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

August 3, 2020 **Refer to NMFS No:** WCRO-2020-00427

Adele Pommerenck
Senior Environmental Planner, Branch Chief
California Department of Transportation, District 3
Office of Environmental Management
703 B Street
Marysville, California 95901-5556

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act, Essential Fish Habitat Response for the Calpella 2 Bridge Replacement Project (01-0E090)

Dear Miss Pommerenck:

Thank you for the California Department of Transportation's (Caltrans)[1] letter on February 19, 2020, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Calpella 2 Bridge Replacement Project (01-0E090). This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016). Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

The enclosed biological opinion is based on our review of Caltrans's proposed project and describes NMFS' analysis of potential effects on threatened California Coastal (CC) Chinook salmon (*Oncorhynchus tshawytscha*), Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*), endangered CCC coho salmon (*Oncorhynchus kisutch*), and designated critical habitat for these species in accordance with section 7 of the ESA. In the enclosed biological opinion, NMFS concludes the project is not likely to jeopardize the continued existence of these species; nor is it likely to adversely modify critical habitat. However, NMFS anticipates that take of CC Chinook salmon and CCC steelhead may occur. An incidental take statement which applies to this project with non-discretionary terms and conditions is included with the enclosed opinion.

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

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

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Hannah Clark, Caltrans, hannah.clark@dot.ca.gov
Stephanie Frederickson, Caltrans, stephanie.frederickson@dot.ca.gov
Copy to ARN File # 151422WCR2020SR00046

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

Calpella 2 Bridge Replacement Project

NMFS Consultation Number: WCRO-2020-00427
Action Agency: California Department of Transportation (Caltrans)

Table 1. Affected Species and NMFS' Determinations

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Central California Coast Coho Salmon (*Oncorhynchus kisutch*)	Endangered	No	N/A	Yes	No
Central California Coast steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	No
California Coastal Chinook (*O. tshawytscha*)	Threatened	Yes	No	Yes	No

Table 2. Essential Fish Habitat and NMFS' Determinations

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	No

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: August 3, 2020

Table of Contents

1. INTRODUCTION

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

1.1 Background

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

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600. We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository. A complete record of this consultation is on file at the NMFS North-Central Coast Office in Santa Rosa, California.

1.2 Consultation History

On February 19, 2020 NMFS received an initiation package from Caltrans requesting formal consultation for their Project. Caltrans' request included a Biological Assessment; with one construction design plan sheet of unknown design level.

On March 12, 2020 NMFS requested more information via telephone and email. NMFS requested the following: description of proposed method for dewatering, description of proposed working and construction seasons, revegetation plan, a detailed description of access/staging areas, detailed description on the proposed debris containment system, language within the project description describing that additional construction design plans (30%, 60%, and final) would be submitted post-consultation, and a number of other smaller clarifications (please see project file for specific details).

Weekly meetings with NMFS (Elena Meza) and Caltrans (Hannah Clark) have occurred since March 2020 through July 2020 to provide technical assistance to aid Caltrans in gathering materials/information necessary to initiate consultation.

On April 21, 2020, Caltrans and NMFS met via telephone to discuss the materials Caltrans had previously submitted in February 2020 and to discuss what materials were still outstanding. During this meeting NMFS explained why the request for additional construction design plans were necessary and that consultation had not yet been initiated due to a number of outstanding items that had not been provided in response to our initial information request sent in March 2020. Additionally, NMFS also requested construction design plan sheets for the entire project at the appropriate design level (on this same date of April 21, 2020 Caltrans provided to NMFS draft 60% construction design plans).

A NMFS engineer reviewed the provided draft 60% construction design plans and provided comments to Caltrans on April 28, 2020 including questions regarding the excavation depths associated with removal of existing bridge piers, removal of existing rock slope protection (RSP) associated with existing structure, the depth of footers and piers for the proposed new bridge, and the spread footing design for proposed bridge and relation of these structural elements to the thalweg (see administrative file for full details).

On April 29, 2020 Caltrans and NMFS met to discuss the engineering comments. On this same date Caltrans submitted to NMFS a "draft final" hydraulic report and multiple "as built" design plan sheets for engineer review.

On May 29, 2020 NMFS provided comments and recommendations to Caltrans via email following review of the hydraulic report and "as built" design plan sheets. In this same email, NMFS notified Caltrans that their consultation had been initiated on April 29, 2020. On June 18, 2020 Caltrans and NMFS participated in a coordination call to discuss NMFS' May 29, 2020 recommendations. During this call Caltrans provided NMFS with multiple new cross sections illustrating the existing and proposed structures in relation to existing elevations.

NMFS reviewed these new materials and on June 30, 2020 provided revised recommendations for removal of the existing bridge (excavation depths and RSP removal), and construction of the proposed new bridge (see administrative file for full details). On July 14, 2020, Caltrans responded to NMFS' June 30, 2020 design recommendations by accepting the proposed recommendations resulting in modification to the proposed bridge design (for full details see administrative file).

NMFS utilized the information within Caltrans' biological assessment and shared information through numerous emails and phone calls that occurred between February 2020 and July 2020; however, in order to keep supplemental information in a single document, Caltrans prepared an addendum to the biological assessment. This signed addendum was submitted to NMFS on July 15, 2020. Within this addendum: 1) Caltrans modified their project description to include a schedule to submit additional construction plan designs to NMFS for review; 2) modified their project description regarding demolition of the existing structure, and construction of the proposed new bridge (see section 1.3); and 3) updated various sections within their biological assessment by adding new text/tables supplementing and/or replacing existing text (see Caltrans' Addendum to the biological assessment for more details).

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910).

Caltrans proposes to perform a complete bridge replacement of the Russian River Bridge (#10-182) and Redwood Valley Undercrossing (#10-183) onto one new alignment. The existing structures are located on State Route 20 (SR 20) in Mendocino County near Ukiah, California between post miles (PM) 33.3 to 34.4 where they cross the West Fork Russian River.[2] The purpose of the project is to improve the integrity of the bridge deck, avoid potential punching shear failures, and widen shoulders. The existing West Fork Russian River Bridge is 440 feet long, approximately 35 feet wide, spans the West Fork Russian River, and consists of simply-supported 4-span welded steel plate girders with a cast-in-place/reinforced concrete (CIP/RC) deck. The existing Redwood Valley Undercrossing is approximately 115 feet long and consists of a single span 4-tee beam with a CIP/RC bridge deck.

The proposed new bridge will be built to the south of the existing alignment with a 1600-foot radius curve. The new bridge will consist of a 7-span cast-in-place/prestressed concrete (CIP/PS) box girder structure, and will be approximately 870 feet long and 44 to 49 feet wide. The final structure will consist of two 12-foot lanes, two 8-foot shoulders, and one 12-foot east bound left turn lane.

The current project timeline is expected to start with tree removal beginning in fall 2021/winter 2022, with general bridge construction activities beginning in spring 2022. Caltrans expects bridge construction to take place over the course of three construction seasons (2022 - 2024). All work proposed to take place below the ordinary high water mark (OHWM) will be restricted to the in-water work window between June 15 and October 1, with the potential to extend this work window until October 15 if environmental conditions allow (*i.e.,* continuation of dry season low-flow conditions).[3] The Project will be constructed in two phases with the following actions proposed during each phase:

Phase 1:

- Vegetation Removal (2021/2022)
- Construct Staging Areas and Access Roads (2022)
- Excavation/Earth Moving Activities (2022)
- Set up Trestle and Falsework (2022)
- Construct New Bridge Structure (2022/2023)
- Construct Storm Water Drainage Facilities

Phase 2:

- Shift Traffic to New Alignment (2023)
- Demolish Existing Structures (2024)
- Remove Trestle and Falsework (2024)
- Regrade Channel (2023-2024)
- Replanting and Revegetation Activities (2023-2024)

[2] Latitude/longitude: 39.243378/-123.200142

[3] See Section 2.9.4 below for further details.

1.3.1 Vegetation Removal

Prior to beginning general construction, vegetation will need to be removed from the worksite to gain access to the existing and new bridge. Vegetation removal may include clearing and grubbing. Clearing involves removing and disposing of all unwanted surface material such as brush, grass, weeds, downed trees, and other material. Grubbing entails removing unwanted vegetative matter from beneath the ground surface, such as stumps, roots, buried logs, and other debris.

In addition to clearing and grubbing, trees will need to be removed. Caltrans anticipates the removal of approximately 54 riparian trees over 4 inch diameter-in-breast-height (DBH) (Tables 5, 6, and 7 of Caltrans 2020). These trees, will either be removed entirely, or will have their roots and stumps left intact. As described below in section 1.3.2 Construction Staging and Access Roads, a tree's proximity to proposed accesses roads will determine whether the entire tree and its roots are removed, or if only the tops will be removed (*i.e.,* stumps and roots remain in place). As described in their biological assessment (Caltrans 2020), Caltrans proposes a Conservation Measurement to salvage large woody debris, as feasible, resulting from project construction to be used by outside agencies or conservation groups to use in river restoration projects.[4]

1.3.2 Construction Staging and Access Roads

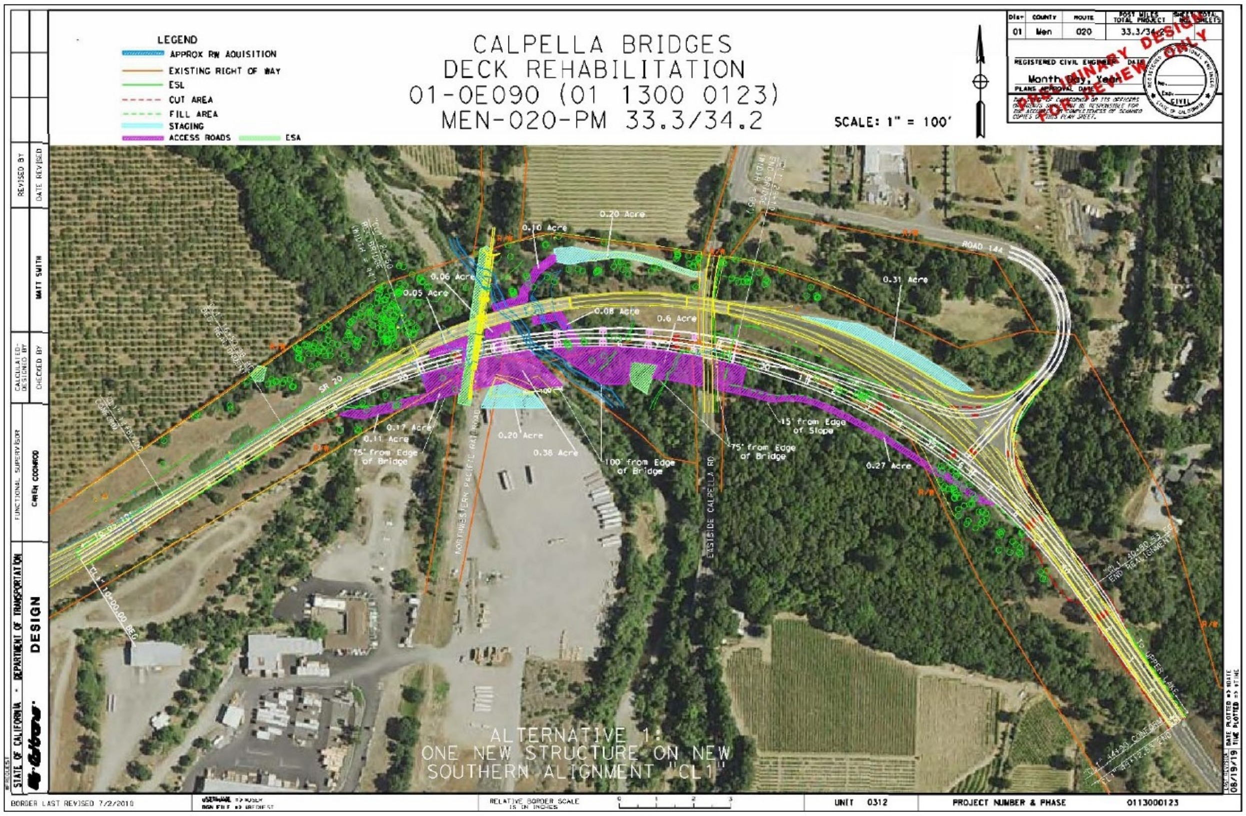
To successfully complete construction and demolition, staging areas are needed to store equipment. These areas include the turnouts east of the project site on the south and north sides of SR 20, the turnout between the US 101 northbound onramp and SR 20, the existing maintenance area north of the existing fill prism between the existing structures, and a portion of a commercial parcel to the south of the existing alignment of SR 20 (Figure 1).

