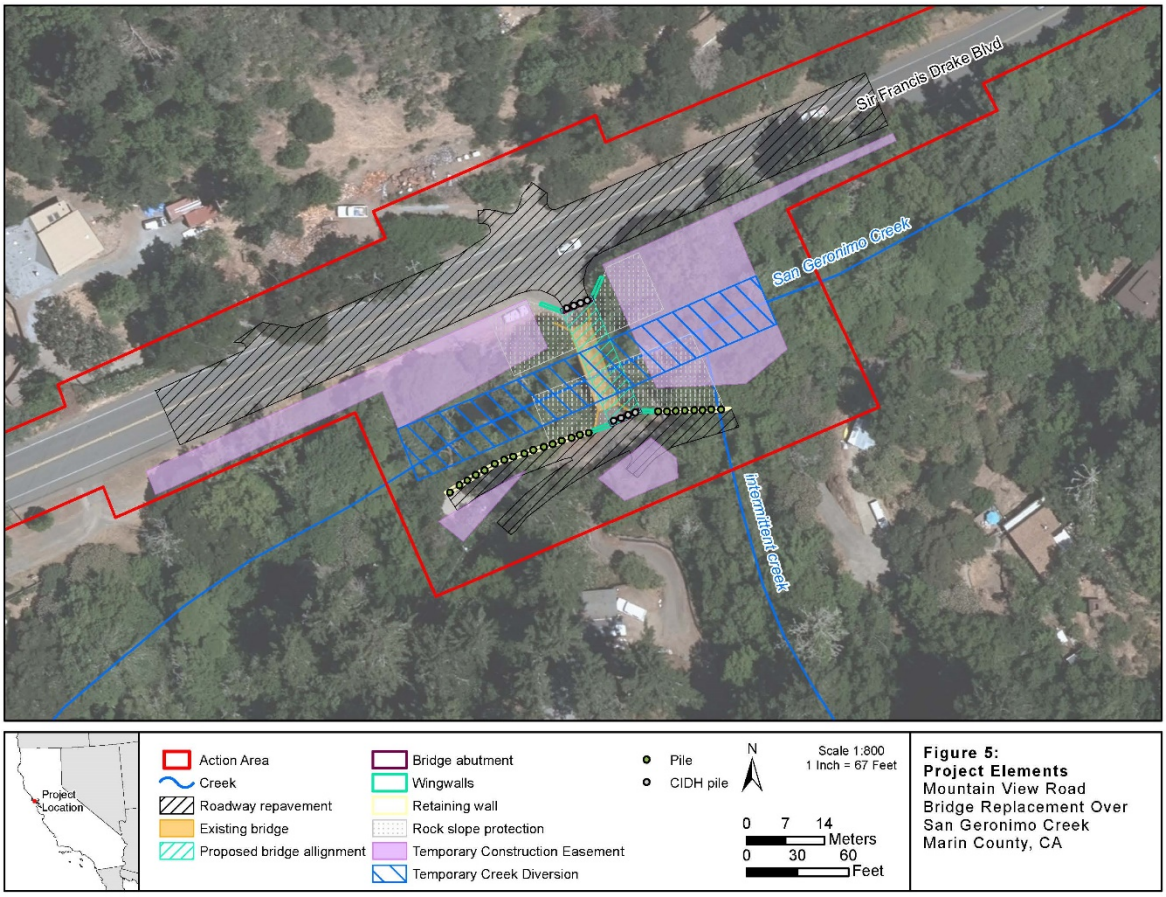

Figure 1. Action area and Project Elements for the Mountain View Road Bridge Replacement Project.

