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 29, 2019 **Refer to NMFS No:** WCR-2019-00401

Steve Croteau
Branch Chief, Environmental Services E2
California Department of Transportation
1656 Union Street
Eureka, California 95501

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the South Fork Eel River Bridge Seismic Retrofit Project in Humboldt County, California (EA 01-0A110)

Dear Mr. Croteau:

Thank you for your letter of April 18, 2019, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the South Fork Eel River Bridge Seismic Retrofit Project.

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 the description of the action proposed by the California Department of Transportation (Caltrans[1]), and describes NMFS' analysis of potential effects on threatened Northern California (NC) steelhead (*Oncorhynchus mykiss*), and their designated critical habitat as well as critical habitat for Southern Oregon/Northern California Coast (SONCC) coho salmon (*O. kisutch*) and the California Coastal (CC) Chinook salmon (*O. tshawytscha*), in accordance with section 7 of the ESA. Based on the best scientific and commercial information available, NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of NC steelhead or destroy, or adversely modify designated critical habitat for NC steelhead, SONCC coho salmon or CC Chinook salmon. NMFS expects that the proposed action may result in incidental take of NC steelhead. An incidental take statement is included with the enclosed biological opinion. The incidental take

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

statement includes non-discretionary reasonable and prudent measures and terms and conditions that are expected to further reduce anticipated incidental take.

The enclosed EFH consultation was prepared pursuant to section 305(b) of the MSA. The proposed action includes areas identified as EFH for coho salmon and Chinook salmon, Pacific salmon species managed under the Pacific Coast Salmon Fishery Management Plan. Based on our analysis, NMFS concludes that the project would adversely affect EFH for coho salmon and Chinook salmon. Therefore, NMFS provides a conservation recommendation in Section 3 of this document.

Please contact Mike Kelly, Northern California Office, Arcata, at (707) 825-1622 or via email at Mike.Kelly@noaa.gov if you have any questions concerning this section 7 consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: ARN File #151422WCR2019AR00091
PCTS #WCR-2019-00401

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

Fernbridge Emergency Opening Project on the Lower Eel River in Humboldt County, California

NMFS Consultation Number: *WCRO-2019-00401*
Action Agency: California Department of Transportation, District 1

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 Destroy or Adversely Modify Critical Habitat?
Southern Oregon/North California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*)	Threatened	No	No	No
California Coastal (CC) Chinook salmon (*O. tshawytscha*)	Threatened	No	No	No
Northern California (NC) Steelhead (*O. mykiss*)	Threatened	Yes	No	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	Yes

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: August 29, 2019

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1 INTRODUCTION

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

1.1 Background

NOAA's National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402. 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). A complete record of this consultation is on file at the NMFS Northern California Office in Arcata, California.

1.2 Consultation History

California Department of Transportation (Caltrans) staff (Jeff Wright, Jason Frederickson, and Frank Cullinan) presented a preliminary overview of the project at a Level 1 meeting on April 18, 2018. NMFS staff (Mike Kelly) made an initial site visit on January 10, 2019, and a follow-up visit on April 4, 2019. During the initial visit, NMFS provided recommendations about the water diversion and possible relocation of juvenile steelhead. During the second visit, NMFS staff provided recommendations about the extent of rock slope protection (RSP).

After continued technical assistance and NMFS' review of a draft Biological Assessment (BA), Caltrans determined that the Project may adversely affect Northern California (NC) steelhead, and its designated critical habitat as well as designated critical habitat for Southern Oregon/Northern California Coast (SONCC) coho salmon, California Coast (CC) Chinook salmon. On April 18, 2019, Caltrans submitted a final BA (Caltrans 2019a) and requests for initiation of an ESA formal consultation and an MSA EFH consultation. NMFS determined there was sufficient information provided to initiate formal consultation on April 18, 2019.

Caltrans subsequently notified NMFS on June 24, 2019, that a project change would require a new hydroacoustic analysis. This new information was necessary to continue the consultation, so NMFS and Caltrans mutually agreed to suspend the consultation while Caltrans developed the new information. Caltrans provided the new hydroacoustic analysis to NMFS on July 16, 2019 (Caltrans 2019b). However, at that time Caltrans also notified NMFS that a new rock slope protection (RSP) design, which was based on our previous recommendation, was forthcoming. So NMFS and Caltrans mutually agreed to continue with suspension of the consultation schedule. Caltrans provided a draft layout of the new RSP design to NMFS on July 24, 2019 and NMFS determined that the new information was sufficient to restart the consultation. Caltrans then provided a written addendum to the BA with a summary of project changes and final RSP plans on August 15, 2019.

1.3 Federal Action

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

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). NMFS and Caltrans identified no interrelated or interdependent actions related to this emergency action.

Caltrans with funding from the Federal Highway Administration proposes to seismically retrofit the South Fork Eel Bridge on U.S. Highway 101 near the town of Myer's Flat in Humboldt County, California. The project includes ground disturbance and vegetation clearing, construction of an access road, stream diversion and fish relocation. Construction activities are anticipated to start by January 3, 2022. Completion is anticipated by October 1, 2024. However, the project may begin in a different year depending on the remainder of the project delivery process. The project is estimated to take 153, 8-hour working days. All work below the ordinary high water mark (OHWM) would be restricted to June 15 through October 15.

