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

July 12, 2023 **Refer to NMFS No:** WCRO-2023-00634

Darrell Cardiff
Environmental Branch Chief
California Department of Transportation – District 1
1656 Union Street
Eureka, California 95501

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Reinitiation of Eureka Hill Seismic Retrofit Project

Dear Mr. Cardiff:

Thank you for your letter of May 12, 2023, 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 reinitiation of Eureka Hill Seismic Retrofit Project in Mendocino County, California.

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

The enclosed biological opinion is based on our review of the California Department of Transportation's (CalTrans)[1] proposed project and describes NMFS' analysis of potential effects on endangered Central California Coast (CCC) coho salmon (*Onchorhynchus. kisutch)*, threatened Northern California (NC) steelhead (*O. mykiss*), and California Coastal (CC) Chinook salmon (*O. tshawytscha)*, and on designated critical habitat in accordance with section 7 of the ESA.

In this biological opinion, we conclude that the proposed action is not likely to jeopardize the continued existence of CCC coho salmon, NC steelhead, or CC Chinook salmon. We also conclude the proposed action is not likely to result in the destruction or adverse modification of designated critical habitat for these listed species. However, NMFS anticipates that incidental take of CCC coho salmon, NC steelhead, and CC Chinook salmon is reasonably certain to occur as a result of the proposed action. Therefore, an incidental take statement with terms and conditions is included with the enclosed biological opinion.

[1] Caltrans is acting as the lead agency under direction of the June 2007 Memorandum of Understanding (MOU) (23 U.S. C. 326) between Caltrans and the Federal Highway Administration. As assigned by the MOU, Caltrans is responsible for the environmental review, consultation and coordination on this project.

NMFS has reviewed the proposed project for potential effects on EFH and determined that the proposed project would adversely affect EFH for Pacific Coast Salmon, which are managed under the Pacific Coast Salmon Fishery Management Plan. While the proposed action will result in adverse effects to EFH, the proposed project contains measures to minimize, mitigate, or otherwise offset the adverse effects; thus, no EFH Conservation Recommendations are included in this opinion.

Please contact Andrew Trent at (707) 578-8553 or andrew.trent@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Vincent Heim, Caltrans District 1, Eureka CA, Vincent.Heim@dot.ca.gov
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e-file FRN 151422WCR2023SR00105

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

Reinitiation Eureka Hill Seismic Retrofit Project

NMFS Consultation Number: WCRO-2023-000634
Action Agency: California Department of Transportation

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?
CCC coho salmon (*Oncorhynchus kisutch)*	Endangered	Yes	No	No	No
NC steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	No	No
California Coastal Chinook Salmon (*Oncorhynchus tshawytscha*)	Threatened	Yes	No	No	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: July 12, 2023

TABLE OF CONTENTS

1. Introduction 1

1.1. Background 1

1.2. Consultation History 1

1.3. Proposed Federal Action 2

1.3.1. Construction Activities 2

1.3.2. Workpad Installation and Stream Diversion and Dewatering Plan 3

1.3.3. California Endangered Species Act Conformance 4

1.3.4. Avoidance and Minimization Measures 5

2. Endangered Species Act: Biological Opinion And Incidental Take Statement 5

2.1. Analytical Approach 6

2.1.1. Use of Best Available Scientific and Commercial Information 7

2.2. Rangewide Status of the Species and Critical Habitat 7

2.2.1. General Life History of Listed Species 8

2.2.2. CCC Coho Salmon 9

2.2.3. CC Chinook Salmon 11

2.2.4. Critical Habitats 12

2.2.5. Global Climate Change 13

2.3. Action Area 14

2.4. Environmental Baseline 14

2.4.1. Status of Listed Species and Critical habitat in the Action Area 15

2.4.2. Factors Affecting Species and Habitat within the Action Area 16

2.5. Effects of the Action 16

2.5.1. Fish Relocation Activities 17

2.5.2. Stream Diversion and Dewatering 18

2.5.3. Noise Impacts 19

2.5.4. Sedimentation and Turbidity 19

2.5.5. Hazardous Materials and Contaminants. 20

2.5.6. Effects to Critical Habitat 20

2.6. Cumulative Effects 21

2.7. Integration and Synthesis 21

2.8. Conclusion 22

2.9. Incidental Take Statement 22

2.9.1. Amount or Extent of Take 23
2.9.2. Effect of the Take 23
2.9.3. Reasonable and Prudent Measures 23
2.9.4. Terms and Conditions 24
2.10. Conservation Recommendations 26
2.11. Reinitiation of Consultation 26
3. Data Quality Act Documentation and Pre-Dissemination Review 26
3.1. Utility 26
3.2. Integrity 27
3.3. Objectivity 27
4. References 27
4.1. Federal Register Notices 36

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 U.S.C. 1531 et seq.), as amended, and implementing regulations at 50 CFR part 402.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available 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 California Coastal NMFS office.

1.2. Consultation History

On May 1, 2014, NOAA's National Marine Fisheries Service (NMFS) received the California Department of Transportation's (Caltrans) April 28, 2014, letter requesting initiation of formal consultation under section 7 of the ESA for the seismic retrofit of the Eureka Hill Road Bridge (Project). Caltrans requested formal consultation because the proposed Project was likely to adversely affect listed salmonids and critical habitat. After reviewing the Biological Assessment (BA), NMFS found the initiation package complete and initiated formal consultation on May 5, 2014. NMFS visited the Eureka Hill Bridge on May 20, 2014, and, based on site conditions, estimated relatively high summer numbers of listed juvenile salmonids in the proposed dewatered area. NMFS recommended additional measures to offset anticipated project effects to these salmonids and on May 29, 2014, Caltrans and the Mendocino County Department of Transportation (MCDOT) added large woody debris installation to the project description.

A BA was previously prepared for the Project in April 2021 that included a statement describing conformity with the requirements of the CESA for appropriate avoidance, minimization, and mitigation measures incorporated into the proposed action to address potential effects to CCC coho. This was done to provide the appropriate language for CDFW to issue a Consistency Determination (CD) consistent with Section 2080.1 of the California Fish and Game Code. On May 5, 2021 Caltrans contacted NMFS staff via email requesting additional information to be included into the June 25, 2014 Biological Opinion (WCR-2014-834) for the Eureka Hill Seismic Retrofit Project. After correspondence between Caltrans and CDFW councils, NMFS issued a letter on July 7, 2021 amending the June 25, 2014 Biological Opinion to include language regarding financial assurances for the proposed bridge project. Subsequent to NMFS first letter regarding CDFW's consistency determination, the County of Mendocino requested an amended Incidental Take Statement (ITS) and additional information be included in the original 2014 biological opinion. NMFS provided Caltrans and the County with two letters on March 9, 2022, an amended ITS, and a letter which included specific language regarding the Master

Funding Agreement between CDFW and Caltrans. These NMFS response letters were sufficient for CFDW to provide Caltrans with a consistency determination on June 16, 2022.