A 50-foot-wide access road composed of placed rock will be required to facilitate construction of the pier foundations and falsework; an additional distance of approximately 50 feet adjacent to this access road will be cleared of vegetation to provide an open space to construct falsework and perform bridge construction. This road is located on both the east and west side of the Russian River (Figure 1). Additional roads (4) will be constructed to facilitate equipment access to the piers below the existing Russian River Bridge for demolition. One road will be constructed off the eastern access area downstream of the existing bridge, and the other would be constructed from a staging area on the upstream eastern side of the river, both roads will be approximately 20 feet wide and 175 feet long. Two additional roads will be constructed for access along the western side of the existing bridge; both will be approximately 20 feet wide and either 110 or 175 feet long (Figure 1). Vegetation, including trees that lie within the proposed pathway of the access road, will be removed entirely. Tress that are within 50 feet of access roads may have only their tops removed (*i.e.,* stumps and roots may remain in-ground). Removal of riparian trees

[4] Caltrans notes that storage of the debris would be the responsibility of the receiving agency or conservation group, due to the limited storage space within the action area.

and vegetation will result in approximately 1.15 acres of permanent and temporary reductions in vegetative cover.[5]

Figure 1: Construction Staging and Access Roads



1.3.3 Excavation and Earth Moving Activities

The Project would require both the cut of existing material, and the fill of new material to construct the new alignment. One fill prism will be located on the west end of the new West Fork Russian River Bridge and within the proposed action area. This prism will be approximately 200 feet long and a maximum of 15 feet taller than the original ground. The south slope of the prism would extend 55 feet horizontally and 25 feet vertically from the new southern edge of pavement before reaching original ground. The North Slope would extend approximately 10 feet horizontally and 10 feet vertically from the new northern edge of pavement before reaching original ground. Caltrans estimates a total of 6,000 cubic yards of sediment would be cut/filled within the action area to complete this work.

Portions of the existing creek bed and bridge structure, will need to be excavated within the action area to clear areas to construct abutments for the new bridge and/or to remove existing structural elements of the existing bridge (see sections 1.3.5 and 1.3.6 below for further details).

[5] This total includes vegetation removal described above under Section 1.3.1 Vegetation Removal.

1.3.4 Construct Trestles and Falsework

Trestles

Temporary work platforms (trestles) are required for construction of the proposed new bridge and removal of the existing bridge. Trestles will be constructed during the in-water work window between June 15 and October 1of 2022. Trestles will remain in place until the existing bridge is demolished, likely the end of the 2024 in-water work window. Thus, NMFS anticipates that piles used to support the temporary trestle will remain in the river for two winters and three construction seasons. The installation method for the trestles will be determined by the contractor during construction, but Caltrans assumes the supports of the trestles will either be driven or drilled piles. Driven piles would be installed using an impact hammer attached to a pile driving rig. If piles are drilled, they would most likely be installed utilizing the cast-in-drilled-hole (CIDH) method with a drill mounted to a rig. Large baker tanks would be needed to supply and circulate polymer drilling slurry, a crane would place structural elements, and a concrete truck would pump material to the drilled hole. Furthermore, portions of the creek bed would need to be dry prior to drilling, therefore a cofferdam would be required. The construction of cofferdams would require that sheet piles be vibrated into the river bottom in a rectangular shape, the cofferdam would then be dewatered. If needed, a seal course of concrete would be placed at the bottom of the coffer dam to prevent intrusion of water into the cofferdam.

The design and location of the trestle will be determined by the contractor; however, Caltrans has assumed the following: 1) due to the width of the West Fork Russian River, trestles are expected to be below OHWM and within the floodplain: 2) the trestles will be at least 50 feet clear of the new bridge location to allow for movement, swing, and reach needed for construction equipment; 3) each trestle will be 30 - 50 feet in width to allow mobility of equipment and lay-down areas for materials; 4) a trestle will be needed approximately every 20 feet (*i.e.,* 20 feet between each trestle bent); 5) each trestle bent will require 12 support piles; 6) support piles will be steel H-piles less than or equal to (≤) 24 inches in diameter; and) temporary fill resulting from trestle supports below OHWM will be ≤ 0.007 acres (based on 12 pile bents of ≤ 24 inch H-piles).

The width of the active channel, as measured by the OHWM, at the location of the proposed new bridge is approximately 60 feet. Caltrans anticipates that a maximum of 3 trestle bents would be needed to span this length, and would be supported on a maximum of 36 H-piles. Trestle bents would not only cross the active channel, but would also be required to cross portions of the Russian River floodplain within the action area. At the proposed bridge location, the floodplain area extends an additional 85 feet west of the right bank of the active channel requiring a maximum of 5 trestle bents supported on 60 H-piles. Caltrans assumes that it will take a maximum of 550 strikes to install one steel H-pile ≤ 24-inches and assumes that a maximum of 6 piles will be installed per day. Installation of 6 H-piles per day would result in a maximum of 3,300 strikes per day, and result in approximately 16 pile driving days; each day will require approximately 1.5 hours of pile driving (Table 3).

Falsework

As part of the bridge construction process, falsework would be required to support the new bridge during construction. Falsework will be constructed during the in-water work window between June 15 and October 1 of 2022. Falsework will remain in place until the existing bridge is demolished, likely the end of the 2024 in-water work window. Similar to the trestles, NMFS anticipates that falsework will remain in the river for two winters and three construction seasons. The installation method for the falsework will be determined by the contractor during construction, but Caltrans assumes the supports will either be driven or drilled piles. Driven piles would be installed using an impact hammer attached to a pile driving rig. If piles are drilled, they would most likely be installed utilizing the CIDH method (as described above for the trestles). Furthermore, portions of the creekbed would need to be dry prior to drilling, therefore a cofferdam would be required. The same methodology described above for the cofferdam associated with trestle construction would be used for falsework construction.

The design and location of the falsework will be determined by the contractor; however, Caltrans has assumed the following: 1) due to the width of the West Fork Russian River, falsework is expected to be below OHWM and within the floodplain; 2) the bents will be approximately 50 - 70 feet wide; 3) a bent will be needed every 30 feet (*i.e.,* 30 feet between each bent); 4) each bent will require 12 support piles; 5) support piles will be steel pipes ≤ 24 inches in diameter; and 6) temporary fill resulting from falsework below OHWM will be ≤ 0.004 acres (based on 7 pile bents supported on ≤ 24 inch steel pipe).

As described above, the width of the active channel is approximately 60 feet wide. Caltrans anticipates that a maximum of 2 falsework bents would be needed to span this length, and would be supported on a maximum of 24 steel piles. Falsework bents would not only span the active channel, but would also be required to span portions of the Russian River floodplain within the action area. At the proposed bridge location, the floodplain area extends an additional 85 feet west of the right bank of the active channel requiring a maximum of 3 falsework bents supported on 36 steel piles. Caltrans assumes that it will take a maximum of 600 strikes to install one steel pipe ≤ 24 inches, and assumes that a maximum of 5 piles will be installed per day. Installation of 5 steel piles per day would result in a maximum of 3,000 strikes per day, and result in approximately 12 pile driving days; each day will require approximately 1.5 hours of pile driving (Table 3).

1.3.5 Construction of New Bridge

1.3.5.1 Dewatering

Access to the creek bed is needed to complete construction, and while instream work will be conducted during the dry season when flows are at annual lows, a creek diversion will be necessary. To gain access, water from the creek will be temporarily diverted around the work area using a combination of methods for a “clear water” diversion. To perform a clear water diversion, cofferdams will be placed up and downstream of the worksite, this area would then be dewatered using a combination of screened pipes/pumps. Cofferdams will be comprised of sheet piles installed with a vibratory hammer in a rectangular shape. Once installed, water will then be diverted to an artificial waterway, created with plastic lined K-rail to ensure a water tight seal.

Instream construction is scheduled to occur between June 15 and October 1 of each year, and a maximum of 250 linear feet of the channel will be dewatered. While overall project construction may require three seasons to complete, dewatering activities would likely be limited to two construction seasons (2022-2023). California Coastal (CC) Chinook salmon and Central California Coast (CCC) steelhead, if present in the work area, will be collected and relocated prior to dewatering the work site.

Table 3. Summary of all Pile Driving Activities

Activity	Pile			No. of Piles	Max. No. of Piles Driven Per Day	No. of Strikes Per Pile	Avg. No. Strikes Per Day	Duration	
	Location	Type	Diameter (inches)					Approx. hours of Pile Driving Per Day	Total Pile Driving Days
Trestle	Active Channel	Steel H-Pile	≤ 24	36	6	550	3,330	1.5	6
	Floodplain	Steel H-Pile	≤ 24	60	6	550	3,330	1.5	10
Falsework	Active Channel	Steel Pile	≤ 24	24	5	600	3,000	1.5	5
	Floodplain	Steel Pile	≤ 24	36	5	600	3,000	1.5	8
New Bridge Piles	Active Channel	Steel H-Pile	≤ 24	21	6	550	3,330	1.5	4
	Floodplain	Steel H-Pile	≤ 24	42	6	550	3,330	1.5	7

1.3.5.2 Pile Driving

The proposed design for the new bridge includes construction of 6 piers and 2 abutments. Each of the 6 piers is comprised of 2 columns, with each column supported by 16 “10x57” steel H-piles. Piles are approximately 34 feet long and will be driven at each column location in a 4x4 matrix pattern. In total, 192 H-piles will be used in the construction of the bridge. It is anticipated that a total of 3 columns, or 63 H-piles, will be installed near and below the OHWM of the active channel, or within the floodplain. Caltrans assumes that it will take a maximum of 550 strikes to install one steel H-pile ≤24 inches, and assumes that a maximum of 6 piles will be installed per day. Installation of 6 H-piles per day would result in a maximum of 3,330 strikes per day, and result in approximately 11 pile driving days; each day will require approximately 1.5 hours of pile driving (Table 3). Permanent fill resulting from new bridge piles will be 0.012 acres.

At each abutment 20 “10x57” steel H-piles will be installed. To install these H-piles an impact pile driving rig will be utilized. The western abutment is located approximately 212 feet west of the western edge of the Russian River floodplain, and 291 feet west of the right bank of the active channel of the Russian River. Pile driving at the western abutment would occur at an elevation approximately 50 feet higher than the active channel, on dry land. The eastern abutment is located approximately 500 feet east of the left bank of the active channel of the Russian River. Pile driving at the eastern abutment would occur at an elevation approximately 30 feet higher than the active channel, on dry land. Because the 20 piles associated with the new bridge abutments will be installed outside the floodplain, and furthermore, on dry land, hydroacoustic impacts to listed species are not anticipated to occur as a result of this activity. Thus, these 20 piles will not be further discussed within this biological opinion.

Following pile driving, the final steps to complete construction of the new bridge include constructing the stem, soffit, and deck. Cranes would be utilized to lift rebar and other materials into place prior to pouring concrete. After the concrete is poured a bidwell roller paver would finish the concrete work, and backfilling behind the new abutments would occur. Asphalt would then be placed using a paving machine; after drying the final steps would be to install bridge railings using small hand tools and/or cranes. Following construction of the new bridge approximately 0.034 acres of new shade will be created.

1.3.6 Demolish Existing Structures

Following construction of the new bridge, traffic would be shifted to the new alignment and the existing bridge would be demolished. Demolition work would be accomplished from the existing bridge decks, access roads, and maintenance areas. Bridge deck, girders, concrete piers, abutments, and foundation will be demolished using a combination of hoe rams, cranes, excavators, and hand tools.[5] During demolition, existing RSP used to stabilize various piers will also be removed from the riverbed.[6] Concrete piers are typically knocked down using excavators with concrete rams. Once downed, material (including RSP) will be broken apart and/or loaded into trucks, and transported for disposal off site. Following removal of the existing structural elements, the channel will be regraded to pre-project grade utilizing in-kind materials. Demolition and removal of the existing bridge will result in approximately 0.006 acres of restored habitat.