2.4. Environmental Baseline

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

2.4.1. Status of CCC Coho Salmon in the Action Area

The proposed project is in a segment of San Geronimo Creek, which is part of the larger Lagunitas Creek watershed that flows into Tomales Bay. The Lagunitas Creek watershed supports the southernmost, wild, independent, population of coho salmon along the Pacific Coast and is therefore considered critical to the survival and recovery of the species. The Lagunitas watershed supports approximately 10 percent of the remaining CCC coho salmon population. Records show coho salmon historically occupied at least 31 small coastal streams in Marin County and have recently been observed in only 17 (down by 455 percent) of these streams, most of which are tributaries to Lagunitas Creek (Moyle et al. 2008). Coho salmon are found consistently in Lagunitas Creek, as well as in Olema Creek, Devil's Gulch, and San Geronimo Creek and its tributaries, but less consistently in other smaller tributaries to Lagunitas Creek and Olema Creek (CDFW 2004). Although coho salmon are declining throughout the ESU, the Lagunitas Creek population is considered persistent and moderately abundant (NMFS 2012).

During the past three years of monitoring spawning adult coho salmon in the Lagunitas Creek watershed, the Marin Municipal Water District (MMWD) reported 292 coho redds and 537 live coho salmon from 2015 to 2016; 170 coho salmon redds and 499 live coho salmon from 2016 to 2017; and 110 coho salmon redds and 463 live coho salmon from 2017 to 2018 (MMWD 2016, 2018, 2019). During monitoring in 2017 to 2018, MMWD reported 60 percent of observed coho spawning in Lagunitas Creek, where 72 redds were observed. Of these, San Geronimo Creek, Devil's Gulch, and Olema Creek held 31 redds, and Cheda Creek and the small tributaries to San Geronimo Creek contributed seven redds (MMWD 2019).

In 2019, the Marin Resource Conservation District (MRCD) implemented a restoration project at 6355, Sir Francis Drake Boulevard, about 1.3 miles east of the proposed project. As part of this project, approximately 370 feet of San Geronimo Creek was dewatered from September 9 to 11, 2019, and fish were relocated downstream of the project site (including forty CCC coho).

Coho salmon can occur year-round in the action area, but are most likely to occur during spawning and migration events. No sampling surveys were conducted in San Geronimo Creek as part of the proposed project, but the stream reach is within a known spawning and rearing area. The action area, which includes an area 135 feet on either side of the existing bridge structure, does not include suitable spawning habitat. However, there is suitable rearing habitat for juvenile coho in this area which is a migration corridor for all life stages.

2.4.2. Status of CCC Steelhead in the Action Area

According to the recovery plan, the Lagunitas Creek watershed in the North Coast diversity stratum is considered an essential independent population with a low risk of extinction. Threats of the greatest concern within this population stratum are roads, urban development, agriculture, and channel modification. (NMFS 2016).

During the past three years of monitoring spawning adult steelhead in the Lagunitas Creek watershed, MMWD reported 120 steelhead redds and 43 live steelhead from 2015 to 2016; 35 steelhead redds and 23 live steelhead from 2016 to 2017; and 166 steelhead redds and 204 live

steelhead from 2017 to 2018 (MMWD 2016, 2018, 2019). The large steelhead run from 2017 to 2018 translated into one of the largest juvenile steelhead populations on record for the watershed (MMWD 2019).

In 2019, the MRCD implemented a restoration project at 6355, Sir Francis Drake Boulevard, about 1.3 miles east of the proposed project. As part of this project, approximately 370 feet of San Geronimo Creek was dewatered from September 9 to 11, 2019, and fish were relocated downstream of the project site (including 424 CCC steelhead).

This reach of San Geronimo Creek is within a known spawning and rearing areas for CCC steelhead. However, there is no suitable spawning habitat within the action area. There is suitable rearing habitat in this area which is a migration corridor for adults during the winter spawning season and for juveniles in other seasons.

2.4.3. Status of Critical Habitat in the Action Area

The action area is immediately surrounded by rural residential development in the community of Lagunitas-Forest Knolls. The proposed project is located adjacent to a series of local roads, including Sir Francis Drake Boulevard, Mountain View Road, and Corona Avenue. The construction of Kent Reservoir and Nicasio Reservoir blocked access to half of the historical salmonid habitat within the Lagunitas Creek watershed (NMFS 2012, NMFS 2016). There are no obstructions downstream that would prevent fish passage up to the action area.