This Project went to construction in late summer 2022 but was unable to complete the work due to feasibility issues with the water diversion and dewatering efforts. During this unsuccessful effort, one juvenile NC steelhead was captured and returned to the creek unharmed, while no CCC coho or CC Chinook were captured. Construction was then halted and postponed until summer of 2023. The water diversion and dewatering plan has since been redesigned; the actual Project design remains unmodified. This BA Addendum, which was sent to NMFS for review on April 26, 2023, addresses these changes and their effects to FESA and CESA listed species. Following NMFS review of the BA Addendum, Caltrans requested reinitiation of formal consultation via letter on May 12, 2023.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the biological opinion and incidental take statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

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 (see 50 CFR 402.02). Caltrans and MCDOT propose to use FHWA funds to retrofit the seismically deficient Eureka Hill Road Bridge. The bridge is located where Eureka Hill Road crosses the Garcia River, approximately five miles east of the City of Point Arena in southwestern Mendocino County, California. The Project will be implemented by MCDOT and involve some use of heavy equipment (excavator, auger, etc.). Proposed retrofit activities within the Garcia River channel and riparian area will primarily involve dewatering approximately 90 linear feet of channel and the addition of foundation piles to existing bridge piers and abutments. The bridge will remain open to traffic during construction activities and all work within the channel will take place in one work season, between June 15 and October 15.

1.3.1. Construction Activities

Eureka Hill Road Bridge consists of a reinforced concrete box girder superstructure supported by cast in steel shell piles and seat type abutments. The bridge has four spans and is approximately 320 feet long by 22. 7 feet wide. Bridge foundation structures from west to east are as follows: abutment 1, pier 2, pier 3, pier 4, and abutment 5. Piers 2, 3, and 4 are approximately 8 feet long and 3 feet wide. During summer flows, the Garcia River is approximately 40 feet wide and passes around pier 2 on the western side of the bridge. Piers 2 and 3 are within the channel of the Garcia River; and pier 4 and abutments 1 and 5 are several feet outside the ordinary high water mark (OHWM).

Retrofit of Eureka Hill Road Bridge will involve the following activities: (1) construction of a temporary work pad in the channel beneath the existing bridge with temporary culverts to maintain flow and fish passage through the site; (2) addition of steel columns casings (sheet metal coverings) to piers 2, 3, and 4; (3) installation of cast in drill hole piles (CIDH) at abutments 1 and 5 and piers 2, 3, and 4; and (4) constructing below grade 'concrete top mats' at piers 2, 3, and 4 to tie piles to existing pier footings.

Construction within the dewatered low flow channel will only take place at pier 2. At piers 2, 3, and 4 top mats will be installed approximately eight feet below grade around existing pier footings. Steel column casings will increase pier column diameters by a nominal amount (less than a few inches) and top mats will increase footing lengths by approximately 10 feet (5 feet upstream and 5 feet downstream), although footings are well below grade. Vegetation removal will be limited to riparian and understory growth in the immediate vicinity of the bridge, and no trees greater than six inches diameter at breast height (dbh) will be removed. Minimal grading will occur because there is existing access to both sides of the channel immediately downstream of the bridge through the previous road alignment. Any debris associated with retrofit of the bridge will be contained on the work pad, removed following construction activities, and disposed of off-site.

Redwood logs (*Sequoia sempervirens*) will be incorporated into the dewatered channel perpendicular to the banks and immediately downstream of the bridge. Logs will be greater than 24 inches dbh and sourced from a grove immediately northeast of the action area or an alternate site within the Garcia River watershed. If possible, logs will include root wads and span the low flow channel downstream of the bridge. Following construction, temporarily disturbed riparian areas will be restored to natural grade (if necessary) and revegetated with native plants. Upon completion of the Project, the temporary work pad and dewatering features will be removed and the river will be allowed to reform the channel through any fish rock left in place along natural contours. In-channel Project activities are expected to require one season (June 15 through October 15) to complete.

1.3.2. Workpad Installation and Stream Diversion and Dewatering Plan

The Garcia River channel will be accessed through the previous road alignment on the north side of the bridge. Dewatering for construction of the temporary work pad will occur over approximately 90 linear feet of the Garcia River. The pad will extend approximately 60 feet upstream and 30 feet downstream of existing bridge centerline. Prior to dewatering activities, fish will be captured and relocated, and excluded from the work area with block nets. Flows will be bypassed through the work area by funneling flows with clean plastic sheeting and gravel through temporary culverts; temporary culverts will remain in place during in-channel construction to maintain fish passage and bypass flows through the work area. Following fish relocation and dewatering, the dewatered area and culverts will be covered with gravels that are clean, round, and suitably sized for salmonid spawning ("fish rock").

As described in the 2021 BO, temporary culverts would be installed to maintain flow and fish passage through the site as well as providing construction access to piers. The water diversion would occur approximately 20 feet upstream and 50 feet downstream of the existing bridge for a length of approximately 90 linear feet of the Garcia River.

Once the water diversion is in place, aquatic life capture and relocation efforts will occur in the water displacement area; some potential dewatering may be needed to assist in the effort. Once the work area is free of aquatic life, the temporary gravel pad would be constructed by placing cleaned washed gravel in the stream zone utilizing a loader and an excavator. Approximately 800 cubic yards of material would be utilized to build the gravel pad. Once complete, the gravel pads would allow equipment to access Pier 2 directly from the riverbanks for installation of the sheet piling around the pier. Excavation of the pier column in preparation of steel column casings installation would then occur. Incidental groundwater would be pumped out and stored in nearby Baker Tanks until casing installation is complete.

No changes to the Garcia River water diversion or temporary gravel pad are proposed in the revised 2023 water diversion and dewatering plan. The dewatering approach has been modified as described below:

> Following water diversion of the work area, aquatic life capture and relocation efforts, and installation of the gravel pad, sheet piling would be installed around each pier column footing extending below each footing. Sheet piling would be installed using vibratory methods. The project biologist would be on-site during sheet pile driving activities. If behavioral observations determine that fish are reacting adversely to the pile driving, work would be stopped until a block net is swept upstream to provide a greater distance between the pile driving activities. Once vibratory pile driving is complete, the block nets would be removed and fish passage would resume through the diversion.
>
> Following sheet pile installation, excavation within the sheet piling would be performed to the bottom of existing footing. An approximately 2.5-foot-thick seal course concrete would be placed via tremie between the sheet piling and existing footing and allowed to cure for 48 hours. Submersible pumps would be used to pump the water out and into nearby Baker Tanks. After initial dewatering, any nuisance water would also be pumped to Baker Tanks. All water would be tested per the contract documents and be discharged into the sediment basin located downstream on the east side of the river. The column casings would then be installed, welded, and grouted in place.
>
> Following completion of the column casing installation, the seal course concrete would remain in place, the existing footings would be backfilled with native materials, and the sheet piling would be removed. The gravel material placed for the temporary pad would be removed with an excavator and off-hauled from the site. Finally, the diversion headwalls and pipes would be removed to restore natural flow.