To prevent construction debris from entering into the active channel, a debris containment system will be installed. Likely methods to contain debris include the following: 1) a containment structure may be built over the river using steel beams and wooden decking (tarps would be used in areas away from river); or 2) a "safe span" structure may be hung from existing steel beams to capture failing material over the river (tarps would be used in areas away from river).

1.3.7 Revegetation Activities

Following construction, Caltrans proposes to restore the riparian area temporarily affected by construction activities with self-sustaining native plants that are appropriate to the region. Approximately 0.98 acres will be revegetated following completion of the project. To aid in

[6] Please see details within Caltrans Addendum to the Biological Assessment for full details on demolition of existing bridge and RSP removal.

erosion control, a native seed mix will be hydroseeded in bare soil areas following construction. Please see Caltrans' addendum to the biological assessment for a draft revegetation plan. A final revegetation plan will be submitted to NMFS for review in coordination with the project's 1602 Lake and Streambed Alteration Agreement with the California Department of Fish and Wildlife.

As part of the Project, Caltrans will submit project construction plans to the Santa Rosa Caltrans Liaison for review according to the following schedule (or sooner, if available):

- 60% plans at least five months before construction;
- 90% plans at least three months before construction; and
- Final plans at least one month prior to construction.

Typical equipment used to complete the project is expected to include the following: excavators and loaders, dump trucks, forklifts, pile driving rigs, cranes, diesel impact hammer, pile drilling rig, baker tanks, K-rail, concrete pumping trucks, rolling compactors, bidwell and paver machines, hoe ram, and small hand tools.

Caltrans proposes to include several avoidance and minimization measures (AMMs) that will be implemented before, during, and after construction to prevent and minimize project-related effects to CCC steelhead, CC Chinook salmon and their critical habitat, and CCC coho salmon critical habitat. These measures include: working within the in-water work window (June 15 – October 1); ensuring proper handling and relocation of listed salmonids species during dewatering/diverting activities; ensuring establishment of revegetation areas; preventing introduction of contaminants into waterways; use of a debris containment system; ensuring complete removal and proper disposal of all construction waste; development a fish handling and relocation plan, stormwater pollution prevention plan, a habitat restoration and revegetation plan, hydroacoustic monitoring plan, and a spill prevention control and countermeasure plan. For a full list of AMMs and additional best management practices (BMPs) please see Caltrans' Biological Assessment (2020).

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

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

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

2.1 Analytical Approach

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

This biological opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR 402.02).

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

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

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

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

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

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

2.2.1 Species Description and Life History

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

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

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

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

Critical habitat is designated for CCC coho salmon in all accessible reaches throughout the ESU, however, CCC coho salmon are not currently known to inhabit the upper watershed area of the Russian River. Caltrans determined the proposed action is not likely to adversely affect endangered CCC coho salmon. Therefore, this biological opinion does not analyze effects to individual CCC coho salmon, and NMFS' concurrence for this species is documented below in the "Not Likely to Adversely Affect" Determinations (Section 2.12).

2.2.1.1 General Life History of Listed Species

2.2.1.1.1 Steelhead

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

Steelhead are 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 (Nielson and Fountain 2006). Winter-run steelhead enter natal streams as mature adults with well-developed gonads. They typically immigrate between December and April and spawn shortly after reaching spawning grounds (Shapovalov and Taft 1954; Moyle et al. 2008).

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

Upon emerging from redds, juvenile steelhead occupy edgewater habitats where flow velocity is lower and cover aids in predator avoidance. Rearing juveniles feed on a variety of aquatic and terrestrial invertebrates. As they grow, juveniles move into deeper pool and riffle habitats where they continue to feed on invertebrates and have been observed feeding on younger juveniles (Chapman and Bjornn 1969; Everest and Chapman 1972). Juveniles can spend up to four years rearing in freshwater before migrating to the ocean as smolts, although they typically only spend one to two years in natal streams (Shapovalov and Taft 1954; Busby et al. 1996; Moyle 2002). Successful rearing depends on stream temperatures, flow velocities, and habitat availability. Preferred water temperature ranges from 12 to 19°C and sustained temperatures above 25°C are generally considered lethal (Smith and Li 1983; Busby et al. 1996; Moyle 2002; McCarthy et al. 2009). In Central California streams, juvenile steelhead are able to survive peak daily stream temperatures above 25°C for short periods when food is abundant (Smith and Li 1983). Response to stream temperatures can vary depending on the conditions to which individuals are acclimated, however, consistent exposure to high stream temperatures results in slower growth due to elevated metabolic rates and lower survival rates overall (Hokanson et al. 1977; Busby et al. 1996; Moyle 2002; McCarthy et al. 2009).

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

Adult steelhead are known to be highly migratory during ocean residency but little is known of their habitat use and movements. They have been observed moving north and south along the continental shelf, presumably to areas of high productivity to feed (Barnhart 1986). Adults will typically spend one to two years in the ocean, feeding and growing in preparation for spawning (Shapovalov and Taft 1954; Busby et al. 1996). Upstream migration typically begins once winter rains commence and stream flows increase. For coastal systems 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).

2.2.1.1.2 Chinook salmon

Chinook salmon follow the typical cycle of Pacific salmon, hatching in freshwater, migrating to the ocean, and returning to freshwater to spawn and die. Diversity within this life cycle exists, however, in the time spent at each stage. Chinook salmon are classified into two groups, ocean-type and stream-type, based on the period of freshwater residence (Healey 1991; Meyers et al. 1998). Fall or late fall-run fish 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. Juveniles emigrate to estuarine or marine environments shortly after emergence from the red (Healy 1991). Stream-type fish are typically winter or spring-run fish that have a protracted adult freshwater residency, sometimes spawning several months after entering freshwater. Progeny of stream-type fish frequently spend one or more years in freshwater before emigrating. After emigrating, Chinook salmon remain in the ocean for two to five years and tend to stay in the coastal waters off California and Oregon (Healey 1991). Chinook salmon are also characterized by the timing of adult returns to freshwater for spawning, with the most common types referred to as fall-run and spring-run fish.

Chinook generally remain in the ocean for two to five years (Myers et al. 1998). Some Chinook salmon return from the ocean to spawn one or more years early. These early maturing fish are referred to as jacks (males) and jills (females). The low flows, high water temperatures, and sand bars that develop in smaller coastal rivers of coastal California during the summer months favor an ocean-type life history or fall-run (Kostow 1995). With this life history, adults enter freshwater between August and January (Fukushima and Lesh 1998; Chase *et al.* 2007) and smolts typically outmigrate as sub-yearlings between April and July (Myers *et al*. 1998). Fall-run fish typically enter freshwater with fully developed gonads, move rapidly to their spawning areas on the mainstem or lower tributaries of mainstem rivers (elevations of 200 to 1,000 feet), and spawn within a few weeks of freshwater entry. In contrast, spring-run fish inhabit large river systems with high elevation tributaries fed by melting snowpack. Spring-run fish enter river systems during peak snowmelt, between April and August, with undeveloped gonads that mature over the summer. These fish migrate when high flows facilitate passage into cold, headwater tributaries where the fish hold until they spawn later that fall.

Spawning generally occurs in swift, relatively shallow riffles or along the edges of fast runs at depths greater than 24 cm. Adult female Chinook salmon prepare redds in stream areas with suitable gravel composition, water depth, and velocity. Individual females spawn for five to fourteen days and will guard or defend their redd for two to four weeks before dying (Beauchamp *et al.* 1983). The number of eggs a female produces generally ranges from 2,000–17,000 (Groot and Margolis 1991) and is not directly correlated to fish size (Hassler 1987; Moyle 2002). Optimal spawning temperatures range between 5.6 and 13.9°C. Redds vary widely in size and location within the river. Preferred spawning substrate is clean, loose gravel, mostly sized between 1.3 and 10.2 cm, with fine sediment not exceeding 10 percent. Chinook salmon eggs incubate for 90 to 150 days depending on water temperature (Allen and Hassler 1986). Successful incubation depends on several factors, including dissolved oxygen levels, temperature, substrate size, amount of fine sediment, and water velocity. Maximum survival of incubating eggs and pre-emergent fry occurs at water temperatures between 5.6 and 13.3°C with an optimal temperature of 11.1°C. Alevins remain in the gravel for a month or longer (about four to six weeks) until they emerge as fry (Beauchamp *et al.* 1983; Allen & Hassler 1986, Moyle 2002). Fry emergence begins in December and continues into mid-April (Leidy and Leidy 1984).

After emergence, Chinook salmon fry seek out areas behind fallen trees, back eddies, undercut banks, and other cover (Everest and Chapman 1972). Cover, in the form of rocks, submerged aquatic vegetation, logs, riparian vegetation, and undercut banks provides food, shade, and protects juveniles from predation. As they grow larger, 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 (Chapman and Bjornn 1969; Everest and Chapman 1972; Holecek *et al.* 2009).

2.2.2 Status of Listed Species

NMFS assesses four population viability[7] parameters to discern the status of the listed ESUs and DPSs and to assess each species ability to survive and recover. These population viability parameters are abundance, population growth rate, spatial structure, and diversity (McElhany et

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

al. 2000). While there is insufficient data to evaluate these population viability parameters quantitatively, NMFS has used existing information to determine the general condition of the populations in the CCC steelhead DPS, the CC Chinook salmon ESU, and the factors responsible for the current status of these listed species.

The population viability parameters are used as surrogates for numbers, reproduction, and distribution, as defined in the regulatory definition of jeopardy (50 CFR 402.20). For example, abundance, population growth rate, and distribution are surrogates for numbers, reproduction, and distribution, respectively. The fourth parameter, diversity, is related to all three regulatory criteria. Numbers, reproduction, and distribution are all affected when genetic or life history variability is lost or constrained, resulting in reduced population resilience to environmental variation at local or landscape-level scales.

2.2.2.1 CCC Steelhead

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

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

CCC steelhead have experienced serious declines in abundance and long-term population trends suggest a negative growth rate, indicating the DPS may not be viable in the long-term. DPS populations that historically provided enough steelhead immigrants to support dependent populations may no longer be able to do so, thereby putting dependent populations at increased risk of extirpation. Recent status reviews and return data indicate an ongoing potential for the DPS to become endangered in the future (Good et al. 2005). In 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834). A CCC steelhead viability assessment completed in 2008 concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable[8], and that the limited information available did not indicate that any other CCC steelhead populations could be demonstrated to be viable (Spence et al. 2008).

In the Santa Cruz Mountains, the California Coastal Monitoring Program (CMP) has been recently initiated for CCC steelhead.[9] New information from three years of the CMP indicates that population sizes there are perhaps higher than previously thought. However, the long-term downward trend in the Scott Creek population, which has the most robust estimates of abundance, is a source of concern. Although steelhead occur in the Russian River, the ratio of hatchery fish to natural origin fish remains a concern. The viability of San Francisco Bay watershed populations remains highly uncertain. Population-level estimates of adult abundance are not available for any of the seven independent populations inhabiting the watersheds of the coastal strata (Novato Creek, Corte Madera Creek, Guadalupe River, Saratoga Creek, Stevens Creek, San Francisquito Creek, and San Mateo Creek). The scarcity of information on CCC steelhead abundance continues to make it difficult to assess whether conditions have changed appreciably since the previous status review assessment of Williams et al. (2011). On May 26, 2016, NMFS chose to maintain the threatened status of the CCC steelhead (81 FR 33468).

2.2.2.2 CC Chinook

The CC Chinook salmon ESU was historically comprised of approximately 32 Chinook salmon populations (Bjorkstedt et al. 2005). Many of these populations (about 14) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts. The remaining populations were likely more dependent upon immigration from nearby independent populations than dependent populations of other salmonids (Bjorkstedt et al. 2005).