A study of the Lagunitas Creek watershed documented winter habitat as a major limiting factor for coho salmon because they experience substantial annual population declines between fall and spring (Stillwater Sciences 2008). This is also true for steelhead and is due largely to poor woody debris recruitment and limited floodplain engagement (NMFS 2016). Fish passage barriers at road crossings, high fine sediment loads, low summer streamflow, high summer water temperature, a shortage of cover in the form of large woody debris, and loss of riparian vegetation are also impediments to critical habitat within the action area. The proposed project location is within a core priority area for protection and restoration as detailed in the CCC coho recovery plan (NMFS 2012).

2.4.4. Previous Section 7 Consultations Affecting the Action Area

No known previous Section 7 consultations have occurred within the action area.

2.4.5. Climate Change Impacts in the Action Area

The long-term effects of climate change have been presented under the Rangewide Status of the Species and Critical Habitat section of this opinion (2.2.3.1 *Additional Threats to Critical Habitat*). These include changes in streamflow regimes, water temperatures, and rainfall patterns. Listed species in the action area may have already experienced some detrimental impacts from climate change. These natural factors are likely less influential on fish abundance and distribution than anthropogenic impacts across the action area. Future climate change impacts in the action area are likely to increase as air and water temperatures warm, and

precipitation rates change. However, during the timeframe considered in this opinion, these changes are expected to materialize as insignificant alterations to current habitat conditions 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. Impacts to CCC Coho Salmon and CCC Steelhead

Due to the life history and habitat requirements of CCC coho salmon and CCC steelhead, construction activities (both during and post-project completion) associated with the proposed project may affect these listed species and their designated critical habitats in a similar manner. Therefore potential project impacts described below will pertain to both species. Only juvenile salmonids are expected to be in the action area during the project period (June 15 – October 15). NMFS expects pre-smolting and young-of-the-year juvenile CCC coho salmon and CCC steelhead may be exposed to the following stressors as a result of construction activities:

- unintentional direct injury or mortality during fish collection, relocations, and dewatering activities;
- temporary increases in suspended sediments, hazardous materials and contaminants from heavy machinery and construction materials;
- temporary and permanent loss of benthic habitat and altered channel morphology;
- increased temperature resulting from reductions in riparian vegetation and obstruction of flow;
- decreased macroinvertebrate communities (food source) in dewatered and riparian areas;
- competition with other juveniles at relocation sites.

The proposed project will require dewatering of approximately 270 feet of San Geronimo Creek and relocation of CCC coho salmon and CCC steelhead prior to construction. 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 fish 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 salmonids expected from capture and handling procedures is not likely to exceed two percent.

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

To estimate the number of juvenile CCC coho salmon and CCC steelhead that may be present in the action area prior to dewatering, we used data from MRCD's 2019 restoration project on San Geronimo Creek. This reference project was located at 6355 Sir Francis Drake Boulevard, about 1.3 miles east of the proposed project and contains similar habitat values as the action area. Prior to dewatering, 40 CCC coho and 424 CCC steelhead from approximately 370 feet of stream were relocated further downstream. If we use the MRCD project as a surrogate, and adjust for the 270 stream feet proposed for dewatering as part of the bridge replacement, approximately 29 CCC coho salmon and 309 CCC steelhead[5] are expected be present within the action area prior to construction.

Any listed fish residing within the project stream reach during and immediately after construction activities will likely experience short-lived, sub-lethal behavioral impacts (e.g., reduced feeding efficiency) due to temporarily increased levels of turbidity. These ephemeral turbidity impacts, lasting a couple to several hours, are not expected to reduce fish growth as feeding behaviors will quickly resume after the short pulse of turbidity. Moreover, due to the implementation of BMPs, the level of turbidity is expected to be slightly above background levels and well below levels found to injure or kill salmonids; impacted fish will more likely experience short-term behavioral effects, such as being forced to relocate to avoid the elevated turbidity, or experiencing reduced feeding efficiency if remaining in the turbid area. Caltrans proposes BMPs specifically aimed at reducing erosion and scour in storage and staging areas, riparian areas, and water diversions (Caltrans 2020). With the implementation of these BMPs, NMFS anticipates that any elevated turbidity levels would be small, temporary, and well below levels and durations shown to harm salmonids.