1.3.3. California Endangered Species Act Conformance

A Section 2080.1 consistency determination for CCC coho salmon from the California Department of Fish and Wildlife (CDFW) will be requested for this project. In order for CDFW to issue a consistency determination, Caltrans shall provide funding security for mitigation requirements, in compliance with the Master Funding Agreement entered into by the California Department of Fish and Wildlife and Caltrans on September 3, 2021, to ensure that it has adequate funding to complete the mitigation measures. This project is funded under Expenditure Authorization BRLRT-5910(041) and (114) by the Federal Highway Administration (FHWA) Highway Bridge Program as administered by Caltrans. A total of $1,368,750 has been programmed for the construction of this bridge replacement project as described herein. The project funding appropriation will include funds needed for all associated fish habitat enhancement structures, BMPs, and avoidance/minimization measures, as described, during construction, as well as mitigation monitoring and maintenance following project completion, which is estimated to be $400,000. The specific financial commitments needed to secure the various project construction permits will be defined/resolved with each agency during the final design/permit acquisition stage of the project.

1.3.4. Avoidance and Minimization Measures

Section 2.4 of the biological assessment (Caltrans 2021) is incorporated here by reference and describes several construction methods and best management practices 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 windows.
- Fish capture and relocation.
- Erosion and Sediment Control.
- Prevention of Accidental Spills and Pollution.
- Air Quality and Dust Control.
- Vegetation Replacement in Riparian Areas.

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

2. Endangered Species Act: Biological Opinion And Incidental Take Statement

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species or to 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 reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion also relies on the regulatory 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 Central California Coast coho salmon, Northern California steelhead, and California Coast Chinook salmon use the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the 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 ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision 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 critical habitat using an exposure–response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species; or (2) directly or

indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

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

2.1.1. Use of Best Available Scientific and Commercial Information

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 at the Eureka Hill Bridge Seismic Retrofit Project on the listed species in question, their anticipated response to these actions, and the environmental effects of the actions as a whole was formulated from the aforementioned resources, and the following:

- NMFS Biological Assessment, Eureka Hill Bridge Seismic Retrofit Project. Caltrans. 2021.

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that is likely to 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" for the jeopardy analysis. 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.

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

Threatened Northern California (NC) steelhead DPS (*Oncorhynchus mykiss*)
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005);

Endangered Central California Coast (CCC) coho salmon ESU (*O. kisutch*)
Critical habitat designation (64 FR 24049; May 5, 1999);

California Coastal (CC) Chinook salmon ESU
Threatened (70 FR 37160; June 28, 2005)
Critical habitat designation (70 FR 52488; September 2, 2005).

2.2.1. General Life History of Listed Species

2.2.1.1 NC Steelhead

The NC steelhead (*Oncorhynchus mykiss*) DPS is a federally threatened species. NMFS listed the NC steelhead DPS on June 7, 2000 (65 FR 36074) and reaffirmed the listing status as threatened on February 5, 2006 (71 FR 834). This DPS includes all naturally spawned anadromous *Oncorhynchus mykiss* populations below natural and human-made impassable barriers in California coastal river basins from Redwood Creek (Humboldt County) southward to, but not including, the Russian River (71 FR 834). Two artificial propagation programs are considered part of the DPS: the Yager Creek Hatchery and the North Fork Gualala River Hatchery (Gualala River Steelhead Project) (71 FR 834).

Steelhead are the anadromous form of *O. mykiss*, spawning in freshwater and migrating to marine environments to grow and mature. They are further classified as winter or summer steelhead based on the timing of their spawning migration. Steelhead have a complex life history that requires successful transition between life stages across a range of freshwater and marine habitats (i.e., egg-to-fry emergence, juvenile rearing, smolt outmigration, ocean survival, and upstream migration and spawning). Steelhead exhibit a high degree of life history plasticity (Shapovalov and Taft 1954; Thrower et al. 2004; Satterthwaite et al. 2009). The occurrence and timing of these transitions are highly variable and generally driven by environmental conditions and resource availability (Satterthwaite et al. 2009; Sogard et al. 2012).

Steelhead are generally divided into two ecotypes based on timing and state of maturity when returning to freshwater: summer-run and winter-run. Summer-run steelhead return to natal streams in spring and early summer while they are still sexually immature and spend several months maturing before spawning in January and February. Winter-run steelhead enter natal streams as mature adults with well-developed gonads. They typically immigrate between December and April and spawn shortly after reaching spawning grounds (Shapovalov and Taft 1954; Moyle et al. 2008).

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

Upon emerging from redds, juvenile steelhead occupy edgewater habitats where flow velocity is lower and cover aids in predator avoidance. Rearing juveniles feed on a variety of aquatic and terrestrial invertebrates. As they grow, juveniles move into deeper pool and riffle habitats where they continue to feed on invertebrates and have been observed feeding on younger juveniles (Chapman and Bjornn 1969; Everest and Chapman 1972). Juveniles can spend up to four years rearing in freshwater before migrating to the ocean as smolts, although they typically only spend one to two years in natal streams (Shapovalov and Taft 1954; Busby et al. 1996). Successful rearing depends on stream temperatures, flow velocities, and habitat availability. Preferred water temperature ranges from 12 to 19°C and sustained temperatures above 25°C are generally considered lethal (Smith and Li 1983; Busby et al. 1996). In Central California streams, juvenile steelhead are able to survive peak daily stream temperatures above 25°C for short periods when food is abundant (Smith and Li 1983). Response to stream temperatures can vary depending on the conditions to which individuals are acclimated, however, consistent exposure to high stream temperatures results in slower growth due to elevated metabolic rates and lower survival rates overall (Hokanson et al. 1977; Busby et al. 1996).