Data on CC Chinook abundance, both historical and current, is sparse and of varying quality (Bjorkstedt et al. 2005). Estimates of absolute abundance are not available for populations in this ESU (Myers et al. 1998). In 1965, CDFG (1965) estimated escapement for this ESU at over 76,000. Most were in the Eel River (55,500), with smaller populations in Redwood Creek (5,000), Mad River (5,000), Mattole River (5,000), Russian River (500) and several smaller streams in Humboldt County (Myers et al. 1998). Currently available data indicate abundance is far lower, suggesting an inability to sustain production adequate to maintain the ESU′s populations. CC Chinook salmon populations remain widely distributed throughout much of the ESU. Notable exceptions include the area between the Navarro River and Russian River and the area between the Mattole and Ten Mile River populations (Lost Coast area). The lack of Chinook salmon populations both north and south of the Russian River (the Russian River is at the southern end of the species' range) makes it one of the most isolated populations in the ESU. Myers *et al.* (1998) reports no viable populations of Chinook salmon south of San Francisco, California.

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[8] Viable populations have a high probability of long-term persistence (> 100 years).

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

Because of their prized status in the sport and commercial fishing industries, CC Chinook salmon have been the subject of many artificial production efforts, including out-of-basin and out-of-ESU stock transfers (Bjorkstedt et al. 2005). Therefore, it is likely that CC Chinook salmon genetic diversity has been significantly adversely affected despite the relatively wide population distribution within the ESU. An apparent loss of the spring-run Chinook life history in the Eel River Basin and elsewhere in the ESU also indicates risks to the diversity of the ESU.

Data from the 2009 adult CC Chinook salmon return counts and estimates indicated a further decline in returning adults across the range of CC Chinook salmon on the coast of California (Jeffrey Jahn, NMFS, personal communication 2010). Ocean conditions are suspected as the principal short term cause because of the wide geographic range of declines (SWFSC 2008). However, the number of adult CC Chinook salmon returns in the Russian River Watershed increased substantially in 2010/2011 compared to 2008/09 and 2009/10 returns.[10] Increases in adult Chinook salmon returns during 2010/2011 have been observed in the Central Valley populations as well.

Using an updated analysis approach, Williams *et al.* (2011) did not find evidence of a substantial change in conditions since the last status review (Good *et al.* 2005). Williams *et al.* (2011) found that the loss of representation from one diversity stratum, the loss of the spring-run history type in two diversity substrata, and the diminished connectivity between populations in the northern and southern half of the ESU pose a concern regarding viability for this ESU. Based on consideration of this updated information, Williams *et al.* (2011) concluded the extinction risk of the CC Chinook salmon ESU has not changed since the last status review. On August 15, 2011, NMFS affirmed no change to the determination that the CC Chinook salmon ESU is a threatened species, as previously listed (76 FR 50447). The latest status review of this CC Chinook salmon determined that there is no change in the extinction risk for this ESU (Spence 2016).

The NMFS's recovery plan (NMFS 2016) for the CC Chinook salmon ESU identified the major threats to recovery. These major threats include: channel modification, roads, logging and timber harvesting; water diversions and impoundments; and severe weather.

2.2.3 Status of Critical Habitat

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

[10] http://www.SCWA.ca.gov/chinook/

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

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

The condition of CCC coho salmon, CCC steelhead and CC Chinook salmon critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions 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[11]: 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 coho and Chinook salmon ESUs and steelhead DPSs. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

2.2.4 Additional Threats to Critical Habitat

Another factor affecting the rangewide status of coho salmon, Chinook salmon and steelhead, and their critical habitat at large, is climate change. Impacts from global climate change are already occurring in California. For example, average annual air temperatures, heat extremes,

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

and sea level have all increased in California over the last century (Kadir et al. 2013). Snow melt from the Sierra Nevada has declined (Kadir et al. 2013). However, total annual precipitation amounts have shown no discernible change (Kadir et al. 2013). Listed salmonids may have already experienced some detrimental impacts from climate change. NMFS believes the impacts on listed salmonids to date are relatively minor but increasing (see below) because natural, and local, climate factors likely still drive most of the climatic conditions salmonids experience, and many of these factors have much less influence on salmonid abundance and distribution than human disturbance across the landscape.

The threat to 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 model project heavier and warmer precipitation. Extreme wet and dry period are projected, increasing the risk of both flooding and droughts (DWR 2013). 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 salmonid habitat by, for example, reducing stream flows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to salmonids. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia et al. 2002, Ruggiero et al. 2010). In marine environments, ecosystems and habitats important to juvenile and adult salmonids are likely to experience changes in temperatures, circulation, water chemistry, and food supplies (Brewer and Barry 2008; Feely 2004; Osgood 2008; Turley 2008; Abdul-Aziz et al. 2011; Doney et al. 2012). These projections are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007; Santer et al. 2011).

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the Project encompasses the active channel of the Russian River where the existing Calpella Bridge and the Redwood Valley Undercrossing cross the river[12], as well as the active channel 240 feet upstream and 440 feet downstream of the bridges that are subjected to increased turbidity, sedimentation, and underwater construction noise. The action area also includes areas needed for access and staging, existing roadway, shoulders, and non-vegetated turnouts.

[12] Latitude/longitude: 39.243378, -123.200142

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 West Fork Russian River watershed drains an area of approximately 37 square miles, with the action area located at the downstream end of the watershed, just upstream of the confluence with the Forsythe Creek watershed. Stream flow in the action area varies from intermittent flow in the summer to high flow events in the winter that can reach up to 7,000 cubic feet per second (LCAO 2017). Mid-water column water temperatures were collected from pools and riffles throughout the action area, both shaded and unshaded; values ranged from 21.4 ^{o}C to 23.4 ^{o}C and represent the lower end of the lethal temperature range for salmonids, resulting in suboptimal summer rearing conditions within the action area. Waters within the action area were assessed by the SWRCB in 2017, and were determined to be impaired for aluminum, sedimentation/siltation, and water temperature. Shortly below the action area, the West Fork and East Branch Russian River meet creating the mainstem Russian River. Coyote Valley Dam is located on the East Branch Russian River, shortly above confluence of these two forks. Construction of Coyote Valley Dam and past gravel mining have likely caused the Russian River channel to incise, and has contributed to the streambank failure observed in many tributaries of the Russian River, including the West Fork Russian River. Additionally, the Coyote Valley Dam not only acts as a physical barrier for salmonids, but it also has altered temperatures, downstream discharge, and sediment transport.

2.4.1 Status of Listed CCC Steelhead and CC Chinook Salmon in the Action Area

Factors, which have and are currently affecting salmonids within the action area are extensive habitat degradation, a long history of artificial propagation with the use of non-native stocks, and recent droughts and poor ocean conditions (Weitkamp *et al.* 1995). Logging, agriculture and mining activities, urbanization, stream channelization, dams, wetland loss, water withdrawals and unscreened diversions for irrigation have contributed to the decline of salmonids within the Russian River watershed. Sub-watersheds such as the West Fork Russian River have altered streambank and channel morphology, elevated summer stream temperatures, low quality spawning and rearing habitats, reduced connectivity of habitats and recruitment of large organic debris. Elevated stream temperatures during the summer may limit steelhead juvenile rearing opportunities in the West Fork Russian River (CDFG 2002). Many juvenile steelhead likely move downstream into the mainstem Russian River where summer stream temperature is suitable due to cold-water flow releases from Lake Mendocino (SCWA 2003). Forsythe Creek is a major tributary to the West Fork Russian River, also has a natural producing population of steelhead (CDFG 2002). Steelhead and Chinook salmon currently utilize the action area for spawning and seasonal rearing (MRCD 2016). While Chinook salmon do rear within the action area, most juveniles are expected to emigrate to estuarine and/or marine environments by mid-June.

The current status of natural origin steelhead abundance in the West Fork Russian River or Russian River watershed is unknown. Since 2003 migration for adult steelhead into the upper watershed has improved due to the restoration of passage conditions at the previous location of the 'Mumford Dam' which is located upstream of the proposed project. In 2015, approximately 1.8 miles upstream from the action area, construction began on a Caltrans local assistance project (the School Way Bridge Replacement) that required dewatering of approximately 280 linear feet of the river (Caltrans 2020). During this project, 294 juvenile steelhead were captured and relocated. Because of the close proximity of this project to the proposed project, NMFS assumes that a similar population of steelhead may be present within the action area during project activities. During this same dewatering event, Caltrans did not encounter any juvenile Chinook salmon, but despite this, their presence within the action area is assumed. The closest observation of Chinook salmon to the action area was recorded at the Coyote Valley Fish Facility (CVFF), located approximately 3.3 linear miles south of the project location along the East Branch of the Russian River. In a review of the weekly anadromous fish counts from the CVFF, one adult Chinook salmon was observed in December 2013. Thus, juvenile steelhead and Chinook salmon are expected to be absent or in low numbers within the action area during the summer work window. Furthermore, during the summer work window juvenile salmonids are expected to be greater than 2 grams.

2.4.2 Status of Critical Habitat in the Action Area

Habitat conditions throughout the upper Russian River watershed have been impacted by agricultural development and rural development over the past 150 years. Many landowners have encroached on the floodplain, reduced the riparian areas along the river, and many divert stream flow for vineyards and domestic purposes. In general, these actions have created stream conditions throughout the valley reaches of the upper Russian River tributaries, including the West Fork, which have less than optimal flows and stressful summer temperature conditions for juvenile steelhead (Steiner Environmental Consulting 1996).

Impacts resulting from river incision in the West Fork Russian River include the loss of bank stability and riparian vegetation contributing to increased stream temperatures resulting in reduced summer rearing habitat for juvenile steelhead. Recently, a wildfire occurred in October 2017 that burned major sections of the upper Russian River watershed. Erosion control measures were implemented in most burned areas, but post fire run-off modeling indicates increased overland flow from the burned areas to the smaller sub-basins of the upper West Fork Russian River (Calfire 2017). This increased run-off from burned areas is likely to reduce habitat quality in some affected tributaries and stream reaches of the West Fork via sedimentation of pools and spawning gravels.

While the action area is comprised of several shaded pool habitats, overhanging riparian vegetation that offer additional shade and cover, and large woody debris; poor habitat quality has likely led to reduced numbers of juvenile salmonids potentially utilizing this area. The streambed of the river within the action area is comprised of silt, gravel, cobbles, and boulder sized substrate.

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

No known previous Section 7 consultations or Section 10 permits have occurred within the action area.

2.5 Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

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

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

The following assumptions were made to complete the effects analysis below:

- As described in the Biological Assessment (2020), because the final design for the temporary trestles and falsework will be determined by the contractor at the time of construction, pile driving assumptions have been made by Caltrans' construction engineers to best estimate the installation method, pile size, and design layouts. Thus, the effects to listed species resulting from underwater construction noise below represent the worst-case scenarios. Please see Section 2.5.5 Disturbance or Direct Injury from Construction Noise below for further details.
- Caltrans assumes that noise propagation in rivers is limited by the sinuosity (meandering) of a system as described in WSDOT 2019. Based on the information, and aerial imagery of the proposed bridge alignment, Caltrans' hydroacoustic assessment for the project is limited by the closest bends within the Russian River as they relate to the action area. Please see Sections 2.3 and 2.5.5 below for further details.

2.5.1 Fish Collection and Relocation

To facilitate the completion of the project, a portion of the Russian River will need to be dewatered. As discussed above, a maximum amount of 250 linear feet of the Russian River will be dewatered. The project proposes to collect and relocate fish in the work area prior to, and during, dewatering to avoid fish stranding and exposure to construction activities. Before and during dewatering of the construction site, juvenile salmonids will be captured by a qualitied biologist using one or more of the following methods: dip net, seine, thrown net, block net, minnow trap, and electrofishing. Collected salmonids will be relocated to an appropriate stream reach that will minimize impacts to captured fish, and to fish that are already residing at the release site. Since construction is scheduled to occur between June 15 and October 1, relocation activities will occur during the summer low-flow period after emigrating smolts have left and before adults have immigrated for spawning. Only juvenile salmonids are expected to be in the action area during this construction period. Therefore, NMFS expects capture and relocation of listed salmonid species will be limited to pre-smolting and young-of-the-year juveniles.