Operating equipment in and near streams has the potential to introduce hazardous materials and contaminants into streams. The equipment needed to complete the project has the potential to release debris, hydrocarbons, concrete, and similar contaminants into surface waters. Potentially hazardous materials include wet and dry concrete debris, 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 by altering the pH, reducing oxygen concentrations as the debris decompose, or by introducing toxic chemicals such as hydrocarbons or metals into aquatic habitat. Oils and similar substances form 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 are a salmonid food source (Eisler 2000). Disturbance of streambeds by heavy equipment or construction activities

[5] 40 CCC coho encountered/ 370 feet of dewatered stream = 0.11 coho per foot of stream (MRCD project). 0.11 coho per feet*270 feet = **29 coho per feet (proposed project);** 424 CCC steelhead encountered/370 feet of dewatered stream = 1.15 steelhead per feet of stream (MRCD project). 1.15 steelhead per feet*270 feet = **309 steelhead per feet (proposed project).**

can also cause the resuspension and mobilization of contaminated stream sediment with absorbed metals. These effects have the potential to harm or injure exposed fish and temporarily degrade habitat. However, proposed BMPs will substantially reduce or eliminate the potential for construction material and debris to enter waterways, degrade water quality, and adversely affect listed fish.

Reduced fitness and survival of CCC coho salmon and CCC steelhead due to loss of benthic habitat and channel alteration is expected to be minimal at both the individual and population level. Fish migrating through and rearing within the action area will experience degraded aquatic habitat caused by the project for varying durations. However, the installation of vegetated RSP or other hardening structures as part of the new bridge is not expected to be much larger or more robust than the existing structure(s). Approximately 0.04 acre of permanent impacts will result from the placement of RSP fill in habitat below the ordinary high water mark. The widened bridge deck will increase permanent shading over San Geronimo Creek by approximately 131 square feet. This small area is negligible compared to the remaining habitat available within San Geronimo and Lagunitas creeks.

Other impacts to CCC coho salmon and CCC steelhead may include changes in water temperature due to alteration or obstruction of flow and removal of thermal refugia including shade from riparian vegetation. Six trees and up to 0.40 acres of riparian vegetation along San Geronimo Creek may be removed prior to construction. Riparian vegetation helps maintain stream habitat conditions necessary for salmonid growth, survival, and reproduction. Riparian zones serve important functions in stream ecosystems such as providing shade (Poole and Berman 2001), sediment storage and filtering (Cooper et al. 1987, Mitsch and Gosselink 2000), nutrient inputs (Murphy and Meehan 1991), water quality improvements (Mitsch and Gosselink 2000), channel and stream bank stability (Platts 1991), source of woody debris that creates fish habitat diversity (Bryant 1983, Lisle 1986, Shirvell 1990), and both cover and shelter for fish (Wesche et al. 1987, Murphy and Meehan 1991).

Removal of riparian vegetation increases stream exposure to solar radiation, leading to increases in stream temperature (Poole and Berman 2001). Removal of riparian trees and vegetation within the work area will result in .04 acres of permanent and 0.12 acres temporary reductions in shade and cover for fish. While the loss of cover may cause individual fish to seek alternative areas where suitable cover exists nearby, such temporary displacement of fish is not expected to reduce their individual performance because there is cover nearby to accommodate additional individuals without becoming overcrowded. BMPs applied to all stages of project planning, implementation, and site restoration is expected to substantially reduce the impact of riparian vegetation removal on fish. The project site will also be monitored for five years following construction to ensure the success of revegetation efforts to restore areas temporary impacted from removal of riparian revegetation. Thus, impacts of reduced shade and cover from removal of riparian vegetation are not expected to significantly change rearing and migratory behavior of individual fish within the action area.

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 270 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 salmonids in likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream flow will be bypassed around the project work site. Therefore, juvenile fish 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.