Juveniles undergo behavioral, morphological, and physiological changes in preparation for ocean entry, collectively called smoltification. Juveniles begin smoltification in freshwater and the process continues throughout downstream migration with some smolts using estuaries for further acclimation to saltwater prior to ocean entry (Reiser and Bjornn 1979). Juveniles typically will not smolt until reaching a minimum size of 160 mm (Burgner et al. 1992). Smoltification is cued by increasing photoperiod. Stream temperatures influence the rate of smoltification, with warmer temperatures leading to more rapid transition. Downstream migration of smolts typically occurs from April to June when temperature and stream flows increase. Preferred temperature for smoltification and outmigration is between 10 and 17°C with temperatures below 15°C considered optimal (Hokinson et al. 1977; Wurtsbaugh and Davis 1977; Zedonis and Newcomb 1997; Myrick and Cech 2005). In coastal systems with seasonal lagoons, smolts may take advantage of higher growth potential in productive lagoon habitats before ocean entry (Osterback et al. 2018).

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

2.2.2. CCC Coho Salmon

NMFS listed the CCC coho salmon ESU as threatened on October 31, 1996 (61 FR 56138) and subsequently reclassified it as endangered on June 28, 2005 (70 FR 37160). This ESU includes naturally spawned coho salmon originating from rivers south of Punta Gorda, California, southward to and including Aptos Creek, as well as coho salmon originating from tributaries to San Francisco Bay. Three artificial propagation programs are considered part of the ESU: Don

Clausen Fish Hatchery Captive Broodstock Program, Scott Creek/King Fisher Flats Conservation Program, and Scott Creek Captive Broodstock Program. CDFW listed CCC coho salmon north of San Francisco Bay as endangered under CESA on March 30, 2005.

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

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.

Female coho salmon choose spawning areas usually near the head of a riffle, just below a pool, where water changes from a laminar to a turbulent flow and small to medium gravel substrate are present. The flow characteristics surrounding the redd usually ensure good aeration of eggs and embryos, and flushing of waste products. The water circulation in these areas also facilitates fry emergence from the gravel. 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.

Each female builds a series of redds, moving upstream as she does so, and deposits a few hundred eggs in each. Fecundity of female coho salmon is directly proportional to size; each adult female coho salmon may deposit from 1,000 to 7,600 eggs (Sandercock 1991). Briggs (1953) noted a dominant male accompanies a female during spawning, but one or more subordinate males may also engage in spawning. 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 female may guard a redd for up to two weeks (Briggs 1953).

The eggs generally hatch after four to eight weeks, depending on water temperature. Survival and development rates depend on temperature and dissolved oxygen levels within the redd. According to Baker and Reynolds (1986), under optimum conditions, mortality during this period can be as low as 10 percent; under adverse conditions of high scouring flows or heavy siltation, mortality may be close to 100 percent. 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 remains in the redd from two to seven weeks before emerging from the gravel (Shapovalov and Taft 1954). Upon emergence, fry seek out shallow water, usually along stream margins. As they grow, juvenile coho salmon often occupy habitat at the heads of pools, which generally provide an optimum mix of high food availability and good cover with low swimming cost (Nielsen 1992). Chapman and Bjornn (1969) determined that larger parr tend to occupy the head of pools, with smaller parr found further down the pools. 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 is slowed 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 interstices of 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, if conditions are favorable. Emigration timing is correlated with peak upwelling currents along the coast. Entry into the ocean at this time facilitates more growth and, therefore, greater marine survival (Holtby et al. 1990). At this point, the smolts are about four to five inches in length. After entering the ocean, the immature salmon initially remain in nearshore waters close to their parent stream. They 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.

2.2.3. CC Chinook Salmon

Chinook salmon 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 ascend freshwater streams to spawn. Eggs (laid in gravel nests called redds), alevins (gravel dwelling hatchlings), fry Juveniles newly emerged from stream gravels), and young juveniles all rear in freshwater until they become large enough to migrate to the ocean to finish rearing and maturing into adults. Chinook salmon are the largest member of the Oncorhynchus genus, with adults weighing more than 120 pounds having been reported from North American waters (Scott and Crossman 1973; Page and Burr 1991). Chinook salmon exhibit two main life history strategies: ocean-type fish and river-type fish (Healey 1991; Myers et al. 1998). Ocean-type fish typically are fall or winter-run fish that enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of rivers, and spawn within a few weeks of freshwater entry. Their offspring emigrate to estuarine or marine environments shortly after emergence from the redd (Healey 1991). River-type fish are typically spring or summer-run fish that have a protracted adult freshwater residency, sometimes spawning several months after entering freshwater. Progeny of river-type fish frequently spend one or more years in freshwater before emigrating. The low flows, high river temperatures, and sand bars that develop in smaller coastal rivers in California during the summer months favor an ocean-type life history (Kostow 1995). Therefore, Chinook salmon of the Russian River and its tributaries are of the ocean-type. With this life history, smolts typically out-migrate as sub-yearlings during April through July (Myers et al. 1998). The ocean-type Chinook salmon in California tend to use estuaries and coastal areas for rearing more extensively than river-type Chinook salmon. The brackish water areas in estuaries provide rich sources of important lipids and moderate the physiological stress that occurs during parr-smolt transitions. Given the proposed construction period - June 15 through October 15 - and the life history of Chinook salmon, only juveniles are likely to be present in the action area during construction. The remainder of this section is dedicated to that life stage.

Fry emergence begins in December and continues into mid-April (Leidy and Leidy 1984). Emergence can be hindered if the interstitial spaces in the redd are not large enough to permit passage of the fry. In laboratory studies, Bjornn and Reiser (1991) observed that Chinook salmon and steelhead fry had difficulty emerging from gravel when fine sediments (6.4 millimeter (mm) or less) exceeded 30-40 percent by volume. After emergence, Chinook salmon fry seek out areas behind fallen trees, back eddies, undercut banks and other areas of bank cover (Everest and Chapman 1972). As they grow larger, their habitat preferences change. Juveniles move away from stream margins and begin to use deeper water areas with slightly faster water velocities, but continue to use available cover to minimize the risk of predation and reduce energy expenditure. Fish size appears to be positively correlated with water velocity and depth (Chapman and Bjornn 1969, Everest and Chapman 1972). Optimal temperatures for both Chinook salmon fry and fingerlings range from 12-14°C, with maximum growth rates at 12.8°C (Boles 1988). Chinook salmon feed on small terrestrial and aquatic insects and aquatic crustaceans. Cover, in the form of rocks, submerged aquatic vegetation, logs, riparian vegetation, and undercut banks provide food, shade, and protect juveniles from predation.

2.2.4. Critical Habitats

In designating critical habitat, NMFS considers, among other things, the following requirements of the species: 1) space for individual and population growth, and for normal behavior; 2) food, water, air, light, minerals, or other nutritional or physiological requirements; 3) cover or shelter; 4) sites for breeding, reproduction, or rearing offspring; and, generally; and 5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on physical and biological features, or PBFs, and/or essential habitat types within the designated area that are essential to conserving the species and that may require special management considerations or protection.