Fish collection and relocation activities pose a risk of injury or mortality to rearing juvenile salmonids. Any fish collecting gear, whether passive (Hubert 1996) or active (Hayes et al. 1996) has some associated risk to fish, including stress, disease transmission, injury, or death. The amount of unintentional injury and mortality attributable to fish capture varies widely, depending on the method used, the ambient conditions, and the expertise and experience of the field crew. Since fish relocation activities will be conducted by qualified fisheries biologists following NMFS electrofishing guidelines (NMFS 2000), injury and mortality of juvenile salmonids during capture and relocation will be minimized. Based on prior experience with current relocation techniques and protocols likely to be used to conduct the fish relocation, unintentional mortality of listed juvenile salmonids expected from capture and handling procedures is not likely to exceed 3 percent.

Relocated fish may also have to compete with other fish causing increased competition for available resources such as food and habitat. Responses to crowding by salmonids include self-thinning, resulting in emigration and reduced salmonid abundance with increased individual body size within the group, and/or increased competition (Keeley 2003). Some of the fish released at the relocation sites may choose 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. Although sites selected for relocation fish will be pre-approved by NMFS, they should have similar water temperatures as the capture sites, and should have adequate habitat to allow for survival of transported fish and fish already present. NMFS cannot accurately estimate the number of fish likely to be affected by competition, but does not expect this short-term stress to reduce the individual performance of juvenile salmonids, or cascade through watershed population of these species based on the area that will likely be affected and the relatively small number of salmonids likely to be relocated. Fish that avoid capture during relocation may be exposed to risks described in the following section on dewatering (see Section 2.5.2 below).

To estimate the number of juvenile steelhead that may be present in the action area, we used data from Caltrans' School Way Bridge Replacement Project which encountered 294 juvenile steelhead in a dewatered reach of 280 linear feet (Caltrans 2020). Using this data, and the proposed dewatering length of 250 linear feet, NMFS estimates that no more than 263 juvenile steelhead will be present in the dewatered area when relocation and dewatering activities occur each year.[13] Considering environmental variability including, inter-annual variation in temperature, variations in predator or prey abundance, habitat conditions in the action area, and other factors, NMFS assumes that during the two years needed to complete dewatering as many as 25 percent more juvenile steelhead may be present in the area to be dewatered each year. The 25 percent increase is based on NMFS' best professional judgement as to the likely variability in steelhead density during the two years needed to complete dewatering. If 25 percent more than 263 juvenile steelhead are present this would result in 328 steelhead present in the 250 foot dewatered area during each dewatering event.[14]

Despite Caltrans encountering zero juvenile Chinook during the same dewatering event described above (School Way Bridge Replacement Project), and that most juvenile Chinook migrate to estuarine or marine environments by June 15th of each year, low numbers of juvenile Chinook may be rearing in the action area during the low-flow summer period when dewatering will occur. Therefore, NMFS assumes a small number of juvenile Chinook may be encountered and relocated during dewatering.

Applying applicable AMMs to fish collection, relocation, and dewatering activities is expected to appreciably reduce the effects of project actions on juvenile salmonids. Specifically, fish

[13] 294 fish encountered / 280 feet of dewatered river = 1.05 fish per foot of river. 1.05 fish per foot*100 feet of river = 105 fish per 100 feet of river. 250 feet of dewatered river*105 fish per 100 feet of river = 262.5 fish estimated to be present in the proposed dewatered reach. Rounding this up to whole numbers yields an estimate of 263 juvenile steelhead to be in the area during dewatering.

[14] (263*0.25)*263 = 328 juvenile steelhead.

collection and relocation activities conducted by NMFS-approved fisheries biologists will ensure proper equipment operation and application of NMFS guidelines thereby minimizing injury and mortality to juvenile salmonids. Restricting the work window to June 15 through October 1 will limit the effects to stream rearing juvenile salmonids. NMFS expects applying AMMs will effectively minimize injury and mortality to juvenile steelhead and Chinook salmon in the action area.

2.5.2 Project Site Dewatering

As described above, the project will require dewatering to complete. Cofferdams constructed out of concrete sheet piles in conjunction with a clear water bypass system (see Section 1.3.5.1 for details) will be used to temporarily divert flows around work sites during construction. NMFS anticipates temporary changes to instream flow within, and downstream, of the project site during installation of the diversion system, and during dewatering operations. Once the installation of the diversion system is complete, stream flow above and below the work site should be the same as free-flowing pre-project conditions, except within the dewatered reach where stream flow is bypassed. These fluctuations in flow are anticipated to be small, gradual, and short-term, but are expected to cause a temporary loss, alteration, and reduction of aquatic habitat, and, in the case of areas that will be dewatered, will likely result in mortality of any salmonids that avoid capture during fish relocation activities.

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

Dewatering operations may affect benthic (bottom dwelling) aquatic macroinvertebrates; an important food source for salmonids. Benthic aquatic macroinvertebrates within the project site may be killed or their abundance reduced when river habitat is dewatered (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from stream flow diversions and dewatering will be temporary because construction activities will be relatively short lived and the dewatered reach will not exceed 250 linear feet. Rapid recolonization (typically one to two months) of disturbed areas by macroinvertebrates is expected following rewatering (Cushman 1985, Thomas 1985, Harvey 1986). In addition, the effect of macroinvertebrate loss on juvenile salmonids in likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream flow, if present, will be bypassed around the project work site. Based on the foregoing, juvenile salmonids are not anticipated to be exposed to a reduction in food sources from the minor and temporary reduction in aquatic macroinvertebrates as a result of dewatering activities.

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

2.5.3 Increased Sedimentation and Turbidity

The proposed project will result in disturbance of the streambed and banks for construction. Construction activities within the action area may result in disturbance of the dewatered stream bed and banks for equipment access, placement and removal of stream diversion structures, and sediment removal and placement. These activities are likely to dislodge previously armored and sequestered inter-gravel fine sediment allowing it to be mobilized when the action area re-waters after in-water work is completed. Sediment may affect fish by a variety of mechanisms. High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelley 1961, Bjornn et al. 1977, Berg and Northcote 1985), reduce growth rates (Crouse et al. l 981), 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. Increased sediment deposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles (Alexander and Hansen 1986).

Although chronic elevated sediment and turbidity levels may affect salmonids and critical habitat, the temporary increase in sedimentation and turbidity resulting from the activities included in this project are not expected to rise to levels sufficiently high enough to adversely affect salmonids. Sedimentation and turbidity are most likely to increase during construction and removal of temporary water diversion structures, as well as during post-construction rewetting of the channel. The application of AMMs to all aspects of project planning, implementation, and cleanup is expected to substantially reduce or eliminate the impacts of sedimentation and turbidity on salmonids. Limiting the work window to June 15 through October 1 will limit any impacts to juvenile life stages. Additionally, Caltrans proposes AMMs and BMPs (associated with its storm water pollution prevent plan) specifically aimed at reducing erosion and scour in storage and staging areas, riparian areas, and water diversions (Caltrans 2020). With the implementation of these AMMs and BMPs, NMFS anticipates that any elevated turbidity levels would be small, temporary, and well below levels and durations shown to impact salmonids. NMFS expects any sediment or turbidity generated by the project would not extend more than 100 feet downstream of the work sites, based on the methods used to control sedimentation and turbidity. Thus, NMFS does not anticipate this project to result in harm, injury, or behavioral impacts to juvenile salmonids associated with exposure to elevated suspended sediment levels that could reduce their survival chances.

2.5.4 Pollution from Hazardous Materials and Contaminants

Operating equipment in and near streams has the potential to introduce hazardous materials and contaminants into streams. The equipment needed to complete the Project has the potential to release debris, hydrocarbons, concrete, and similar contaminants into surface waters. Potentially hazardous materials include wet and dry concrete debris, fuels, and lubricants. Spills, discharges, and leaks of these materials can enter streams directly or via runoff. If introduced into streams, these materials could impair water quality by altering the pH, reducing oxygen concentrations as the debris decompose, or by introducing toxic chemicals such as hydrocarbons or metals into aquatic habitat. Oils and similar substances form construction equipment can contain a wide variety of polynuclear hydrocarbons (PAHs) and metals. PAHs can alter salmonid egg hatching rates and reduce egg survival as well as harm the benthic organisms that are a salmonid food source (Eisler 2000). Disturbance of streambeds by heavy equipment or construction activities can also cause the resuspension and mobilization of contaminated stream sediment with absorbed metals.

These effects have the potential to harm or injure exposed fish and temporarily degrade habitat. However, proposed AMMs will substantially reduce or eliminate the potential for construction material and debris to enter waterways. Limiting the work window to the dry season from June 15 to October 1 will limit hazardous material exposure to juvenile salmonids and eliminate potential for contaminants to adversely affect the most sensitive life stages. 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 streams via runoff. Finally, the debris containment system will eliminate contaminants from entering the creek during construction activities. Due to these measures, conveyance of toxic materials into active waters during project construction is not expected to occur, and the potential for the project to degrade water quality and adversely affect salmonids is improbable.

2.5.5 Elevated Underwater Sound

To complete the project, pile driving is anticipated to be utilized during construction of the trestles, falsework, and new bridge pier columns. Exposure to high levels of underwater sound, such as those generated by impulsive sound sources resulting from pile driving with impact hammers can injure or kill fish. Pathologies of fish associated with very high sound level exposure and drastic changes in pressure are collectively known as barotraumas. Barotraumas range from non-lethal to lethal depending on explosion characteristics. Lethal injuries include hemorrhage and rupture of blood vessels and internal organs, including the swim bladder and kidneys. Death can be instantaneous, occur within minutes after exposure, or several days later. Gisiner (1998) reports swim bladders of fish can perforate and hemorrhage when exposed to blast and high-energy impulse noise under water, and Gaspin (1975) reports that barotraumas may result in the rupture of capillaries in the internal organs and maceration of the kidney tissues. Non-lethal barotrauma may result in altered physiological states, including changes in scale loss, hormone levels, sensory detection, tissue damage, embolisms, and possible changes in behaviors that increase the fish's risk of exposure to predation (Linton *et al.* 1985; Popper *et al.* 2004; Scheer *et al.* 2009) or other decreased fitness consequences.

Hearing loss in fishes can occur from exposure to high intensity sounds, which can overstimulate the auditory system of fishes and may result in temporary threshold shifts (TTS). TTS is considered a non-injurious temporary reduction in hearing sensitivity. Physical ear injury may also occur for fish exposed to high levels or continuous sound, manifested as a loss of hair cells, located on the epithelium of the inner ear (Hastings and Popper 2005). These hair cells are capable of sustaining injury or damage that may result in a temporary decrease in hearing sensitivity. However, this type of noise-induced hearing loss in fishes is generally considered recoverable, as fish possess the ability to regenerate damaged hair cells (Lombarte *et al.* 1993; Smith *et al.* 2006). Permanent hearing loss has not been documented in fish. Even if threshold shifts in hearing do not occur, loud sounds can mask the ability of fish to hear their environment. This effect from loud sound exposure is referred to as acoustic or auditory masking. Masking generally results from an unwanted or unimportant sound impeding a fish's ability to hear sounds of interest.

Underwater sound exposures have also been shown to alter the behavior of fishes (Hastings and Popper 2005). The observed behavioral changes include startle responses and increases in stress hormones. Exposure to pile driving sound pressure levels (SPLs) may also result in "agitation" of fishes indicated by a change in swimming behavior detected by Shin (1995), or "alarm" detected by Fewtrell (2003). Other potential changes include reduced predator awareness and reduced feeding. The potential for adverse behavioral effects will depend on a number of factors, including the sensitivity to sound, the type and duration of the sound, as well as life stages of fish that are present in the areas affected by underwater sound produced during pile driving. A fish that exhibits a startle response to a sudden loud sound may not necessarily be injured, but it is exhibiting behavior that suggests it perceives a stimulus indicating potential danger in its immediate environment. However, fish do not exhibit a startle response every time they experience a strong hydroacoustic stimulus.