Relocated CCC coho salmon and CCC 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 fish released at the relocation sites may choose to move 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 relocation should have similar water temperatures as the capture sites, and should have adequate habitat to allow for survival of transported fish. NMFS cannot accurately estimate the number of fish that may be affected by competition, but does not expect this short-term stress to reduce the individual performance of juvenile fish, or cascade through watershed population of these species based on the small area to be affected and the relatively small number of salmonids to be relocated.

2.5.2. Impacts to Critical Habitat

The action area within San Geronimo Creek is designated critical habitat for CCC coho salmon, and CCC steelhead. Generally speaking, PBFs of critical habitat for both species found within the action area include sites for migration and rearing. 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 during construction access and staging;
- temporary elevated turbidity levels from suspended sediment;
- permanent streambank and floodplain habitat degradation, precluding natural fluvial and geopmorphic channel dynamics.

For the same reasons described above, effects to critical habitat from project site dewatering, on critical habitat PBFs are expected to be temporary, insignificant, and will recover relatively quickly (one to two months) after the project site is re-watered. Similarly, for reasons described above, short-term turbidity from elevated levels of suspended sediment may slightly degrade the value of critical habitat in the action area, but only temporarily. Based on the size of the area to

be dewatered (270 linear feet) and stream and bank substrate conditions, NMFS expects turbidity after rewatering the project site to last for only a few hours. Turbidity and sediment deposited downstream resulting from this project are unlikely to significantly impact migration, spawning, or rearing PBFs in the action area.

Natural fluvial and geomorphic processes are important for maintaining PBFs of critical habitat. Streams transport water and sediment from upland sources to the ocean and, generally speaking, the faster the streamflow, the greater the erosive force. Natural processes constrain and moderate these erosive forces, such as when complex structure both within (*e.g.*, boulders or woody debris) and adjacent (*e.g.*, riparian vegetation) to the stream channel slows the water velocity and, by extension, its erosive force (Knighton 1998). Where existing geology and geomorphology allow, such as within the action area, a stream channel will also naturally "meander", eroding laterally to dissipate its hydraulic energy while creating a sinuous longitudinal course. Stream meandering efficiently regulates the erosive forces by lengthening the channel and reducing stream gradient, thus controlling the ability of the stream to entrain and transport available sediment. Meandering streams also create and maintain both the hydraulic and physical components of instream habitat used by fish and other aquatic species. For instance, specific to steelhead, a meandering, unconstrained stream channel sorts and deposits gravel and other substrate necessary for optimal food production and spawning success, maintains a healthy and diverse riparian corridor that supplies LWD, and allows floodplain engagement during appropriate winter flows (Spence *et al.* 1996).

By design, infrastructure projects within the stream prevent lateral channel migration, effectively forcing streams into a simplified linear configuration that, without the ability to move laterally, instead erode and deepen vertically (Leopold *et al*. 1968; Dunn and Leopold 1978). The resulting "incised" channel fails to create and maintain aquatic and riparian habitat through lateral migration, and can instead impair groundwater/stream flow connectivity and repress floodplain and riparian habitat function. The resulting simplified stream reach typically produces limited macroinvertebrate prey and poor functional habitat for rearing juvenile salmonids (Florsheim *et al*. 2008). Bank stabilization composed of RSP is typically designed to withstand high streamflow caused by large storm events. The RSP structure, and resulting impacts to instream habitat, are everlasting, harming fish generations well into the future. Streambank stabilization impacts not only extend temporally, but altered geomorphic and hydraulic processes can also propagate spatially (both upstream and downstream of hardened bank structures), dependent upon site- and structure-specific characteristics (Henderson 1986 and Arnaud-Fassetta *et al.* 2005, as cited in Florsheim *et al.* 2008), meaning that "bank stabilization often begets more bank stabilization." RSP and other hardened features immediately and permanently replaces a natural earthen streambank, which can provide complex fish habitat (*e.g.*, undercut banks, submerged rootwads, *etc.*) (Fischenich and Copeland 2001), with a relatively simple streambank structure less suitable for juvenile steelhead (Schmetterling *et al.* 2001; Fischenich 2003).