PBFs for NC steelhead and CCC coho salmon critical habitat, and their associated essential features within freshwater include:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;
2. Freshwater rearing sites with:
    a. water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
    b. water quality and forage supporting juvenile development; and
    c. natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks;
3. freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

Generally, for NC steelhead and 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 critical habitat include adequate: 1) substrate, 2) water quality, 3) water quantity, 4) water temperature, 5) water velocity, 6) cover/shelter, 7) food, 8) riparian vegetation, 9) space, and 10) safe passage conditions (64 FR 24029).

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

2.2.5. Global Climate Change

Global climate change presents an additional potential threat to salmonids and their critical habitats. Impacts from global climate change are already occurring in California. For example, average annual air temperatures, heat extremes, and sea level have all increased in California over the last century (Kadir et al. 2013). Snow melt from the Sierra Nevada Mountains has declined (Kadir et al. 2013). However, total annual precipitation amounts have shown no discernable change (Kadir et al. 2013). Listed salmonids may have already experienced some detrimental impacts from climate change. NMFS believes the impacts on listed salmonids to date are likely fairly minor because natural, and local, climate factors likely still drive most of the climatic conditions steelhead experience, and many of these factors have much less influence on steelhead abundance and distribution than human disturbance across the landscape.

The threat to listed salmonids from global climate change will increase in the future. Modeling of climate change impacts in California suggests that average summer air temperatures are expected to continue to increase (Lindley et al. 2007; Moser et al. 2012). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe et al. 2004, Moser et al. 2012; Kadir et al. 2013). Total precipitation in California may decline; critically dry years may increase (Lindley et al. 2007; Schneider 2007; Moser et al. 2012). Wildfires are expected to increase in frequency and magnitude (Westerling et al. 2011, Moser et al. 2012).

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 (OEHHA 2018). Estimates show that snowmelt contribution to runoff in the Sacramento/San Joaquin Delta may decrease by about 20 percent per decade over the next century (Cloern et al. 2011). Many of these changes are likely to further degrade listed salmonid habitat by, for example, reducing stream flows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to salmonids. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia et al. 2002, Ruggiero et al. 2010). In marine environments, ecosystems and habitats important to juvenile and adult salmonids are likely to experience changes in temperatures, circulation, water chemistry, and food supplies (Brewer and Barry 2008; Feely 2004; Osgood 2008; Turley 2008; Abdul-Aziz et al. 2011; Doney et al. 2012). The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007; Santer et al. 2011).

2.3. Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this consultation, the action area consists of temporarily and permanently disturbed riparian and instream habitat associated with bridge retrofit activities. The temporary work pad will cover approximately 90 linear feet of channel below the bridge. Temporary increases in turbidity associated with construction activities could extend an additional 250 feet downstream of the pad. Salmonids will likely be relocated directly downstream of the dewatered area. Therefore, the action area encompasses approximately 340 linear feet of the Garcia River and the associated riparian habitat, and extends approximately 280 feet downstream and 60 feet upstream of the existing bridge centerline.

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).

The Garcia River originates in the Coast Range south of Boonville and flows approximately 44 miles west to meet the Pacific Ocean near Point Arena. The Project's action area is within the coastal fog belt, with winter rain and summer fog providing a consistently moist and cool environment. The action area is located in southwestern Mendocino County on the Garcia River approximately nine miles upstream of the Pacific Ocean. The Garcia River, including the action area, maintains flow and suitable temperatures for salmonids during summer months. With regard to the larger steelhead DPS, coho salmon ESU, and Chinook salmon ESU, the habitat within the action area represents a very small portion of the available migratory, spawning and rearing habitat. In general, summer rearing habitat within the action area is of good quality (discussed in further detail below). Available salmonid spawning and rearing habitat exists in the action area, and steelhead and salmon migrating through the action area can access additional spawning and rearing habitat upstream.

2.4.1. Status of Listed Species and Critical habitat in the Action Area

The North Coast Regional Water Quality Control Board (RWQCB) and The Nature Conservancy (TNC) performed annual snorkel surveys in the Garcia River Watershed between 2008 and 2012. In September 2012, RWQCB surveyed a total of 14 reaches and observed juvenile steelhead in 13 reaches, juvenile coho salmon in 4 reaches, and no Chinook salmon (RWQCB 2012). Each survey reach was comprised of ten 40 to 60 meter transects, and a maximum of 25 steelhead and coho salmon were counted per age class per transect. In 2012, survey reaches were located approximately one mile upstream and one mile downstream of the action area, and RWQCB observed the highest approximate numbers of steelhead and coho salmon in these two reaches (RWQCB 2012). In the survey reach upstream of the Project site, RWQCB observed over 25 steelhead in 8 out of 10 transects and 1 to 15 coho salmon in 3 out of 10 transects (RWQCB 2012). In the survey reach downstream of the Project site, RWQCB observed over 25 steelhead in 9 out of 10 transects and over 25 coho salmon in 3 out of 10 transects (RWQCB 2012).

Past juvenile salmonid density surveys in the Garcia River Watershed estimated the highest juvenile steelhead density in the North Fork Garcia River (2.19 fish per square meter) and the highest juvenile coho salmon density in the South Fork Garcia River (0.52 fish per square meter) (RWQCB 2000). Reports of Chinook salmon in the Garcia River are uncommon, and the lack of observations is probably a result of the small Chinook salmon population and timing of surveys (summer and fall). Juvenile Chinook salmon ocean migration typically occurs during spring months before surveys are conducted. Although habitat conditions in portions of the Garcia River are adequate for adult Chinook salmon spawning and juvenile rearing, the lack of juvenile Chinook salmon observations suggest Chinook salmon numbers in the action area are likely low during summer and fall months. The action area was not included in the surveys described above although habitat conditions in the action area are similar to surveyed reaches in the main stem Garcia River. Relative to more developed watersheds, juvenile steelhead and coho numbers in the action area are likely to be high and moderate respectively during summer and fall months, while Chinook salmon numbers are likely to be low or absent.

The Garcia River, including the action area, is designated critical habitat for NC steelhead, CCC coho salmon, and CC Chinook. The action area contains spawning, rearing and migration habitat PCE's and/or essential features.

Within the action area the channel passes around pier 2 and is approximately 40 feet wide and predominated by run habitat up to approximately 3 feet in depth during summer flows. Gravel and cobble substrates are present throughout the action area and a wide elevated gravel bar covers the east side of the channel beneath the bridge where piers 3 and 4 are positioned. The primary riparian vegetation in the action area is red alder (Alnus rubra) and depressions, undercut banks, and small woody debris (less than six-inch dbh alder logs) are present in the low flow channel. Substrates are primarily gravel and cobble (course grain size), scour and bank erosion has not been observed, and the riparian canopy is intact. Some upland areas within the previous road alignment to the north of the bridge are vegetated with invasive plants or lack cover. Based on substrate and habitat features, the action area contains ample salmonid spawning and rearing habitat.