This proposed action would involve:

- Installation of shear studs over the full length of the bridge.
- Installation of bearing web stiffeners on the superstructure girders.
- Construction of catcher blocks and concrete jackets at the piers.
- Construction of catcher bents with cast-in-drilled-hole (CIDH) piles at both abutments.
- Repair of a broken culvert and associated erosion at Abutment 1.
- Construction of RSP with filter fabric at Pier 3 and Pier 4.
- Construction of RSP with filter fabric on the bank below Abutment 5.
- Installation of a new stormwater drain pipe at Abutment 5.
- Application of polyester polymer concrete on the bridge deck.
- Construction of access roads and work trestles on the riverbed.
- Construction of a clear water diversion and relocation of aquatic species.
- Construction of cofferdams on riverbed at each pier.
- Clearing of trees and vegetation for construction access.
- Installation of various erosion control and containment measures and site revegetation.

The following sections describe project elements with the potential to affect ESA-listed salmonids and their designated critical habitats.

1.3.1 Shear Stud Installation

Shear studs (a stud that transfers shear stress between metal and concrete) would be placed above each girder of the bridge. For each stud, a 12-inch by 12-inch square would be removed using a hydraulic ram (hoe ram) to the full depth of the concrete deck. After the shear stud is placed, the cut-out portion of the deck would be filled with concrete and restriped. All material will be contained on the bridge deck. No hydroacoustic impacts are anticipated due to hoe ram work because sufficient sound energy is not expected to transfer from the deck to the water below (Caltrans 2019b).

1.3.2 Catcher Bent Construction

Catcher bents would be constructed near both abutments with large diameter CIDH piles. This type of pile does not produce potentially harmful sound impulses during installation. Catcher bents will be constructed above the OHWM. Some excavation would be done and temporary earth retaining structures (e.g., sheet piles or concrete blocks or rails) may be needed for the construction of catcher bents. Sheet piles would be installed and removed with a vibratory hammer, so hydroacoustic impacts would not affect fish or their habitat.

1.3.3 Pier Catcher Block, Jacket and RSP Construction

Concrete jackets and catcher blocks would be formed and poured onto the existing pier footings. Approximately 765 cubic yards [49 feet by 97 feet (0.079 acre)] of streambed material would be excavated from around the base of Pier 3 to a depth of approximately six feet. Approximately 765 cubic yards [49 feet by 97 feet (0.079 acre)] of streambed material would be removed at Pier 4. Excavation depths around the base of Pier 4 would be approximately 6 feet. RSP volumes will be equal to the volume of excavated material, so RSP will be flush with the existing gravel surface at both locations. Additionally, approximately 1,763 cubic yards [118 feet by 115 feet (0.265 acre)] of RSP would be placed on the slope from below the OHWM up to Abutment 5.

1.3.4 Access Roads

The roads will be approximately 20 feet wide, but may vary at some locations to allow for equipment turnarounds, equipment passing, and work areas. Depending on access road conditions and locations, the roads may need to be overlain with gravel pads (typically made of 2- to 3-inch diameter open-graded or washed aggregate—stone or crushed concrete) or fills. Road fill would be placed on top of geotextile fabric to keep fines and crushed rock separate from natural riverbed material. Some light grading may be needed to construct the roads.

1.3.5 Work Trestles

Trestles would be installed prior to any pier foundation or scour remediation work. They are anticipated to be approximately 20 to 30 feet wide and could have multiple extensions. The trestles would likely be located along the access roads. Small diameter piles (≤ 24-inches) would be driven into the gravel bars immediately adjacent to the river, and approximately 20 to 30 piles would be driven in water. Rows of piles would likely be spaced every 30 feet along the length of the trestle, and 8 feet apart within rows.

1.3.6 Cofferdams

Within the wetted channel, cofferdam sheet piles would be installed with a vibratory hammer. Water would then be pumped out of the cofferdam. Since the cofferdam might experience groundwater intrusion, continuous pumping may be necessary. In this scenario, water would likely be pumped into a sediment basin or tank. Cofferdams may also be constructed at bent

locations on land if water intrusion is anticipated. Water generated from the dewatering operations from cofferdams would be disposed of per the Caltrans Field Guide to Dewatering (Caltrans 2014) and the project-specific Construction Site Dewatering/Diversion Plan. Cofferdams will be removed with a vibratory hammer/extractor after construction.

1.3.7 River Diversion and Fish Relocation

A temporary water diversion would be necessary for work on the bridge foundation and cofferdams. The length of the diversion will depend on conditions at the time of construction. Materials typically consist of culverts placed between dams made of gravel bags and plastic sheeting. The contractor will be required to prepare and submit the Construction Site Dewatering/Diversion Plan to Caltrans prior to any dewatering.

The river diversion will also require relocation of any fish within the footprint of the diversion. Additionally, fish may be relocated and excluded from the area of potential injurious sound levels due to pile driving, which is expected to extend well beyond the diversion footprint. Alternatively, Caltrans my elect to monitor sound levels and discontinue pile driving before reaching injurious accumulated sound levels. This option will also be described in the NMFS-approved Dewatering/Diversion Plan and the Hydroacoustic Monitoring Plan.

1.3.8 Vegetation Clearing

Construction of the access roads and placement of RSP will require removal of approximately 0.4 acre of willows, poison oak, horsetail, and sapling cottonwoods. Where possible, native vegetation will be replanted at the end of construction.

1.3.9 Interrelated and Interdependent Actions

“Interrelated actions” are those that are part of a larger action and depend on the larger action for their justification. “Interdependent actions” are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Because the proposed action is intended to maintain the normal use of the bridge, and will not increase traffic or change traffic patterns, Caltrans and NMFS do not expect any interrelated or interdependent actions as a result of the proposed action.