While 0.04 acre of vegetated RSP will be permanently placed within critical habitat, this will not exclude juvenile or adult steelhead from using San Geronimo Creek for rearing and passage. Also, approximately 360 square feet of fill will be removed from the existing bridge site resulting in little change from existing conditions. The action area is not believed to contain suitable habitat for spawning, therefore, no impacts to spawning habitat is expected occur.

Adverse effects to critical habitat will result in both temporary and permanent habitat loss, but the amount of habitat lost compared to available habitat in the surrounding area is small and areas will be restored onsite. Therefore, the project is unlikely to compromise the value of available critical habitat in the action area for spawning, migrating, and rearing.

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. NMFS does not anticipate any cumulative effects in the action area.

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.

2.7.1. CCC Coho Salmon and CCC Steelhead

As independent populations, federally endangered CCC coho salmon and threatened CCC steelhead within the Lagunitas Creek watershed, including San Geronimo Creek, are important to the recovery of the ESU and DPS, respectively. Many independent populations of CCC coho salmon that supported the species' overall numbers and geographic distributions in the past have been extirpated and steelhead numbers are substantially reduced from historic levels. The Lagunitas Creek watershed supports approximately 10 percent of the remaining CCC coho salmon population. This population is also considered the southernmost wild, independent population along the Pacific Coast and is critical to the survival and recovery of the species. The proposed project location is within a core priority area for protection and restoration as detailed in the CCC coho recovery plan (NMFS 2012).

The number of CCC coho salmon and CCC steelhead that may be adversely affected or killed during project activities is expected to make up a very small portion of the individuals within the action area, a smaller portion of the Lagunitas watershed population, and subsequently an even smaller portion of the overall CCC ESU and DPS. Due to the numbers of juveniles produced by each spawning pair of adult coho salmon and steelhead, spawning in the Lagunitas watershed in future years is expected to produce enough juveniles to replace those that may be killed during project activities. It is unlikely that the small potential loss of juveniles by this project would impact future adult returns to impact the populations' resilience and persistence over time. Because the quality of habitat in and around the action area is adequate to support rearing salmonids, NMFS expects these fish will be able to find food and cover downstream of the action area as needed during dewatering activities. Consequently, we do not expect the project to affect the persistence or recovery of the CCC coho salmon ESU or CCC steelhead DPS.

Global climate change presents another real threat to the long-term persistence of CCC coho salmon and CCC steelhead, especially when combined with the current depressed population status and human caused impacts. Regional (*i.e.,* North America) climate projections 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 somewhat in the action area due to climate change over the next several decades, reinforcing the likelihood of reduced carrying capacity in the action area due to loss of riparian habitat as described above.

2.7.2. CCC Coho Salmon and CCC Steelhead Critical Habitat

While conditions vary across the ESU and DPS, designated critical habitat for CCC coho salmon and CCC steelhead is generally impaired by: logging, agriculture, mining, urbanization, stream channelization and bank stabilization, dams, wetland loss, and water withdrawals. These factors also affect the critical habitat designated in the Lagunitas Creek watershed which may be affected via fish passage barriers, high fine sediment loads, low summer streamflow, high summer water temperature, a shortage of cover in the form of large woody debris, and loss of riparian vegetation.

The proposed project will degrade PBFs of designated critical habitat in the action area, namely those related to juvenile rearing. The proposed project is replacing an existing structure and will result in little net loss or degradation of the currently existing habitat. The majority of the project's impacts to critical habitat will be temporary, and temporarily disturbed habitat will be restored upon completion. While approximately 0.04 acre of vegetated RSP will be permanently placed within critical habitat, this will not exclude juvenile or adult coho from using San Geronimo Creek for rearing and passage and no impacts to suitable spawning habitat will occur. NMFS expects any water quality impacts will be temporary and are not expected to adversely affect PBFs of CCC coho salmon or CCC steelhead critical habitat because aquatic habitat in the action area will return to ambient conditions in a few weeks following bridge replacement.