2.4.2. Factors Affecting Species and Habitat within the Action Area

Although habitat in the action area is in better condition than stream habitat in many urbanized watersheds, water quality in the Garcia River Watershed is listed as impaired by the North Coast Regional Water Quality Control Board due to sedimentation caused, in part, by historic land use practices such as timber harvest and cattle grazing (RWQCB 2000). Upland areas near the action area is mostly undeveloped with a redwood grove on the northeastern side of the bridge and a small rural residential development on the southwestern side of the bridge. Furthermore, the Eureka Hill Road Bridge appears to appropriately span the channel during most high flow conditions and allow for potential channel migration. In addition to potential water quality issues, listed salmonids in the action area are likely adversely affected by poaching of adult salmonids during the winter spawning season due to spawning habitat in the action area and public access at the bridge (Scully 2013).

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 (see 50 CFR 402.02). 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 the factors set forth in 50 CFR 402.17(a) and (b).

Construction activities associated with this Project are expected to affect NC steelhead, CCC coho salmon, and Chinook salmon through fish relocation, dewatering of stream reaches, noise effects from sheet-pile driving, and temporary increased sediment mobilization. Construction is scheduled to occur between June 15 and October 15. Juvenile steelhead, coho salmon, and Chinook salmon are expected to be in the action area during this period. Effects to NC steelhead, CCC coho salmon, and CC Chinook salmon critical habitat in the action area include the temporary loss of instream and riparian habitat in and around the temporary work pad and the incorporation of large woody debris into the low flow channel. The potential effects of these activities are presented in detail below.

2.5.1. Fish Relocation Activities

Fish relocation activities will occur during the summer or early fall low-flow period, after emigrating smolts have left and before adults have immigrated to the proposed action area. Juvenile steelhead and coho salmon will make up the bulk of captured salmonids; as explained above, few juvenile Chinook salmon are expected within the action area given the time of year construction is scheduled. Maximum juvenile salmonid density estimates for tributaries to the Garcia River were reported in RWQCB (2000). The proposed dewatered area (334.5 square meters) was multiplied by these densities (2.19 steelhead per square meter and 0.52 coho salmon per square meter) to generate a conceptual number of juvenile salmonids that could be relocated during dewatering (733 steelhead and 174 coho salmon). Densities are expected to be higher in these tributaries than the Garcia River due to more efficient habitat utilization by potentially smaller juvenile salmonids. Therefore, conceptual fish numbers were reduced by approximately 40 percent to better represent habitat conditions in the action area. Based on these calculations, NMFS conservatively estimates no more than 400 steelhead, 100 coho salmon, and 5 Chinook salmon individuals will be encountered within the dewatered area.

There is always the potential for injury or mortality when relocating juvenile salmonids. 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. Data on fish relocation efforts since 2004 shows most mortality rates are below three percent for steelhead (Collins 2004; CDFG 2005, 2006, 2007, 2008, 2009, 2010). Based on information from other relocation efforts, NMFS estimates injury and mortalities will be less than three percent of those steelhead, coho salmon, and Chinook salmon that are relocated (i.e., no more than 12 steelhead, 3 coho salmon, and 1 Chinook salmon). Fish that avoid capture during relocation may be exposed to risks described in the following section on dewatering.

Relocated fish may also have to compete with other fish, causing increased competition for available resources such as food and habitat. To reduce the potential for competition, fish relocation sites will be selected by the approved biologist to ensure the sites have adequate habitat to allow for survival of transported fish and fish already present. Nonetheless, crowding could occur which would likely result in increased inter- and intraspecific competition at those sites. 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). Relocation sites will be selected to ensure they have similar water temperatures as the capture sites, and adequate habitat to allow for survival of transported fish and fish already present. However, some of the fish released at the relocation sites may choose not to remain in these areas and move either upstream or downstream to areas that have more vacant habitat and a lower density of fish. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. In some instances, relocated fish may endure some short-term stress from crowding at the relocation sites. Such stress is not likely to be sufficient to reduce their individual fitness or performance. NMFS cannot accurately estimate the number of fish affected by competition or crowding. High quality aquatic habitat is present upstream and downstream of the Eureka Hill Road Bridge, however, so the fitness of steelhead, coho salmon, and Chinook salmon at the relocation sites is unlikely to be adversely affected.

2.5.2. Stream Diversion and Dewatering

Stream flow dewatering and worksite isolation could harm individual rearing juvenile salmonids by concentrating or stranding them in residual wetted areas (Cushman 1985). Rearing salmonids could be killed or injured if crushed during dewatering activities, though direct mortality is expected to be minimal due to relocation efforts prior to installation of the diversion. Fish that avoid capture in the dewatered area will likely die during dewatering activities from desiccation or thermal stress. Because of relocation efforts, NMFS expects that the total number of juvenile salmonids that will be killed as a result of stranding during dewatering activities will be less than those killed during relocation (i.e., less than one percent of the salmonids present at the Project site, or 4 juvenile steelhead, 1 juvenile coho salmon, and 1 Chinook salmon).

Stream flow and fish passage will be maintained through culverts beneath the temporary work pad. Dewatering activities are expected to temporarily alter and reduce the volume of aquatic habitat. Furthermore, juvenile fish will be prevented from accessing the construction area during dewatering activities. NMFS anticipates only a small section of stream channel will be dewatered for in-channel construction activities (approximately 90 linear feet), a very minor portion of habitat currently utilized by steelhead, coho salmon, and Chinook salmon within the Garcia River. Furthermore, instream habitat will only be dewatered during the summer rearing season (i.e., June 15 to October 15).

Dewatering operations at the work site may affect benthic (bottom dwelling) aquatic macroinvertebrates, an important food source for steelhead. Benthic aquatic macroinvertebrates at the project site may be killed or their abundance reduced when the creek habitat is dewatered (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from stream flow diversion and dewatering activities will be temporary because construction activities will be short lived, and the dewatered reach will not exceed 90 linear feet within the Garcia River. Rapid recolonization (typically one to two months) of disturbed areas by macroinvertebrates is expected following rewatering (Cushman 1985, Thomas 1986, Harvey 1986). Within the action area, the effect of macroinvertebrate loss on juvenile steelhead is likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered area since stream flow will be bypassed around the work site. Based on the foregoing, juvenile steelhead are not anticipated to be exposed to a reduction in food sources at the work site from the minor and temporary reduction in aquatic macroinvertebrates as a result of dewatering activities. Because habitat in and around the action area is adequate to support salmonids, NMFS expects steelhead will be able to find food both upstream and downstream of the action area as needed during dewatering activities.