In order to assess the potential effects to fish exposed to pile driving sound, a coalition of federal and state resource and transportation agencies along the West Coast, the Fisheries Hydroacoustic Working Group (FHWG), used data from a variety of sound sources and species to establish interim acoustic criteria (Table 4) for the onset of injury to fishes from impact pile driving exposure (FHWG 2008). Most historical research has used peak pressure to evaluate the effects on fishes from under water sound. Current research, however, suggests that sound exposure level (SEL), a measure of the total sound energy expressed as the time-integrated, sound pressure squared, is also a relevant metric for evaluating the effects of sound on fishes. An advantage of the SEL metric is that the acoustic energy can be accumulated across multiple events and expressed as the cumulative SEL (cSEL). Therefore, a dual metric criteria was established by the FHWG and includes a threshold for peak pressure (206 dB) and cSEL (187 dB for fishes 2 grams or larger and 183 dB for fishes smaller than 2 grams). Injury would be expected if either threshold is exceeded. There is uncertainty as to the behavioral response of fish to underwater sound produced when driving piles in or near water, NMFS believes a 150 dB root mean square pressure (RMS) threshold for behavioral responses for salmonids is appropriate.

Table 4: Underwater Noise Thresholds to Fish Exposed to Elevated Levels of Underwater Sounds Produced During Pile Driving

Effect	Metric	Fish Mass	Threshold
Onset of Physical Injury	Peak Pressure	N/A	206 dB (re: 1 μPa)
	Accumulated Sound Exposure Level (SEL)	≥ 2g	187 dB (re: 1 μPa²●sec)
		< 2g	183 dB (re: 1 μPa²●sec)
Adverse Behavioral Effects	Root Mean Square Pressure (RMS)	N/A	150 dB ((re: 1 μPa)

Impact pile driving can generate elevated underwater sound that, depending on the specifics of the action and level of exposure, have the potential to result in impacts to ESA-listed fish. With pile driving, the underwater sound pressure waves originate with the contact of the hammer with the top of the pile. As the pile is driven into the substrate and meets resistance, a wave of energy travels down the pile and causes the pile to resonate radially and longitudinally like a bell. Most of the acoustic energy is a result of the outward expansion and inward contraction of the walls of the pile as the compression waves moves down the pile from the hammer to the end of the pile buried in the substrate. This sends an underwater pressure wave propagating outward from the pile in all directions. Pressures are most intense at the source and diminishes with increasing distance from the source; however, pressures may also be transmitted through the substrate and enter the water column some distance from the source; potentially resulting in additive hydroacoustic effects or hydroacoustic effects occurring from actions in upland areas near water. As pressure waves are transmitted through the water, they pass through the tissues through any fish that are in the area and compress anatomical areas of the fish that are of relatively low density, such as swim bladders. This compression can cause rapid cyclic volumetric changes of the swim bladder that can result in barotraumas such as those described above. The following subsections assess the potential for elevated underwater sound effects likely to result during pile driving activities.

2.5.5.1 Hydroacoustic Effects Expected from Pile Driving

As described in Sections 1.3.4 and 1.3.5, Caltrans proposes to install piles using an impact pile driver between June 15 and October 1. To support the trestles, up to 96 steel H-piles, ≤ 24-inches, will be temporarily installed; up to 60 steel pipes, ≤ 24 inches, will be temporarily installed to support the falsework; and 63 steel H-piles, ≤ 24 inches, will be permanently installed to support the new bridge.

Caltrans performed a hydroacoustic analysis to determine the potential levels of elevated underwater sound that ESA-listed fish may be exposed to during the project. This analysis used standard methods for evaluating hydroacoustic effects that uses specific details of the pile driving actions proposed to occur during implementation of the action (see Sections 1.3.4. and 1.3.5 for details), and data from previous pile driving events with similar methods, pile sizes and pile types to determine effects likely to occur (Caltrans 2020). Although the exact method utilized for sound attenuation will be determined by the contractor, Caltrans will develop a non-standard special provision instructing the contractor to incorporate one of the following attenuations mechanisms: bubble curtain, double walled isolation casing, or a dewatered isolation casing. As a result of the use of one of the aforementioned attenuation methods, it is assumed that a maximum of 5 dBs of sound reduction will occur. Based on Caltrans' hydroacoustic analysis, impact pile driving of steel H-piles for the trestles is:

- likely to generate sound pressures greater than or equal to 206 dB within an approximately 0.06 acre area of the West Fork Russian River approximated by a circle with a 33-foot-radius centered around each proposed pile;
- likely to generate sound pressures greater than or equal to 187 dB within an approximately 0.21 acre area of the West Fork Russian River approximated by a circle with a 98-foot-radius centered around each proposed pile;
- likely to generate sound pressures greater than or equal to 183 dB within an approximately 0.34 acre area of the West Fork Russian River approximated by a circle with a 131-foot-radious centered around each proposed pile; and
- likely to generate sound pressures greater than or equal to 150 dB within an approximately 1.30 acre area of the West Fork Russian River approximated by a circle with a 440-foot-radious centered around each proposed pile.

Impact pile driving of steel pipes for the falsework is:

- likely to generate sound pressures greater than or equal to 206 dB within an approximately 0.06 acre area of the West Fork Russian River approximated by a circle with a 33-foot-radius centered around each proposed pile;
- likely to generate sound pressures greater than or equal to 187 dB within an approximately 0.39 acre area of the West Fork Russian River approximated by a circle with a 177-foot-radius centered around each proposed pile;
- likely to generate sound pressures greater than or equal to 183 dB within an approximately 0.48 acre area of the West Fork Russian River approximated by a circle with a 213-foot-radious centered around each proposed pile; and
- likely to generate sound pressures greater than or equal to 150 dB within an approximately 1.30 acre area of the West Fork Russian River approximated by a circle with a 440-foot-radious centered around each proposed pile.

Impact pile driving of steel H-piles for the new bridge is:

- likely to generate sound pressures greater than or equal to 206 dB within an approximately 0.06 acre area of the West Fork Russian River approximated by a circle with a 33-foot-radius centered around each proposed pile;
- likely to generate sound pressures greater than or equal to 187 dB within an approximately 0.21 acre area of the West Fork Russian River approximated by a circle with a 98-foot-radius centered around each proposed pile;

- likely to generate sound pressures greater than or equal to 183 dB within an approximately 0.34 acre area of the West Fork Russian River approximated by a circle with a 131-foot-radious centered around each proposed pile; and
- likely to generate sound pressures greater than or equal to 150 dB within an approximately 1.30 acre area of the West Fork Russian River approximated by a circle with a 440-foot-radious centered around each proposed pile.[15]

2.5.5.2 Assessment of Hydroacoustic Effects on Salmonids

By restricting pile driving to the period between June 15 and October 1 the project will avoid the average migration season, therefore no smolts or adult salmonids are expected to be transiting the action area during pile driving. Juvenile salmonids may still be present within the action area during this time period; although, in low numbers given the suboptimal summer temperatures, and juvenile emigration timing to estuarine/marine environments (see Section 2.4.1).

Juvenile salmonids greater than 2 grams in weight could occur in the action area year round, and could be exposed to hydroacoustic effects resulting from the pile driving activities that are proposed to complete the project (see Section 2.5.5.1 above). Juvenile salmonids exposed to these effects could experience barotrauma resulting in injury or mortality (see Section 2.5.5). Juvenile salmonids could also experience sub-injurious disturbance (see Section 2.5.5). Specifically, impact pile driving of steel pipes for falsework, and steel H-piles for trestles and the new bridge could generate sub-injurious SPLs, and SPLs that could result in injury or mortality (see Section 5.5.1).

However, NMFS estimates that only a very small number of threatened juvenile salmonids may be disturbed, injured, or killed by the project because few, if any, individuals are likely to be exposed to these effects. NMFS expects the densities of juvenile salmonids in the action area to be low (see Section 2.4.1) and most juvenile salmonids within the action area will likely disperse from the active work site during construction work. Because densities of juvenile salmonids in the action area are expected to be low (as described above; see also Section 2.4.1), and the area where SPLs are expected to meet or exceed 206 dB is a limited area of the West Fork Russian River (approximately 0.06 acres), and actions resulting in these high SPLs will last for very short periods of time (1.5 hours per day for 39 days during the pile driving actions[16]; see Sections 1.3.4 and 1.3.5), and the effects will not persist beyond the actions resulting in their effects, we expect that very few juvenile salmons may be exposed to SPLs of 206 dB or greater. Therefore, we expect that very few, if any, juvenile salmonids are likely to be killed by exposure to elevated underwater SPLs of 206 dB or greater resulting from the pile driving activities needed to complete the project. NMFS similarly expect that very few, if any, juvenile salmonids will

[15] Estimated based on measurements within the action area as identified within the biological assessment (Caltrans 2020).

[16] Note: because the project is expected to take place over multiple construction years (see Section 1.3 for details), and pile driving activities associated with falsework and trestles will occur during one construction season, and the pile driving activities associated with the new bridge structure will occur during a separate construction season, all 39 pile driving days will not be consecutive.

experience injury or mortality resulting from accumulated exposure to elevated underwater SPLs. To experience injury or mortality resulting from accumulated elevated underwater sound exposure, an individual salmonid would need to remain continuously within the range of 187 dB[17] or greater for a sufficient period of time to experience accumulated exposure injury. For the same reasons described above for potential exposure of juvenile salmonids to SPLs of 206 dB or greater (i.e. few fish, limited area of exposure, limited and discrete duration of exposure), few juvenile salmonids are expected to be exposed to SPLs of 187 dB or greater. Furthermore, few juvenile salmonids, if any, are expected to remain stationary within the action area long enough to accumulate SEL to levels which cause injury or mortality. Because it is unlikely that very few, if any, juvenile salmonids will be exposed to accumulated SPLs sufficient to cause injury or mortality, we expect very few, if any, juvenile salmonids will be injured or killed by cumulative exposure to elevated underwater SPLs resulting from the implementation of the project.

Beyond the zone of the potential injury and mortality, elevated sound levels may result in disturbance and behavior effects during pile driving activities. During construction, pile driving activities associated with installation of H-piles for trestles, steel pipes for falsework, and H-piles for the new bridge are projected to exceed 150 dB RMS (see Section 2.5.5.1). Fish exposed to these sound levels may demonstrate temporary abnormal behavior indicative of stress, or exhibit a startle response. A fish that exhibits a startle response may not be injured, but is exhibiting behavior that suggests it perceives a stimulus indicating potential danger in its immediate environment. Fish may also avoid the area due to the elevated underwater sound levels. NMFS anticipates that juvenile salmonids will exhibit startle and avoidance behavioral reactions. Due to the availability of habitat downstream of the action area, and anticipated behavioral responses, juvenile salmonids are expected to react by swimming away from the action area. Adequate habitat downstream of the action area will provide startled fish sufficient area to escape, and elevated sound levels are expected to result in minor and temporary behavioral effects on these individuals.

2.5.6 Removal of Riparian Vegetation and Habitat Loss

The project will result in temporary reductions in riparian vegetation during tree removal for construction access and staging, and during construction of the new bridge. Riparian vegetation helps maintain stream habitat conditions necessary for salmonid growth, survival, and reproduction. Riparian zones and wetland/aquatic vegetation serve important functions in stream ecosystems such as providing shade (Poole and Berman 2001), sediment storage and filtering (Cooper et al. 1987, Mitsch and Gosselink 2000), nutrient inputs (Murphy and Meehan 1991), water quality improvements (Mitsch and Gosselink 2000), channel and stream bank stability (Platts 1991), source of woody debris that creates fish habitat diversity (Bryant 1983, Lisle 1986, Shirvell 1990), and both cover and shelter for fish (Bustard and Narver 1975, Wesche et al. 1987, Murphy and Meehan 1991). Riparian vegetation disturbance and removal can degrade these

[17] Juvenile salmonids expected to occur in the action area would be greater than 2 grams (see Section 2.4.1); thus, we apply 187dB SEL metric (rather than the 183 SEL metric) when assessing the potential for accumulated exposure to result in injury (see Section 2.5.5 for a discussion of the dual metric criteria).

ecosystem functions and impair stream habitat. Removal of riparian vegetation increases stream exposure to solar radiation, leading to increases in stream temperature (Poole and Berman 2001).