The effects of the proposed action, when added to the environmental baseline, cumulative effects, and species status, are not expected to appreciably reduce the quality and function of

critical habitat at the larger CCC coho salmon, ESU or CCC steelhead DPS, given the small area being degraded compared to the quality and quantity of habitat within the Lagunitas watershed. Thus, the proposed action will not impair the ability of critical habitat to play its intended conservation role of supporting populations of CCC coho salmon and CCC steelhead at the ESU and DPS levels.

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 or CCC steelhead or destroy or adversely modify designated critical habitat for these species.

2.9. Incidental Take Statement

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

2.9.1. Amount or Extent of Take

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

Take of listed juvenile CCC coho salmon and CCC steelhead may occur during fish relocation and dewatering in a 270-linear-foot-reach at the project site between June 15 and October 15. The number of CCC coho salmon that may be incidentally taken during dewatering activities is expected to be small, and limited to the pre-smolt and young-of-year juvenile life stage. NMFS expects that no more than 2 percent of juvenile salmon within the 270-linear-foot dewatering area of San Geronimo will be injured, harmed, or killed during fish relocation activities. NMFS also expects that no more than 1 percent of the fish within the 270 linear foot dewatering area of San Geronimo Creek will be injured, harmed, or killed during dewatering activities. Because no more than 29 juvenile coho salmon are expected to be present within the 270 linear foot dewatering reach (see Section 2.5), NMFS expects no more than one juvenile CCC coho salmon

will be harmed or killed by the project. If more than 29 juvenile coho salmon are captured or more than one juvenile coho salmon is harmed or killed, incidental take will have been exceeded.

Similarly, the number of CCC steelhead that may be taken during fish relocation and dewatering is expected to be low and will be limited to the pre-smolt and young-of-year juvenile life stage. NMFS expects that no more than 2 percent of juvenile steelhead within the 270-linear-foot dewatering area of San Geronimo will be injured, harmed, or killed during fish relocation activities. NMFS also expects that no more than 1 percent of the fish within the 270 linear foot dewatering area of San Geronimo Creek will be injured, harmed, or killed during dewatering activities. Because no more than 309 juvenile steelhead are expected to be present within the 270 linear foot dewatering reach (see Section 2.5), NMFS expects no more than 10 juvenile CCC steelhead will be harmed or killed by the project. If more than 309 juvenile steelhead are captured or more than 10 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 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 RPMs are necessary and appropriate to minimize take of CCC coho salmon and CCC steelhead:

1. undertake measures to ensure that injury and mortality to salmonids resulting from fish relocation and dewatering activities is low;

2. undertake measures to minimize harm to salmonids from construction of the project and degradation of aquatic habitat;

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

2.9.4. Terms and Conditions

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

1. The following terms and conditions implement RPM1:

    a. Caltrans shall retain a qualified biologist with expertise in the areas of salmonid biology, including handling, collecting, and relocating; habitat relationships; and biological monitoring. The applicant 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. Electrofishing, if used, shall be performed by a qualified biologist and conducted according to the *NOAA Fisheries Guidelines for Electrofishing Waters Containing Salmonids Listed* under the Endangered Species Act, June 2000.

    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 in anadromous fish streams to ensure that all ESA-listed salmonids are captured, handled, and relocated safely. Caltrans or the fisheries biologist shall notify NMFS at (707) 575-6069 or jodi.charrier@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 federally listed salmonids exceeds 3 percent of the total for each species collected, at which time NMFS will stipulate measures to reduce the take of salmonids.

    c. Any pumps used to divert live stream flow will be screened and maintained throughout the construction period to comply with NMFS' Fish Screening Criteria for Anadromous Salmonids (2000).

    d. If ESA-listed fish are handled, it shall be with extreme care and they shall be kept in water to the maximum extent possible during rescue activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream and fish shall not be removed from this water except when released. To avoid predation the biologist shall have at least two containers and segregate young-of-year salmonids from larger age-classes and other potential aquatic predators. Captured salmonids will be relocated as soon as possible to a

suitable instream location (pre-approved by NMFS) where suitable habitat conditions are present to allow for survival of transported fish and fish already present.