2.5.3. Noise Impacts

To complete the sheet pile installations, the Project proposes to use a vibratory hammer. Vibratory hammers use counter-rotating eccentric weights to transmit vertical vibrations into the pile, causing the sediment surrounding the pile to liquefy and allow the pile to penetrate the substrate. The vibratory hammer produces sound energy that is spread out over time and is generally 10 to 20 dB lower than impact pile driving (Buehler et al. 2015). Based on the results of hydroacoustic monitoring of vibratory hammer pile installations (Buehler et al. 2015), the sound levels generated by vibratory hammer use will be considerably below the injury and mortality thresholds for both single strike and cumulative SEL. Additionally, pile driving activities by vibratory hammer will occur within the dewatered creek channel, further reducing noise impacts. Therefore, adverse effects to listed salmonids from sheep pile driving are anticipated to be insignificant.

2.5.4. Sedimentation and Turbidity

Disturbing the streambed or bank during access work pad construction and removal may temporarily increase turbidity levels within and downstream of the Project site. NMFS anticipates that short-term increases in turbidity may occur during work pad removal. Likewise, streambank grading and riparian planting may temporarily increase turbidity levels within and downstream of the Project site.

Sediment may affect salmonids in several ways. High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelly 1961; Bjornn et al. 1977; Berg and Northcote 1985), reduce growth rates (Crouse et al. 1981), and increase plasma cortisol levels (Servizi and Martens 1992). High turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and can also cause fish mortality (Sigler et al. 1984; Berg and Northcote 1985; Gregory and Northcote 1993; Velagic 1995; Waters 1995). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation, decreasing chances of survival. With regard to physical habitat condition, increased sediment deposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles (Alexander and Hansen 1986).

Turbidity levels resulting from the Project are expected to be less intense than the conditions encountered in the above-mentioned studies. Project activities are unlikely to elevate instream sediment to significant levels due to the multiple erosion minimization measures proposed (e.g., utilizing silt fences and straw bales, isolating soil stockpiles away from the channel, etc.).
As noted above, a small window of elevated turbidity may arise in the Garcia River during work pad construction and removal. NMFS expects the duration and intensity, as well as the spatial extent, of the turbid conditions to be very limited. Based on NMFS' experience with other similar projects and the limited disturbance and the low flows expected, turbidity is unlikely to occur more than 250 feet downstream of the area to be dewatered. Therefore, the response, if any, of salmonids exposed to these short time periods of small increases in turbidity is not expected to result in adverse effects to NC steelhead, CCC coho salmon, or CC Chinook salmon.

2.5.5. Hazardous Materials and Contaminants.

Operating equipment in and near streams has the potential to introduce hazardous materials and contaminants into streams. 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 decomposes, or by introducing toxic chemicals such as hydrocarbons or metals into aquatic habitat. Oil and similar substances from construction equipment can contain a wide variety of polynuclear hydrocarbons (PAHs) and metals. PAHs can alter salmonid egg hatching rates and reduce egg survival as well as harm the benthic organisms that are a salmonid food source (Eisler 2000). Disturbance of streambeds by heavy equipment or construction activities can also cause the resuspension and mobilization of contaminated stream sediment with absorbed metals.

The equipment needed to complete the project has the potential to release debris, hydrocarbons, concrete, and similar contaminants into surface waters at both work sites. These effects have the potential to harm or injure exposed fish and temporarily degrade habitat. However, AMMs proposed will substantially reduce or eliminate the potential for construction materials and debris to enter waterways. Limiting the work window to the dry season from June 15 to October 15 will limit hazardous material exposure to juvenile salmonids, and eliminate potential for containments to adversely affect the most sensitive life stages (i.e., eggs, alevin, and fry). Equipment will be checked daily to ensure proper operation and avoid any leaks or spills. Proper storage, treatment, and disposal of construction materials and discharge management is expected to substantially reduce or eliminate contaminants entering both waterways via runoff. Due to these measures, conveyance of toxic materials into active waters at the work site both during, and after, project construction is not expected to occur, and potential for the project to degrade water quality and adversely affect salmonids is improbable.

2.5.6. Effects to Critical Habitat

The Garcia River is designated critical habitat for NC steelhead, CCC coho salmon, and CC Chinook. PCEs of designated critical habitat for NC steelhead and CC Chinook salmon and essential habitat types of critical habitat for CCC coho salmon in the action area include sites for migration, spawning and rearing. The potential effects of this Project to designated critical habitat associated with construction include temporary loss of rearing sites during dewatering, minor disturbance of the bed and banks, and potential increase of habitat complexity and refugia associated with large woody debris installation. The temporary loss of channel and associated streambanks (beneath the temporary work pad) for a four-month period during construction is not expected to permanently adversely affect essential physical or biological features associated with NC steelhead, CCC coho salmon, or CC Chinook salmon critical habitat. As discussed above, fish within the dewatered area will be relocated and sufficient habitat exists adjacent to the work site to support these individuals, which therefore will not experience the adversely affected habitat. When the project is complete, the workpad will be removed and critical habitat will return to its pre-project condition (along with any remaining "fish rock" which may add to spawning gravels in the action area).

Bridge retrofit is not anticipated to result in a significant change in habitat space as the above grade bridge footprint will remain unchanged and disturbed areas will be restored to natural grade. Large redwood logs added to the channel downstream of the bridge will add cover, habitat complexity, and potentially small scour pool habitat to the action area as river flows interact with these features. Native plantings will be incorporated into exposed streambanks and, in some cases, areas that currently lack significant vegetative cover or are vegetated by invasive plants (i.e., existing staging areas and road alignment north of the bridge). Incorporation large wood and native plantings could improve conditions in the action area by increasing instream and riparian cover and habitat complexity.

2.6. Cumulative Effects

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

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

2.7. Integration and Synthesis

The Integration and Synthesis section is the final step in assessing the risk that the proposed action poses to species and critical habitat. 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.

NC steelhead, CCC coho salmon, and CC Chinook salmon occur within the Garcia River, and are currently at very low abundance levels throughout their ranges as compared to historical population estimates. Human induced factors affecting steelhead, coho salmon, and Chinook salmon critical habitat, such as logging, agricultural and mining activities, urbanization, stream channelization, dams, and wetland loss, have impaired migration, spawning and rearing habitat throughout their historic ranges. This Project will likely result in direct impacts to NC steelhead, CCC coho salmon, and CC Chinook salmon. Juvenile salmonid movement into and out of the action area will be temporarily impacted while the construction site is isolated from the Garcia River channel, and the capture and relocation of fish during dewatering may result in the harassment or death of a small number of captured fish. However, the impact to the steelhead, Chinook salmon, and coho salmon population within the Garcia River arising from these effects will likely be low. NMFS expects that migrating adult and smolting steelhead, coho salmon, and Chinook salmon will have passed the action area before construction occurs. Combined mortality rates of juvenile salmonids during dewatering and relocation activities are likely no more than four percent of those present in the construction area (three percent mortality associated with relocation activities and less than one percent mortality associated with dewatering or desiccation), so the risk of mortality to any encountered salmonid is low. Impacts from turbidity related to construction activities are temporary and not anticipated to adversely affect salmonids.