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 incidental take statement (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.

Caltrans determined the proposed action is not likely to adversely affect SONCC coho salmon

and CC Chinook salmon individuals. Our concurrence is documented in the "Not Likely to Adversely Affect" Determinations in Section 2.12.

2.1 Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "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 for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (81 FR 7214).

The designation of critical habitat uses the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace 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.

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

- Identify the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an "exposure-response-risk" approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) Reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.
- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- 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 NC steelhead, which is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species faces, 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 for SONCC coho salmon, CC Chinook salmon, and NC steelhead 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 General Life History

NC Steelhead exhibit the most complex suite of life history strategies of any salmonid species. They have both anadromous and resident freshwater life histories that can be expressed by individuals in the same watershed. The anadromous fish generally return to freshwater to spawn as 4 or 5 year old adults. Unlike other Pacific salmon, steelhead can survive spawning and return to the ocean only to return to spawn in a future year. It is rare for steelhead to survive more than two spawning cycles. Steelhead typically spawn between December and May. Like other Pacific salmon, the steelhead female deposits her eggs in a redd for incubation. The 0+ age fish emerge from the gravel to begin their freshwater life stage and can rear in their natal stream for 1 to 4 years before migrating to the ocean.

Steelhead have a similar life history as noted above for coho salmon, in the sense that they rear in freshwater for an extended period before migrating to saltwater. As such, they enter the estuary as larger fish (mean size of about 170 to 180 mm or 6.5 to 7.0 inches) and are, therefore, more oriented to deeper water channels in contrast to Chinook salmon that typically enter the estuary as 0+ fish. The CDFW data indicate that steelhead smolts generally migrate downstream toward the estuary between March 1 and July 1 each year, although they have been observed as late as September (Ricker et al. 2014). The peak of the outmigration timing varies from year to year within this range, and generally falls between early April and mid-May.

2.2.2 Status of Species and Critical Habitat

In this biological opinion, NMFS assesses four population viability parameters to help us understand the status of the species and its ability to survive and recover. These population viability parameters are: abundance, population productivity, spatial structure, and diversity (McElhaney et al. 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information, including the Recovery Plan for SONCC Coho Salmon (NMFS 2014) and Coastal Multispecies Recovery Plan (NMFS 2016), to determine the general condition of each population and factors responsible for the current status of each Distinct Population Segment (DPS) or Evolutionarily Significant Unit (ESU). We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20).

2.2.2.1 Status of NC Steelhead

NC Steelhead Abundance and Productivity: With few exceptions, NC steelhead are present wherever streams are accessible to anadromous fish and have sufficient flows. The most recent status review by Williams et al. (2016) reports that available information for winter-run and summer-run populations of NC steelhead do not suggest an appreciable increase or decrease in extinction risk since publication of the last viability assessment (Williams et al. 2011). Williams et al. (2016) found that population abundance was very low relative to historical estimates, and

recent trends are downwards in most stocks.

NC Steelhead Spatial Structure and Diversity: NC steelhead remain broadly distributed throughout their range, with the exception of habitat upstream of dams on both the Mad River and Eel River, which has reduced the extent of available habitat. Extant summer-run steelhead populations exist in Redwood Creek and the Mad, Eel (Middle Fork) and Mattole Rivers. The abundance of summer-run steelhead was considered "very low" in 1996 (Good et al. 2005), indicating that an important component of life history diversity in this DPS is at risk. Hatchery practices in this DPS have exposed the wild population to genetic introgression and the potential for deleterious interactions between native stock and introduced steelhead. However, abundance and productivity in this DPS are of most concern, relative to NC steelhead spatial structure and diversity (Williams et al. 2011).

2.2.2.2 Status of Critical Habitats

The condition of SONCC coho salmon, CC Chinook salmon, and NC steelhead critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the following human induced factors affecting critical habitat: overfishing, artificial propagation, 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). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESU's and DPS. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

2.2.3 Factors Responsible for the Decline of Species and Degradation of Critical Habitat

The factors that caused declines of species and degradation of critical habitat include hatchery practices, ocean conditions, habitat loss due to dam building, degradation of freshwater habitats due to a variety of agricultural and forestry practices, water diversions, urbanization, over-fishing, mining, climate change, and severe flood events exacerbated by land use practices (Good et al. 2005, Williams et al. 2016). Sedimentation and loss of spawning gravels associated with poor forestry practices and road building are particularly chronic problems that can reduce the productivity of salmonid populations. Late 1980s and early 1990s droughts and unfavorable ocean conditions were identified as further likely causes of decreased abundance (Good et al. 2005). From 2014 through 2016, the drought in California reduced stream flows and increased temperatures, further exacerbating stress and disease. Ocean conditions have been unfavorable in recent years (2014 to present) due to the El Nino in 2015 and 2016. Reduced flows can cause increases in water temperature, resulting in increased heat stress to fish and thermal barriers to migration.

One factor affecting the range wide status and aquatic habitat at large is climate change. Information since these species were listed suggests that the earth's climate is warming, and that this change could significantly impact ocean and freshwater habitat conditions, which affect survival of species subject to this consultation. Steelhead are particularly vulnerable to climate

change due to their need for year-round cool water temperatures (Moyle 2002). Through effects on air temperatures and stream flows, climate change is expected to increase water temperatures to the detriment of salmonids. Climate change effects on stream temperatures within Northern California are already apparent. For example, in the Klamath River, Bartholow (2005) observed a 0.5°C per decade increase in water temperature since the early 1960's, and model simulations predict a further increase of 1-2°C over the next 50 years (Perry et al. 2011).