Riparian vegetation provides much of the cover and habitat complexity required by migrating adults and rearing juveniles throughout the action area. Removal of riparian trees and vegetation within the work area will likely result in both permanent and temporary reductions in shade and cover for fish (approximately 1.15 acres). Conversely, approximately 0.98 acres of riparian habitat will be restored onsite, and approximately 0.034 acres of shade will result from the new bridge; thus, the net loss of riparian vegetation would be 0.136 acres. While the loss of cover may cause individual fish to seek alternative areas where suitable cover exists nearby, such temporary displacement of fish is not expected to reduce their individual performance because there is cover nearby to accommodate additional individuals without becoming overcrowded. Furthermore, AMMs applied to all stages of project planning, implementation, and site restoration is expected to substantially reduce the impact of riparian vegetation removal on salmonids (see Caltrans 2020 for more details). The project site will also be monitored for five years following construction to ensure the success of revegetation efforts to restore areas temporary impacted from removal of riparian revegetation. Thus, impacts of reduced shade and cover from removal of riparian vegetation are not expected to significantly change rearing and migratory behavior of individual salmonids within the action area.

Temporary piles utilized for the falsework and trestles, and permanent piles utilized for the new bridge structure are expected to remove up to 0.011 and 0.012 acres of habitat, respectively (see Sections 1.3.4 and 1.3.5). The combined total of permanent and temporary habitat loss as a result is anticipated to be 0.122 acres. Conversely, removal of the existing bridge will result in approximately 0.006 acres of restored habitat (see Section 1.3.6). Thus, the net loss of habitat would be 0.116 acres. Habitat loss, both from temporary and permanent piles, is not likely to substantially reduce the density of macroinvertebrates nor the habitat available to salmonids in the action area given the minimal area of habitat lost compared to the remainder of available habitat within the action area. Furthermore, if individual fish were to leave the area to seek alternative habitat for food, such temporary displacement of fish is not expected to reduce their individual performance because there is habitat downstream from the action area to accommodate additional individuals in search of prey. Thus, impacts of reduced habitat from pile installation are not expected to significantly change the foraging behavior of salmonids, substantially impact food availability, nor significantly reduce habitat availability within the action area.

Finally, alteration of channel habitat due to artificial fill from trestles and falsework (as described above) may potentially impact behavior of migrating/spawning adult salmonids and emigrating smolts. In the Russian River, salmonid adult upstream migrations/spawning are anticipated between approximately mid to late October through April each year, and smolt emigrations are anticipated between January through June each year. Salmonid adult migrations to the action area are not anticipated without the onset of significant early season rain events (prior to October 15). Though the project would be adhering to a summer work window of June 15 through October 1, with the potential to extend to October 15 if dry season low-flow conditions persist to avoid these sensitive life history events, the artificial fill from trestles and falsework would remain in the channel habitat for two winters and three construction seasons; thus, overlapping with anticipated adult migration/spawning and smolt emigration events (see Sections 1.3.4 and 1.3.5). While the design of the trestle and falsework will be determined by the contractor, and may be built to span the channel, Caltrans assumes that there would be approximately 20 feet between each trestle bent and approximately 30 feet between each falsework bent (see Section 1.3.4). Based on the relatively small footprint of the artificial fill needed to support the trestle and falsework (see above), the spacing between bents associated with trestle and falsework, accessible habitat elsewhere within the action area, NMFS expects adult and smolt salmonids will have sufficient space for migration/spawning and emigration activities. Thus, impacts of reduced habitat from trestles and falsework are not expected to significantly change the migration/spawning, and/or emigration behavior of these salmonid life stages.

2.5.7 Critical Habitat Effects

The action area is designated critical habitat for CCC steelhead, CCC coho salmon, and CC Chinook salmon. Generally speaking, PBFs of critical habitat for both steelhead and salmon found within the action area include sites for migration, spawning, and rearing (see section 2.4). Effects of the Project on designated critical habitat include temporary disturbance to the streambed, bank, and flow from dewatering; temporary disturbance to waterways from pile driving; temporary and permanent loss of riparian vegetation during construction access and staging; temporary elevated turbidity levels from suspended sediment; and loss of habitat from pile installation.

Regarding effects to critical habitat from project site dewatering, for the same reasons described above for juvenile salmonids, adverse effects to CCC steelhead, CCC coho salmon, and CC Chinook salmon critical habitat PBFs are expected to be temporary, insignificant, and will recover relatively quickly (one to two months) after the project site is re-watered. Similarly, for reasons described above for juvenile salmonids, short-term turbidity from elevated levels of suspended sediment may slightly degrade the value of critical habitat in the action area, but only temporarily. Based on the size of the area to be dewatered (250 linear feet) and stream and bank substrate conditions, NMFS expects turbidity after rewatering the project site to last for only a few hours. Turbidity and sediment deposited downstream resulting from this project are unlikely to significantly impact migration, spawning, or rearing PBFs in the action area. Similarly, for the same reasons described above for individual salmonids, adverse effects to CCC steelhead, CCC coho salmon, and CC Chinook salmon critical habitat will result in both temporary and permanent habitat loss; but the amount of habitat lost compared to available habitat in the surrounding area, and areas that will be restored onsite, are not expected to result in significant impacts to designated critical habitat.

As described above in Section 2.5.5.1 of this opinion, elevated SPLs within the action area are expected to create a zone of injury/mortality and behavior impacts. Fish within the area of accumulated SEL levels of 187 dB and above may be subject to injury or mortality as described above. For sound levels beyond the zone of injury/mortality, but greater than 150 dB RMS, a level of disturbance may cause exposed fish to avoid using the area for foraging and rearing during pile driving. As described above, only juvenile salmonids are expected to be present during actions resulting in elevated SPLs, and elevated SPLs do not persist beyond the source action (*i.e.,* will not persist beyond the period of active pile driving).

For juvenile salmonids, elevated SPLs could result in an adverse behavioral response during pile driving. Assuming a worst case scenario, the action area could be rendered unusable by juvenile salmonids during all impact pile driving operations. These actions could prevent juvenile salmonids from using portions of the action area for a maximum of 1.5 hours per day for approximately 36, non-consecutive, days (see Sections 1.3.4, 1.3.5 and 2.5.5.2) when impact pile driving operations are underway. During these periods juvenile salmonids may avoid foraging in portions of the action area where elevated SPLs are occurring. However, habitat of similar value is available downstream of the action area for any displaced individuals. Also, when the impact pile driving activities cease, the elevated underwater sound effects cease, making this area and its food resources again fully accessible to juvenile salmonids. Thus, this temporary impact is not anticipated to prevent juvenile salmonids from finding suitable forage at the quantities and quality necessary for normal behavior (*e.g.,* maintenance, growth, reproduction, etc.) and NMFS does not expect any lasting reduction in habitat value related to elevated underwater sound levels.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. NMFS does not anticipate any cumulative effects in the action area other than those from ongoing actions already described in the Environmental Baseline above.

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

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminishes the value of designated or proposed critical habitat for the conservation of the species.

CC Chinook salmon status remains as threatened (NMFS 2016) due to the continuing threats that face this species including poor ocean conditions, drought and reduced freshwater habitat quality. Throughout the ESU there has been a mix in the population trends, with some population abundance increasing and others decreasing (NMFS 2016). Overall, there is a lack of compelling evidence to suggest that the status of these populations has improved or deteriorated appreciably since the previous status review (Williams et al. 2011). The temporary and minor loss of Chinook salmon habitat along the West Fork Russian River is unlikely to reduce the overall abundance of the Chinook salmon population in the Russian River. Monitoring by the Sonoma County Water Agency from 2000-2013 has documented an average of approximately 3,000 adult Chinook salmon spawners annually, with the highest abundance estimate of 7,000 spawners seen in 2012 (NMFS 2016). These spawners utilize much of the mainstem Russian River and its larger tributaries for spawning and rearing. The reduction in habitat quality within the action area is expected to reduce spawning or rearing success of a small number of Russian River Chinook salmon. Given the current population abundance in the Russian River, the loss of a few individual juvenile fish is not expected to be sufficient to reduce the extinction risk of this population, and therefore, would not change the trajectory of this species at the ESU level.

The West Fork Russian River is part of the Upper Russian River "independent" population, and serves an essential role in the CCC steelhead recovery effort (NMFS 2016). As with Chinook, a small number of steelhead inhabiting the action area may experience a higher likelihood of perishing prior to reaching adulthood and spawning, primarily due to reduced fitness and growth brought on by project construction and loss of riparian habitat. However, the anticipated small loss of juvenile steelhead is unlikely to appreciably impact the future survival and recovery at the DPS scale since adequate quantities of habitat remain within the tributary reaches of the West Fork Russian River from which the lost production can be regained.

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

The proposed action will degrade PBFs and essential habitat types in the action area, namely those related to juvenile rearing. Yet, the effects of the proposed action, when added to the environmental baseline, cumulative effects, and species status, are not expected to appreciably reduce the quality and function of critical habitat at the larger CCC coho salmon, CC Chinook ESU or CCC steelhead DPS, given the small area being degraded compared to the quality and quantity of habitat within the Russian River watershed. Thus, the proposed action will not impair the ability of critical habitat to play its intended conservation role of supporting populations of CCC coho salmon, CC Chinook salmon, and CC steelhead at the ESU and DPS levels.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of CCC steelhead, nor destroy or adversely modify their designated critical habitat.

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of CC Chinook salmon, nor destroy or adversely modify their designated critical habitat.

After reviewing and analyzing the current status of the critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to destroy or adversely modify CCC coho salmon designated critical habitat.

2.9 Incidental Take Statement

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

2.9.1 Amount or Extent of Take

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

Take of listed juvenile CCC steelhead and CC Chinook salmon may occur during fish relocation and dewatering in a 250 linear foot reach at the project site between June 15 and October 1. The number of CCC steelhead that may be incidentally taken during dewatering activities is expected to be small, and limited to the pre-smolt and young-of-year juvenile life stage. NMFS expects that no more than 2 percent of juvenile steelhead within the 250 linear foot dewatering area of the West Fork Russian River will be injured, harmed, or killed during fish relocation activities. NMFS also expects that no more than 1 percent of the fish within the 250 linear foot dewatering area of the West Fork Russian River will be injured, harmed, or killed during dewatering activities. Because no more than 328 juvenile steelhead are expected to be present within the 250 linear foot dewatering reach, NMFS expects no more than 10 juvenile CCC steelhead will be harmed or killed by the project. If more than 328 juvenile steelhead are captured or more than 10 juvenile steelhead are harmed or killed, incidental take will have been exceeded.

Similarly, the number of CC Chinook salmon that may be incidentally taken during dewatering activities is expected to be low (as a result of migration since most juveniles will migrate to estuarine or marine environments by June 15 of each year), and will be limited to the pre-smolt/young-of-year juvenile life stage. Despite the lack of an estimate on the number of juvenile Chinook salmon that will be present within the dewatering area, NMFS expects that no more than 2 percent of the fish within the 250 linear foot dewatering area of the West Fork Russian River will be injured, harmed, or killed during fish relocation activities. Furthermore, NMFS expects that no more than 1 percent of the CC Chinook within the 250 linear foot dewatering area of the Russian River will be injured, harmed, or killed during dewatering activities. If more than 3 percent of the total number of juvenile CC Chinook salmon captured are harmed or killed, incidental take will have been exceeded.