Any salmonids present in the action area during the construction window likely make up a small proportion of the Garcia River sub-population, or NC steelhead DPS, CCC coho salmon ESU, or CC Chinook salmon ESU. NMFS believes it is unlikely that the small potential loss of juvenile fish resulting from the Project will impact future adult returns, due to the relatively large number of juveniles produced by each spawning pair in the watershed. Thus, the Project is unlikely to appreciably reduce the likelihood of survival and recovery of NC steelhead, CCC coho salmon, or CC Chinook salmon.

As described above, impacts to critical habitat are minimal. The majority of Project impacts will occur during summer months when water levels are low and the extent of dewatering, streambed disturbance, and turbidity will be minimized. A small amount riverine and riparian habitat will be altered by equipment accessing the channel and the installation of new bridge foundations below grade. This loss is not expected to impact the value of critical habitat in the action area because the size of habitat alteration is very small and disturbed areas around the existing bridge will be restored following construction. Furthermore, the addition of redwood logs to the channel downstream of the bridge is expected to improve habitat complexity in the action area. Therefore, NMFS expects the short-term loss of a small amount of stream bed and bank will not appreciably diminish the long-term value of steelhead, coho salmon, and Chinook salmon critical habitat within the action area. Riparian planting and incorporation of large wood could result in a long-term improvement in riparian and instream cover and may increase resilience to climate change in the action area.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of CCC coho salmon, NC steelhead, CC Chinook salmon or destroy or adversely modify their designated critical habitat.

2.9. Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Harass" is further defined by interim guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." "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. The take exemption conferred by this incidental take statement is based upon the proposed action occurring as described in the Biological Opinion and in more detail in the Caltrans Biological Assessment and the Caltrans April 26, 2023 Biological Assessment Addendum describing the updated dewatering plan.

2.9.1. Amount or Extent of Take

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

> As mentioned above, one juvenile CCC steelhead was captured during the discontinued effort in 2022. The number of ESA-listed salmonids that may be incidentally taken during Project activities is expected to be small. NMFS conservatively estimates that no more than 399 juvenile steelhead, 100 coho salmon, and 5 juvenile Chinook salmon may be present during dewatering activities. Any fish present during the construction window will need to be captured and relocated. Based on the low mortality rates for typical relocation efforts, NMFS anticipates no more than four percent of the juvenile salmonids present in the areas to be dewatered will be harmed or killed during capture, relocation and dewatering efforts. Incidental take will be exceeded if more than 399 juvenile steelhead, 100 coho salmon, or 5 juvenile Chinook salmon are captured for relocation, or if more than 16 steelhead, 4 coho salmon, or 1 Chinook salmon are harmed or killed.

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

NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of CCC coho, NC steelhead, and CC Chinook:

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

2. Prepare and submit a report to document effects of the dewatering and relocation.

2.9.4. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Federal action agency must comply (or must ensure that any applicant complies) with the following terms and conditions. Caltrans or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

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

    a) Caltrans or the contractor will retain qualified biologists with expertise in the area of anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. Caltrans or the contractor shall ensure that all fisheries biologists 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 qualified biologists and conducted according to the *NOAA Fisheries Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000*. See: https://media.fisheries.noaa.gov/dam-migration/electro2000.pdf

    b) The biologist will monitor the construction sites during placement and removal of cofferdams and channel diversions to ensure that any adverse effects to salmonids are minimized. The biologist will be on site during all dewatering events to capture, handle, and safely relocation salmonids to an appropriate location. The biologist will notify NMFS staff at 707-578-8553 or andrew.trent@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 three percent of the total steelhead collected, at which time NMFS will stipulate measures to reduce the take of salmonids.

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

d) If any steelhead or salmon are found dead or injured, the biological monitor will contact NMFS staff at 707-578-8553 or andrew.trent@noaa.gov. All salmonid mortalities will be retained until further direction is provided by the NMFS biologist (listed above).

i) Tissue samples are to be acquired from each mortality prior to freezing the carcass per the methods identified in the NMFS Southwest Fisheries Science Center Genetic Repository protocols: Either a 1 cm square clip from the operculum or tail fin, or alternately, complete scales (20-30) should be removed and placed on a piece of dry blotter/filter paper (e.g., Whatman brand). Fold blotter paper over for temporary storage. Samples must be airdried as soon as possible (don't wait more than 8 hours). When tissue/paper is dry to the touch, place into a clean envelope labeled with Sample ID Number. Seal envelope.

ii) Include the following information with each tissue sample using the Salmonid Genetic Tissue Repository form or alternative spreadsheet: Collection Date, Collection Location (County, River, Exact Location on River), Collector Name, Collector Affiliation/Phone, Sample ID Number, Species, Tissue Type, Condition, Fork Length (mm), Sex (M, F or Unk), Adipose Fin Clip (Y or N), Tag (Y or N), Notes/Comments.

iii) Send tissue samples to: NOAA Coastal California Genetic Repository, Southwest Fisheries Science Center, 110 McAllister Way, Santa Cruz, California 95060.

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

a) Caltrans must provide a written report to NMFS by January 15 of the year following construction. The report must be submitted to the parties and addresses described above in 1.c. The report must contain, at minimum, the following information:

b) Project Construction and Fish Relocation Report – the report must include the following contents:

i) **Turbidity Monitoring –** The report must include turbidity measurements at 250 feet downstream of the bridge prior to, during, and following construction and removal of the construction pad; a description of the equipment, and methods to measure turbidity must be included; and, if any fish are present within 250 feet of the construction pad, a brief narrative of any behavioral changes observed during turbidity monitoring should also be provided.

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

2.10. Conservation Recommendations

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

2.11. Reinitiation of Consultation

This concludes formal consultation for Reinitiation of Eureka Hill Seismic Retrofit Project.

Under 50 CFR 402.16(a): "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: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If 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 written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action."

3. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

3.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are Caltrans and the County of Mendocino. Individual copies of this opinion were provided to Caltrans. The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adhere to conventional standards for style.

3.2. Integrity

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

3.3. Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR part 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, if applicable*] contain more background on information sources and quality.

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

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

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32

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