In coastal and estuarine ecosystems, the threats from climate change largely come in the form of sea level rise and the loss of coastal wetlands. Sea levels will likely rise exponentially over the next 100 years, with possibly a 50-80 cm rise by the end of the 21st century (IPCC 2007). This rise in sea level will alter the habitat in estuaries and either provides an increased opportunity for feeding and growth or in some cases will lead to the loss of estuarine habitat and a decreased potential for estuarine rearing. Marine ecosystems face an entirely unique set of stressors related to global climate change, all of which may have deleterious impacts on growth and survival while at sea. In general, the effects of changing climate on marine ecosystems are not well understood given the high degree of complexity and the overlapping climatic shifts that are already in place (e.g., El Niño, La Niña, Pacific Decadal Oscillation) and will interact with global climate changes in unknown and unpredictable ways. Overall, climate change is believed to represent a growing threat, and will challenge the resilience of listed salmonids in Northern California.

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the project encompasses the entire construction footprint that would be subject to ground disturbance and vegetation clearing, including the US 101 roadway and shoulders from Post Mile 27.71 to Post Mile 27.92, the two culverts slated for replacement (one culvert located below each bridge abutment), and the staging areas in the town/community of Myers Flat. The action area also includes that portion of the South Fork Eel River near the bridge that could be exposed to localized turbidity stemming from ground disturbance, and the extent of potential underwater noise transmittal that could result in behavioral effects to fish. Caltrans' estimates that turbidity may extend 600 feet downstream of the bridge, and underwater sound levels that could elicit behavioral changes in salmonids may extend in a 251 meter radius from piles driven in water for the work trestles (Caltrans 2019b).

2.4 Environmental Baseline

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 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

In the action area, the threat to SONCC coho salmon, CC Chinook salmon, and NC steelhead from climate change is likely to include a continued increase in average summer air temperatures; more extreme heat waves; and an increased frequency of drought (Lindley et al. 2007). In future years and decades, many of these changes are likely to further degrade habitat throughout the watershed by, for example, reducing streamflow during the summer and raising summer water temperatures. Many of these impacts will likely occur in the action area via higher

water temperatures and reduced flows in both the tributaries and mainstem of the Eel River.

High water temperatures greatly limit the quality and quantity of suitable summer rearing habitat, and the action area is predominantly a migratory corridor for adult and smolt life stages, as well as rearing habitat for juvenile life stages during the wet season. Older age classes of steelhead can be found in cooler microhabitats throughout the summer, generally near riffles. The composition of the substrate in the action area is primarily cobble, gravel, and associated fines (silt/clay particles). The watershed consists of soils that are prone to erosion. Riparian vegetation capable of providing shade to the South Fork Eel River is generally limited to one side of the river, with open gravel bars typically on the opposite side. Additionally, the active river channel 400 to 500 feet wide, so riparian trees have minimal impact on water temperatures in the action area.

2.4.1 Status of Listed Species and Critical Habitat in the Action Area

Steelhead in the action area belong to the South Fork Eel River population of NC steelhead, which NMFS Coastal Multispecies Recovery Plan suggests is likely well below the number needed to be at a low risk of extinction (NMFS 2016). A recent estimate of the number of redds produced by pairs of spawning steelhead in 2013 indicate an estimated 1,113 NC steelhead redds (Ricker et al. 2015). It should be noted that the data likely represent an underestimate given the timing and distribution of the survey effort being geared towards coho salmon.

The condition of SONCC coho salmon, CC Chinook salmon and NC steelhead critical habitat, specifically its ability to provide for their conservation, is degraded from conditions known to support viable populations. The South Fork Eel River consistently remains in the stressful to lethal range for salmonids during the summer (Kubicek 1977, NMFS 2014). The action area does not include deep pool habitat that would provide thermal stratification, nor is there cool tributary inflow into the action area. Springs or seeps below the low-flow waterline may provide a limited number of cool water microhabitats during this time period; however, no such cooler areas were detected by snorkelers or temperature probes during the summers of 2017 and 2018 (Caltrans 2019a). Water flowing interstitially through gravel deposits provides the greatest amount of cool water inflow during the summer months. Juvenile steelhead may be found near these cool inputs. Shade and micro-climate effects provided by overhanging vegetation can reduce water temperatures; however, during the low flow summer months these conditions are limited in the action area.

The highest threats to SONCC coho salmon, CC Chinook salmon, and NC steelhead in the South Fork Eel River are water diversions and impoundments, largely due to the cannabis industry and rural land use (NMFS 2014, 2016). Reduced flows have contributed to a reduction in the value of critical habitat in the action area.

2.4.2 Previous Section 7 Consultations in the Action Area

There are no known previous section 7 consultations for ESA-listed salmonids in the action area.

2.5 Effects of the Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but

still are reasonably certain to occur.

2.5.1 Turbidity and Contaminants

Research has shown that length of exposure to total suspended solids (TSS) plays a more dominant role than TSS concentration (Anderson et al. 1996). Long term exposure to elevated TSS conditions may cause an endocrine stress response (elevated plasma cortisol, glucose, and hematocrits), suggesting an increased physiological burden that could influence growth, fecundity, and longevity (Redding et al. 1987). Therefore, when considering the effects of TSS on listed fish, it is important to consider the frequency and the duration of the exposure, not just the TSS concentration (Newcombe and Jensen 1996).