e. 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 RPM 2:

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

   b. To ensure that the project is built as designed and contractors adhere to construction best management practices, monitoring will be performed during construction by skilled individuals. Monitors will be knowledgeable in the project designs, construction minimization measures, and the needs of listed fish species. Monitoring will be performed daily. The monitor(s) will work in close coordination with project management personnel, the project design (engineering) team, and the construction crew to ensure that the project is built as designed.

   c. Construction equipment used within the river channel will be checked each day prior to work within the river channel (top of bank to top of bank) and, if necessary, action will be taken to prevent fluid leaks. If leaks occur during work in the channel, Caltrans or their contractors will contain the spill and removed the affected soils.

   d. Once construction is completed, all project-introduced material must be removed, leaving the river as it was before construction. Excess materials will be disposed of at an appropriate disposal site.

3. The following terms and conditions implement RPM 3:

   a. **Project Construction and Fish Relocation Report** – Caltrans must provide a written report to NMFS by January 15 of the year following construction (2022). The report must be submitted to NMFS' North-Central Coast Office, Attention: Central Coast Branch Chief, 777 Sonoma Avenue, Room 325, Santa Rosa, California, 95404-6528. The report must contain, at minimum, the following information:

      i. **Construction related activities** – The report(s) must include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, including a description of any and all measures taken to minimize

those unanticipated effects and a statement as to whether or not the unanticipated effects had any effect on ESA-listed fish; the number of salmonids killed or injured during the project action; and photographs taken before, during , and after the activity from photo reference points.

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

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

i. **Post-Construction Vegetation Monitoring and Reporting** – Caltrans must develop and submit for NMFS' review, a plan to assess the success of the revegetation of the site. A draft of the revegetation monitoring plan must be submitted to NMFS for review and approval three months prior to the beginning of project construction (i.e., must be submitted March 15, 2021, which is three months before the proposed June 15, 2021 start date). Reports documenting post-project conditions of vegetation installed at the site will be prepared and submitted annually for the first five years following project completion, unless the site is documented to be performing poorly, then monitoring requirements will be extended. Reports will document vegetation health and survivorship and percent cover, natural recruitment of native vegetation (if any), and any maintenance or replanting needs. Photographs must be included. If poor establishment is documented, the report must include recommendations to address the source of the performance problems.

2.10. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

NMFS recommends Caltrans purchase conservation bank credits at a NMFS-approved conservation bank for the following: (1) permanent loss of natural streambank and channel processes; and (2) temporary loss of cover and forage habitat due to rip-rap armoring.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Mountain View Road Bridge Replacement Project. As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

3. 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 Caltrans and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the fishery management plans developed by the Pacific Fisheries Management Council (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. HAPCs for coho salmon include all waters, substrates, and associated biological communities falling within critical habitat areas described above in the accompanying biological opinion for the project located on the San Geronimo Creek. Essentially, all CCC coho salmon habitat located within the proposed action is considered HAPC as defined in PFMC (2014).

3.2. Adverse Effects on Essential Fish Habitat

The potential adverse effects of the project on EFH have been described in the preceding opinion and include degraded water quality, benthic disturbance, and temporary 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

Section 305(b)(4)(A) of the MSA authorizes NMFS to provide EFH Conservation Recommendations that will minimize adverse effects of an activity on EFH. Although temporary potential adverse effects are anticipated as a result of the project activities, the proposed minimization and avoidance measures, and best management practices in the accompanying biological opinion are sufficient to avoid, minimize, and/or mitigate for the anticipated affects. Therefore, no additional EFH Conservation Recommendations are necessary at this time that would otherwise offset the adverse effects to EFH.

3.4. 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 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 specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these components, documents compliance with the Data Quality Act, 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 and individual copies of this opinion were provided to the Caltrans. 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 implementation and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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