Take of listed CCC steelhead and CC Chinook salmon may occur during impact pile driving activities necessary to construct falsework, trestles, and the new bridge structure. Insufficient data exists to estimate the specific number of CCC steelhead and CC Chinook salmon that may be injured or killed. However, based on available information, we believe very few CCC steelhead and CC Chinook salmon will be injured or kill. Monitoring or measuring the number of listed salmonids actually injured or killed by elevated sound levels during pile driving is also not feasible because injured or killed salmonids may not float to the surface or may be carried away by currents in and near the action area. Due to the difficulty in quantifying the number of CCC steelhead and CC Chinook salmon that could be affected by pile driving, a surrogate measure of take is necessary to establish a limit of take exempted by this incidental take statement. For this action, compliance with the expected elevated underwater sound levels during pile driving is the best surrogate measure for incidental take associated with project implementation. Therefore, NMFS will consider the extent of take exceeded if elevated sound levels during pile driving indicates that accumulated SPLs greater than those estimated in this biological opinion as likely to occur from pile driving actions (see Section 2.5.5). Specifically, take coverage for injury and mortality of CCC steelhead and CC Chinook salmon will assume to have been exceeded if:

- Impact pile driving of steel H-piles for trestles generates:
  - SPLs greater than or equal to 206 dB within an area greater than approximately 0.06 acres of the West Fork Russian River (approximated by a circle with a 33-foot-radius centered around each proposed pile); or

    - SPLs great than or equal to 187 dB within an area greater than approximately 0.21 acres of the West Fork Russian River (approximated by a circle with a 98-foot-radius centered around each proposed pile).

- Impact pile driving of steel pipes for falsework generates:
    - SPLs greater than or equal to 206 dB within an area greater than approximately 0.06 acres of the West Fork Russian River (approximated by a circle with a 33-foot-radius centered around each proposed pile); or
    - SPLs great than or equal to 187 dB within an area greater than approximately 0.39 acres of the West Fork Russian River (approximated by a circle with a 177-foot-radius centered around each proposed pile).
- Impact pile driving of H-piles for new bridge generates:
    - SPLs greater than or equal to 206 dB within an area greater than approximately 0.06 acres of the West Fork Russian River (approximated by a circle with a 33-foot-radius centered around each proposed pile); or
    - SPLs great than or equal to 187 dB within an area greater than approximately 0.21 acres of the West Fork Russian River (approximated by a circle with a 98-foot-radius centered around each proposed pile).

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 CC Chinook salmon or CCC steelhead, or destruction or adversely modify the critical habitat designated for CCC coho salmon, CC Chinook salmon, or CCC steelhead.

2.9.3 Reasonable and Prudent Measures

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

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

1. undertake measures to ensure that injury and mortality to salmonids resulting from fish relocation and dewatering activities is low;
2. undertake measures to minimize harm to salmonids from construction of the project and degradation of aquatic habitat;
3. undertake measures to ensure that injury and mortality of juvenile salmonids resulting from pile driving activities is low; and
4. prepare and submit plans and reports regarding the effects of fish relocation, construction of the project, post-construction site performance, and results of the hydroacoustic monitoring.

2.9.4 Terms and Conditions

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

1. The following terms and conditions implement reasonable and prudent measure 1:
   a. The Caltrans shall retain a qualified biologist with expertise in the areas of anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. The applicant shall ensure that all fisheries biologists working on this project be qualified to conduct fish collections in a manner which minimizes all potential risks to ESA-listed salmonids. Electrofishing, if used, shall be performed by a qualified biologist and conducted according to the *NOAA Fisheries Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act*, *June 2000.* See: http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf.
   b. The fisheries biologist shall monitor the construction site during placement and removal of cofferdams, and channel diversions, to ensure that any adverse effects to salmonids are minimized. The biologist shall be on site during all dewatering events in anadromous fish streams to ensure that all ESA-listed salmonids are captured, handled, and relocated safely. Caltrans or the fisheries biologist shall notify NMFS Fish Biologist at (707) 575-6068 or elena.meza@noaa.gov, one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities. During fish relocation activities the fisheries biologist shall contact NMFS staff at the above number, if mortality of federally listed salmonids exceeds 3 percent of the total for each species collected, at which time NMFS will stipulate measures to reduce the take of salmonids.
   c. If ESA-listed fish are handled, it shall be with extreme care and they shall be kept in water to the maximum extent possible during rescue activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream and fish shall not be removed from this water except when released. To avoid predation the biologist shall have at least two containers and segregate young-of-year salmonids from larger age-classes and other potential aquatic predators. Captured salmonids will be relocated as soon as possible to a suitable instream location (pre-approved by NMFS) where suitable habitat conditions are present to allow for survival of transported fish and fish already present.
   d. Non-native fish that are captured during fish relocation activities shall not be relocated to anadromous streams, or areas where they could access anadromous habitat.

2. The following terms and conditions implement reasonable and prudent measure 2:
    a. To ensure that dry season low-flow conditions continue within the action area, Caltrans shall contact NMFS Fish Biologist at (707) 575-6068 or elena.meza@noaa.gov each construction year beginning on September 15, to provide a 7-day forecast relevant to the action area. Additionally, this notification shall:
        i. Be provided on a weekly basis;
        ii. Be used by NMFS to determine that conditions remain suitable for construction;
        iii. Include a short description on remaining work to be completed, and an estimate of the number of days needed to complete remaining work.
    b. Caltrans will allow any NMFS employee(s) or any other person(s) designated by NMFS to accompany field personnel to visit the project site during activities described in this opinion.
    c. To ensure that the project is built as designed and contractors adhere to construction best management practices, monitoring will be performed during construction by skilled individuals. Monitors will be knowledgeable in the project designs, construction minimization measures, and the needs of native fish, including steelhead and Chinook salmon. Monitoring will be performed daily. The monitor(s) will work in close coordination with project management personnel, the project design (engineering) team, and the construction crew to ensure that the project is built as designed.
    d. Any pumps used to divert live stream flow will be screened and maintained throughout the construction period to comply with NMFS' Fish Screening Criteria for Anadromous Salmonids (2000).
    e. Construction equipment used within the river channel will be checked each day prior to work within the river channel (top of bank to top of bank) and, if necessary, action will be taken to prevent fluid leaks. If leaks occur during work in the channel, Caltrans or their contractors will contain the spill and removed the affected soils.
    f. Once construction is completed, all project-introduced material must be removed, leaving the river as it was before construction. Excess materials will be disposed of at an appropriate disposal site.
3. The following terms and conditions implement reasonable and prudent measure 3:
    a. Monitor underwater sound levels during impact pile driving to evaluate effects of the project on juvenile CCC steelhead and CC Chinook.
        i. At least four weeks prior to the initiation of construction, Caltrans shall develop and submit to NMFS for review a hydroacoustic monitoring plan that includes underwater sound measurements at various distance and depths from impact pile driving operations. At minimum, the plan must include the following: 1) all hydrophones will be placed at least 1 meter

(3.3 feet) below the surface; 2) if only one hydrophone is used, it will be placed 10 meters (33 feet) from the pile at midwater depth; 3) if more than one hydrophone is used to calculate transmission loss over distance, water depth where the hydrophone will be located will be at least 3 meters (13 feet); and 4) if waters are less than 4 meters (13 feet) deep, a single hydrophone will be placed at midwater depth.

ii. A designated monitor shall be on-site daily while impact pile driving is taking place to ensure that the attenuation mechanism (to be determined by the contractor) is operating efficiently. Caltrans shall be prepared to maintain and repair whatever attenuation mechanism that is implemented if the system is not functioning properly and fully.

iii. No impact pile driving will occur at times when the attenuation mechanism is not functioning properly and fully.

iv. The following acoustic metrics shall be recorded at a distance of 10 meters: single strike, single strike SEL, and RMS. Post-analysis and calculation shall be determined as described in Underwater Noise Monitoring Template developed by the FHWG. If measured SPLs exceed the SPLs at the distances identified in Section 2.5.5.1 of this biological opinion, Caltrans shall take immediate action to reduce the level of effect and shall notify NMFS within 24 hours (contact Elena Meza at elena.meza@noaa.gov).

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

4. The following terms and conditions implement reasonable and prudent measure 4:

   a. **Project Construction and Fish Relocation Report** – Caltrans must provide a written report to NMFS by January 15 of the year following construction (2023). The report must be submitted to NMFS' North-Central Coast Office, Attention: Central Coast Branch Chief, 777 Sonoma Avenue, Room 325, Santa Rosa, California, 95404-6528. The report must contain, at minimum, the following information:

      i. **Construction related activities** – The report(s) must include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, including a description of any and all measures taken to minimize those unanticipated effects and a statement as to whether or not the unanticipated effects had any effect on ESA-listed fish; the number of salmonids killed or injured during the project action; and photographs taken before, during , and after the activity from photo reference points.

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

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

i. **Post-Construction Vegetation Monitoring and Reporting** – Caltrans must develop and submit for NMFS' review, a plan to assess the success of the revegetation of the site. A draft of the revegetation monitoring plan must be submitted to NMFS (address specified in 3a above) for review and approval three months prior to the beginning of project construction (i.e., must be submitted March 15, 2022, which is three months before the proposed June 15, 2022 start date). Reports documenting post-project conditions of vegetation installed at the site will be prepared and submitted annually for the first five years following project completion, unless the site is documented to be performing poorly, then monitoring requirements will be extended. Reports will document vegetation health and survivorship and percent cover, natural recruitment of native vegetation (if any), and any maintenance or replanting needs. Photographs must be included. If poor establishment is documented, the report must include recommendations to address the source of the performance problems.

c. **Hydroacoustic Monitoring Report** – Caltrans shall provide a written report to NMFS within 120 days of completion of each pile driving event (i.e. trestles/falsework and new bridge construction) necessary to complete the project. The report shall be submitted to NMFS North Central Coast Office, Attention: Central Coast Branch Supervisor, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404-6528. The report must contain, at minimum, the following information:

i. Project related activities – the dates pile installation occurred and a description of any and all measures taken to minimize effects on juvenile CCC steelhead and CC Chinook salmon (*e.g.,* utilization of sound attenuation mechanism);

ii. Attenuation mechanism monitoring – a description of the methods used to monitor the functioning of the attenuation mechanism; a description of any events during which the attenuation mechanism was not functioning properly and fully; and a description of methods used to maintain or repair the attenuation mechanism, if undertaken; and

iii. Hydroacoustic monitoring – a description of the methods used to monitor underwater sound levels during impact hammer use; the locations (depths and distance from point of impact) where monitoring was conducted; the total number of pile strikes per pile; total number of strikes per day; interval between strikes; the peak/SPL, RMS, and SEL per strike; and accumulated SEL per day.

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 at this time.

2.11 Reinitiation of Consultation

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

2.12 "Not Likely to Adversely Affect"' Determinations

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

NMFS does not anticipate that the proposed action will adversely affect:

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

CCC coho in the Russian River are nearly extirpated (NMFS 2012). Juvenile coho are reared at the Don Clausen Fish Hatchery at the Warm Springs Dam, and while releases do occur within the Sonoma County portion of the Russian River watershed, juveniles are not released within the Mendocino County portion of the watershed. Coho salmon distribution is believed to be restricted to the lower third of the Russian River watershed, approximately 40 linear miles south of the proposed project location. Due to this restricted distribution, CCC coho are unlikely to be present in the action area during the project; therefore, the effects of the project's activities are anticipated to be discountable.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

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

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

3.1 Essential Fish Habitat Affected by the Project

Pacific coast salmon EFH may be adversely affected by the proposed action. Specific habitats identified in the PFMC (2014) for pacific coast salmon include habitat areas of particular concern (HAPCs), identified as: 1) complex channels and floodplain habitats; 2) thermal refugia; and 3) spawning habitat. HAPCs for Chinook salmon include all waters, substrates, and associated biological communities falling within critical habitat areas described above in the accompanying biological opinion for the project located on the West Fork Russian River. Essentially, all CC Chinook salmon and CCC coho salmon habitat located within the proposed action is considered HAPC as defined in PFMC (2014).

3.2 Adverse Effects on Essential Fish Habitat

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

3.3 Essential Fish Habitat Conservation Recommendations

Section 305(b)(4)(A) of the MSA authorizes NMFS to provide EFH Conservation Recommendations that will minimize adverse effects of an activity on EFH. Although temporary potential adverse effects are anticipated as a result of the project activities, the proposed minimization and avoidance measures, and best management practices in the accompanying biological opinion are sufficient to avoid, minimize, and/or mitigate for the anticipated affects.

Therefore, no additional EFH Conservation Recommendations are necessary at this time that would otherwise offset the adverse effects to EFH.

3.4 Supplemental Consultation

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

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion is the California Department of Transportation (Caltrans) and individual copies of this opinion were provided to Caltrans. The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

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

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

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

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

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