Brief periods of turbidity are possible during placement and removal of the water diversion and cofferdams in both years of the project. Additionally, ground disturbed by the project will be stabilized to the extent practicable, but some discharge of sediment is possible during the first rains of the winter season.

During project activities, clean materials would be used to divert the water, and water would be prevented from contacting any disturbed soil. Caltrans estimates that visible turbidity may extended as far as 600-feet downstream for a "brief" period. NMFS estimates that each turbidity pulse would persist for no more than 30 minutes. Additionally, a turbidity pulse is unlikely to occupy the full channel width at high concentration, so any juvenile steelhead downstream may be able to avoid prolonged exposure. Therefore, NMFS believes that minor and incidental turbidity discharges during project activities will not result in a decrease in fitness or survival of individual juvenile steelhead, so any effects would be insignificant.

Post-project sediment discharges during rainfall will be minimized by application of measures described in Caltrans' BA (Caltrans 2019a), which are based on Caltrans' Storm Water Quality Handbook (Caltrans 2011), and have proven effective during past projects. NMFS believes that any discharges after the project is completed in a given year will be from superficial sources, so will not result in prolonged or high intensity discharges. Additionally, the adult and larger juvenile salmonids that may be present appear to be little impacted by the high concentrations of suspended sediments that occur during winter storm runoff episodes (Bjornn and Reiser 1991). Therefore, any impacts due to exposure to brief post-project elevated turbidity will be insignificant.

Potential discharge of contaminants from heavy equipment, concrete work and bridge deck treatment will be managed in accordance with the proposed minimization measures. Caltrans' measures have proven effective, so harmful discharges are extremely unlikely and therefore discountable.

2.5.2 Fish Relocation and Stream Diversion

Up to 300 linear feet of the South Fork Eel River would be dewatered by diverting the stream flow through culverts during the work window for up to two construction seasons. The diversion would be installed on or after June 15 and be removed prior to October 15. This measure avoids the late fall-winter migration period for adult salmon that pass through the project area, and the spring smolt out-migration. The diversion would, however, be constructed and remain in place during the period when juvenile steelhead may utilize the waters for summer rearing. Stream diversion and dewatering will require fish capture and relocation.

Additionally, up to approximately 310 feet of the South Fork Eel River would be within the zone of potential accumulated injurious sound levels (Caltrans 2019b). Depending on the location of an individual pile, Caltrans may remove fish and screen some portion of this length during pile driving beyond the dewatered reach. Alternatively, Caltrans may choose to monitor sound levels and stop pile driving (for a minimum of 12 hours) before reaching injurious levels. The following analyses account for the maximum distance of fish removal and any screening that may occur.

Fish Relocation

While fish relocation substantially avoids impacts from construction, fish relocation activities themselves can injure or even kill fish. The amount of unintentional injury or mortality attributable to fish removal varies widely depending on the method used, ambient conditions, and the expertise and experience of the field crew. Fish collecting gear, whether passive or active poses some risk to individuals, including stress, disease transmission, injury, or death (Hayes et al. 1996). In addition, relocated fish may have to compete with other fish for available resources such as food and habitat, and the growth rate of fish can be slowed when population density is high (Ward et al. 2007).

Based on the results of Caltrans' summer snorkel surveys in 2017 and 2018, as well as consideration of the quality of habitat both upstream and downstream of the pile driving location (see Environmental Baseline section), NMFS expects that no more than 12 juvenile steelhead would be captured and distributed to suitable habitat elsewhere in the South Fork Eel River during each year of the project. The expected number of relocated juvenile steelhead, relative to available habitat, would not be expected to substantially add to overcrowding or increased competition to a level that would decrease their overall survival.

Mortality of Fish Relocated

Data on fish relocation efforts from water diversion activities since 2004 shows most average mortality rates are below three percent for salmonids. Given the measures that would be implemented to avoid and minimize impacts to fish during relocation efforts, NMFS expects no more than three percent of all relocated fish would be subject to potential injury or mortality. Applying the maximum mortality rate (3%) to the total number of juvenile salmonids that may be captured and relocated indicates that no more than one juvenile NC steelhead would be injured or killed.

Stream Diversion

Adult salmonid migration and spawning, and smolt migration, are not likely to be affected because the diversion would be constructed after smolts have completed emigration, and then removed prior to the onset of adult spawning migration. Upstream passage of redistributing juveniles may be limited by the diversion; however, the proposed work windows minimize exposure and avoids peak timing of juvenile redistribution. Therefore, NMFS does not expect presence of the stream diversion to affect the fitness of any individuals, or to negatively influence any life stages of NC steelhead.

2.5.4 Pile Driving

Caltrans (2019b) evaluated potential underwater noise levels generated by planned construction activities and determined that impact pile installation could exceed currently adopted

hydroacoustic noise thresholds known to cause barotrauma injury to fish. Single strike noise levels that are known to cause injury to fish (>206 dB) are not expected. Therefore, listed salmonids would not be exposed to single strike injurious noise levels.

However, cumulative sound energy levels (cSEL) above 150 dB can also cause barotrauma in exposed fish. Because NMFS and Caltrans expect juvenile salmonids in the action area to weigh more than 2 grams, a cSEL exposure threshold of 187 dB is proposed, which results in an in-river distance of 310 feet within which injury could occur. As described in the previous section, fish may be relocated, or Caltrans will monitor noise levels and cease before injurious levels are reached. Therefore, injuries to salmonids due to barotrauma are discountable.

Additionally, behavioral impacts to fish may occur at levels above 150dB without reaching the injurious cSEL threshold up to approximately 251 meters from a pile as it is being driven. Temporary behavioral changes that fish may exhibit in response to pile driving noise include startling, altering behavioral displays, avoidance, displacement, and reduced feeding success. Observations of juvenile steelhead exposed to pile driving noise above the 150 dB behavioral threshold at the Mad River Bridges Highway 101 project indicate that the fish quickly habituate to the noise and resume normal surface-feeding behavior within a few minutes of the fist pile strikes (Mike Kelly, NMFS, personal observation). Therefore, NMFS believes that periodic behavioral changes caused by sub-injurious sound exposure will not result in a decrease in fitness or survival of individual listed salmonids, so these effects will be insignificant.

2.5.5 Effects to Critical Habitat

While SONCC coho and CC Chinook salmon are not expected to be present during construction, the project will affect their designated critical habitats, as well as critical habitat for NC steelhead.

RSP Placement

The proposed action includes placement of RSP around the in-channel bridge piers and on the bank below Abutment 5. As a result, potential habitat-creating scour holes at the base of the piers would be prevented, and normal erosional processes and vegetation establishment would be hindered on the armored bank. RSP would also replace approximately 0.16 acres of gravel streambed, which could interfere with production of aquatic invertebrate food sources for salmonids. Additionally, the placement of RSP at Pier 4 and the bank below Abutment 5 will further constrict the channel width at this location.

Bank stabilization arrests a river's ability to migrate laterally and create/maintain aquatic habitat, and can result in channel incision and other unfavorable morphological responses. Additionally, RSP bank stabilization degrades the local habitat by interfering with benthic food production; interfering with establishment of overhanging riparian vegetation and associated cover and food production; providing poor quality cover for rearing salmonids; and enhancing habitat for salmonid predators like sculpin (Peters et al. 1998).

Because the action may prevent formation of habitat by arresting normal channel function in the action area, it may adversely impact the critical habitat PBF of juvenile summer and winter rearing areas at this location. While the length of the stabilized reach is only 115 feet and is in a location that is already partially stabilized with patchy RSP, it will extend in time the poorly functioning condition of the location. Therefore, the arrest of potential habitat forming processes

in this location compared to the existing condition is likely to perpetuate the loss of future habitat creation, which constitutes an adverse effect to critical habitat for salmonids.

The loss of invertebrate food resources where RSP replaces natural gravel is not likely to be measurable in any meaningful way relative to the overall availability of food resources in the action area. Therefore, effects to the PBF of juvenile summer and winter rearing habitat is likely to be insignificant.

The RSP will be keyed in so that the top of the RSP will initially be level with the riverbed at all locations. Depending on annual scour and deposition around the RSP locations, the RSP may alternate between being buried and exposed. The width between the RSP at Pier 4 and the bank below Abutment 5 will be approximately 46 feet over a distance of approximately 115 feet, so the actual low-water channel width will be limited to 46 feet when the main channel or a secondary channel is present at this location and the RSP is exposed. Depending on riverbed and gravel bar conditions, this constriction may average as much as 10-feet narrower than the existing channel at low flow. This constriction could potentially affect the PBFs of adult and juvenile migration corridors. However, NMFS does not believe that this constriction will raise water velocity enough to prevent or delay migration. Therefore, the effect to migrating salmonids would be insignificant.

Additionally, upstream and downstream channel conditions could be altered by changes in hydrology due to the constriction between Pier 4 and the bank below Abutment 5, which could also affect the PBF of juvenile summer and winter rearing habitat in the action area. However, a low flow constriction of 10 feet in a channel that averages about 350 feet in the action area means that any changes to the channel and habitat are likely to be limited to the immediate area around the constriction. NMFS believes that the location and splitting of the low flow channel(s) is forced by the skew in the bridge piers, so it is unlikely that the localized restriction would counteract that dominant forcing. Impacts to juvenile rearing habitat along the upstream bank could be positive, negative or neutral; and given the limited area affected, impacts are likely to be insignificant.

Riparian Vegetation

The existing condition of the banks under the bridge also includes shading and tree growth height restriction due to the bridge, which is not conducive to establishment of healthy riparian vegetation and trees large enough to provide future structural components of in-stream habitat. The addition of RSP to the banks below the abutments will make potential establishment of functional riparian vegetation slightly less likely than under the existing condition. However, the change would not likely produce any measurable impact to existing PBF's in the action area; therefore, the further diminishment of low quality riparian function is likely to have an insignificant impact on critical habitat.

Additionally, during construction of access roads, Caltrans proposes to remove up to 0.4 acres of riparian vegetation consisting of willows, poison oak, horsetail, and sapling cottonwoods. This activity could diminish the quality of the PBF of juvenile summer and winter rearing habitat. However, removal of this quantity and quality of riparian vegetation is unlikely to have a measurable effect on this PBF. Additionally, Caltrans proposes to replant this area, so any impacts should be temporary and insignificant.

2.5.5 Combined Effects

The potential exists for simultaneous construction-related impacts to have a synergistic effect that is greater or different than each stressor acting alone. Simultaneous project impacts may include visual impacts from workers and equipment working near or over the watercourse at the same time that fish may be exposed to noise and vibration from construction equipment. Fish may also be exposed to noise and/or visual disturbances during minor increases in turbidity.

Most potential project impacts would not occur simultaneously due to logistics of construction that require one phase of the project to be completed prior to starting another. Additionally, fish will be relocated from approximately 150 feet upstream and downstream of the bridge, so exposure to simultaneous stressors is unlikely. Therefore, combined effects of individual construction elements are extremely unlikely and discountable.

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). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. The project is intended to protect the bridge from seismic events, so highway traffic will continue through 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).

SONCC coho salmon, CC Chinook salmon, and NC steelhead in the action area are likely to be affected by future, ongoing non-federal activities like cannabis cultivation, timber harvest, and recreation from upstream sources. Cannabis cultivation requires water to be diverted from streams or otherwise removed to irrigate crops, contributing to diminished stream flow and higher water temperatures.

2.7 Integration and Synthesis

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

As described in NMFS' Coastal Multispecies Recovery Plan (2016), NC steelhead have declined significantly from historic numbers. Summer run populations of NC steelhead are in very poor

condition. Due to the timing of the Project, NMFS expects that no CC Chinook salmon or SONCC coho salmon will be present during construction. NMFS expects that only a limited number of juvenile NC steelhead will be present. As described in the Effects of the Action section, NMFS expects that very few, if any, of these fish will be handled or injured during relocation, and no other individuals would be injured due to other project elements. NMFS thinks a reasonable estimate, based on habitat quality and Caltrans' snorkel surveys, would be 12 juvenile steelhead handled and relocated in each of two years, and perhaps one would be killed in each year.

Outside of the action area, NC steelhead continue to be present in the Eel River watershed and many Eel River tributaries. Due to the relatively large number of juveniles produced by each spawning pair, spawning in the Eel River watershed and the broader population areas would be expected to produce enough juveniles to replace any that were lost at the project site due to injury from handling and relocation. NMFS does not expect that the small loss of juveniles by this project would impact future adult returns of NC steelhead.

The action area could be subject to higher average summer air temperatures and lower total precipitation levels due to climate change. Higher air temperatures would likely warm stream temperatures. Reductions in the amount of precipitation would reduce stream flow levels and estuaries may also experience changes in productivity due to changes in freshwater flows, nutrient cycling, and sediment amounts. For this project, all construction activities should be completed by 2024 or 2025 and the above effects of climate change are unlikely to be detected within that time frame. The short-term effects of project construction would have completely elapsed prior to these climate change effects, and potential longer term habitat impacts are likely to be insignificant. Therefore, changes to critical habitat due to the project are unlikely to appreciably reduce the likelihood of survival and recovery of NC steelhead, SONCC coho salmon, and CC Chinook salmon.

2.8 Conclusion

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

2.9 Incidental Take Statement

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

conditions of this ITS.

2.9.1 Amount or Extent of Take

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

> Take of juvenile NC steelhead in the form of capture is expected during fish relocation and diversion activities. Up to 12 juvenile steelhead are expected to be captured and relocated during each year of the Project. Because mortality resulting from relocation activities, including netting and electrofishing, is estimated to be about three percent; up to one steelhead mortality is expected each year. Please refer to sections 2.9.3 and 2.9 below for monitoring and reporting requirements.

2.9.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species.

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 NC steelhead:

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

2.9.4 Terms and Conditions

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

1. The following terms and conditions implement reasonable and prudent measure 1:
    a. Caltrans or their contractor shall submit to NMFS a Construction Site Dewatering and Diversion Plan and an Aquatic Species Relocation Plan for approval a minimum of 30 days prior to implementing the plans.
    b. Qualified biologists with expertise in the areas of anadromous salmonid biology shall conduct fish relocation activities associated with construction. Caltrans will ensure that all biologists working on the project are qualified to conduct fish relocation in a manner that minimizes all potential risks to salmonids.

Caltrans or their contractor performing fish relocation shall first use a seine to herd fish out of the work site, if practicable, before using electrofishing techniques. Herding fish out of the work site with a seine prior to electrofishing will reduce the number of fish exposed to electrofishing activities and reduce the number of fish captured and subject to risks of mortality. Herding fish by using an electrofisher shall not be attempted. Biologists will begin electrofishing with a low voltage setting, e.g., 100 volts, and only increase voltage settings to the level needed to immobilize fish for capture.

c. Salmonids shall be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish must be kept in cool, shaded, and aerated water protected from excessive noise, jostling, or overcrowding or potential predators any time they are not in the stream, and fish will not be removed from this water except when released. Captured salmonids will be relocated as soon as possible to an instream location in which suitable habitat conditions are present to allow for adequate survival for transported fish and fish already present. Fish will be distributed between multiple pools if biologists judge that overcrowding may occur in a single pool.

d. Caltrans or their contractor shall monitor any screens used to block fish access on a daily basis, or more frequently if necessary, to ensure that no impingement occurs, and to assess whether significant downstream migration is occurring. If downstream-migrating fish aggregate at the screen(s), the qualified biologist will relocate these fish to suitable downstream habitat.

e. If any salmonids are found dead or injured, the biologist will contact NMFS biologist Mike Kelly by phone immediately at (707) 825-1622. The purpose of the contact is to review the activities resulting in the take and to determine if additional protective measures are required. All dead salmonid will be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location, and be frozen as soon as possible. Frozen samples will be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS Northern California Office in Arcata, California without obtaining prior written approval from the South Coast Branch Chief. Any such transfer will be subject to such conditions as NMFS deems appropriate.

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

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

b. Caltrans shall contact NMFS within 24 hours of meeting or exceeding take of listed species prior to project completion. Notify Mike Kelly by phone at 707-825-1622. This contact acts to review the activities resulting in take and to determine if additional protective measures are required.

c. If it is necessary to move additional outmigrating fish while monitoring exclusion screens, Caltrans will contact NMFS immediately to determine whether screens need to be removed to allow continued migration.

d. Caltrans shall develop and submit to NMFS for review a hydroacoustic monitoring plan. The plan shall be submitted to NMFS for approval a minimum of 30 days prior to implementing the plan.

e. Caltrans shall make available to NMFS data from the hydroacoustic monitoring on a real-time basis (i.e., daily monitoring data should be accessible to NMFS upon request).

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

    a. Caltrans shall provide a written report to NMFS by January 15 of the year following construction of the project. The report shall be sent to NMFS via email to Mike.Kelly@noaa.gov or via mail to Mike Kelly at 1655 Heindon Road, Arcata, CA 95521. The reports shall contain, at a minimum, the following information:

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

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

2.10 Conservation Recommendations

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

1. NMFS suggests that Caltrans incorporate large woody debris in the form of logs with rootwads attached into the RSP at Pier 4 and Abutment 5. By creating cover and possible scour pools, this measure would help to offset the adverse impacts to designated critical habitat due to the expansion of the RSP footprint at this location. This action would also address one of the high priority recovery actions in the SONCC COHO Recovery Plan (NMFS 2014) for the South Fork Eel River, which is to “increase large woody debris or other instream structure,” and the Coastal Multispecies Recovery Plan for CC Chinook and NC steelhead (NMFS 2016) for the South Fork Eel River, which is to “increase large wood frequency.” If Caltrans

decides to implement this recommendation, NMFS' hydraulic engineers should be consulted on the design. Please contact Mike Kelly by phone at 707-825-1622, or by email at Mike.Kelly@noaa.gov to arrange engineering collaboration.

2.11 Reinitiation of Consultation

This concludes formal consultation for South Fork Eel River Bridge Seismic Retrofit Project. As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this 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

Based on Caltrans' snorkel surveys and temperature monitoring in 2017 and 2018, their personal communications with local fisheries biologists at CDFW, the project timing, and the poor quality and quantity of summer rearing habitat, NMFS concurs that the proposed action is not likely to adversely affect SONCC coho salmon and CC Chinook salmon individuals due to their extremely unlikely, and therefore discountable, occurrence in the action area during project activities.

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 Pacific Fisheries Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

Essential Fish Habitat is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802[10]). "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard

bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). The term "adverse effect" means any impacts which reduce the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrates and loss of, or injury to, benthic organisms, prey species, and their habitats, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of it and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.910). The EFH consultation mandate applies to all species managed under a Fishery Management Plan (FMP) that may be present in the action area.

The Pacific Coast Salmon FMP addresses EFH that will be adversely affected by the Project. Furthermore, the project is located in a Habitat Area of Particular Concern (HAPC) for coho and Chinook salmon under the Pacific Coast Salmon FMP. HAPC are described in the regulations as subsets of EFH that are identified based on one or more of the following considerations: the importance of the ecological function provided by the habitat; the extent to which the habitat is sensitive to human-induced environmental degradation; whether, and to what extent, development activities are, or will be stressing the habitat type; and the rarity of the habitat type (50 CFR 600.815(a)(8)). Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process. The HAPC developed for complex channel and floodplain habitat may be adversely affected by the emergency action.

3.2 Adverse Effects on Essential Fish Habitat

Both coho salmon and Chinook salmon rearing and migration habitat occurs within the action area. The effects to coho salmon and Chinook salmon critical habitat have already been described in Section 2.5.5. The adverse effects of the action on Pacific Coast Salmon EFH are as follows:

1. Temporary habitat degradation from increased suspended sediment and turbidity.
2. Temporary loss of habitat due to water diversion and possible screening.
3. Potential loss of habitat forming processes and food production due to bank armoring and placement of RSP.
4. Reduction of the ability of riparian vegetation to re-establish in the area of bank armoring.

3.3 Essential Fish Habitat Conservation Recommendations

Caltrans proposes measures to minimize turbidity, short-term loss of instream habitat, and loss of riparian vegetation; therefore, we have no additional recommendations to address these potential adverse impacts to EFH. As described in the Effects of the Action section, placement of bank armoring in the form of large rock may reduce habitat forming processes that are linked to the

HAPC of complex channel and floodplain habitat. Therefore, NMFS suggests the following Conservation Recommendation to minimize or compensate for this adverse effect:

1. NMFS suggests that Caltrans incorporate large woody debris in the form of logs with rootwads attached into the RSP at Pier 4 and below Abutment 5. By creating cover and possible scour pools, this measure would help to offset the adverse impacts to designated critical habitat due to the expansion of the RSP footprint at this location. If Caltrans decides to implement this recommendation, NMFS' hydraulic engineers should be consulted on the design. Please contact Mike Kelly by phone at 707-825-1622, or by email at Mike.Kelly@noaa.gov to arrange engineering collaboration.

Fully implementing this EFH conservation recommendation would protect, by avoiding or minimizing the adverse effects described in section 3.2, above, up to one acre of designated EFH for Pacific Coast salmon.

3.4 Statutory Response Requirement

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

3.5 Supplemental Consultation

The 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 are Caltrans and the Federal Highway Administration. Other interested users could include the U.S. Army Corps of Engineers, the California Department of Fish and Wildlife, local landowners and conservation groups. A copy of this opinion was provided to Caltrans. The format and naming adheres to conventional standards for style. This opinion will be posted on the NOAA Institutional Repository. The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

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