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

February 16, 2021 **Refer to NMFS No:** WCRO-2020-03585

Darrell Cardiff
Senior Planner, Local Assistance
California Department of Transportation, District 1
P.O. Box 3700
Eureka, California 95502-3700

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for Caltrans' Requa Road over Hunter Creek Bridge Replacement Project (BRLO 5901 (044))

Dear Mr. Cardiff:

Thank you for your letter of December 17, 2020, requesting 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 Requa Road over Hunter Creek Bridge Replacement Project, California Department of Transportation (Caltrans[1]) Local Assistance reference BRLO 5901 (044). This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)) for this action. NMFS reviewed the likely effects of the proposed action on EFH, and concluded that the action would adversely affect the EFH of Pacific Coast Salmon. Therefore, we have included the results of that review in Section 3 of this document.

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 the Southern Oregon and Northern California Coast (SONCC) coho salmon Evolutionarily Significant Unit (ESU). NMFS expects the proposed action would result in incidental take of SONCC coho salmon. However, we do not expect the action to result in adverse impacts to individual Southern Distinct Population Segment (SDPS) eulachon. Because the action area is entirely within Yurok tribal land, no designated critical habitat is present for either species. An incidental take statement is included with the enclosed biological opinion. The incidental take statement includes non-

[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.

discretionary reasonable and prudent measures and terms and conditions that are expected to further reduce anticipated incidental take of SONCC coho salmon.

Please contact Mike Kelly at (707) 825-1622, Northern California Office, Arcata, 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: w/enclosure
Christa Unger, Caltrans Local Assistance, District 1, Eureka, CA
Jennifer Olson, California Department of Fish and Wildlife, Eureka, CA
Sarah Beesley, Yurok Tribal Fisheries Program
NMFS ARN# 151422WCR2021AR00001

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

Requa Road over Hunter Creek Bridge Replacement Project,
Del Norte County, California

NMFS Consultation Number: WCRO-2020-03585
Action Agency: California Department of Transportation

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely to Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely to Destroy or Adversely Modify Critical Habitat?
Southern Oregon/North California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*)	Threatened	Yes	No	N/A*	No
Southern Distinct Population Segment (SDPS) eulachon (*Thaleichthys pacificus*)	Threatened	No	No	N/A*	No

* The action area for this project is entirely within Yurok Tribal lands; therefore, critical habitat is not designated.

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 FMP	Yes	Yes

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: February 16, 2021

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1. INTRODUCTION

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

1.1. Background

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

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at the NMFS Northern California Office in Arcata, California.

1.2. Consultation History

On January 31, 2013 staff from Del Norte County (County), California Department of Transportation (Caltrans), Quincy Engineering, North State Resources, Inc (now Stantec), and NMFS fishery biologist Chuck Glasgow met at the project site to discuss the proposed project's design and construction.

In approximately July of 2016, current NMFS staff Mike Kelly made a site visit to the location while he was employed by Caltrans as the Local Assistance biologist and is therefore familiar with the project site. (Subsequent site visits during NMFS' technical assistance phase were not possible due to COVID-19 travel restrictions.)

On July 2, 2020, and August 4, 2020, Mike Kelly participated in calls with Caltrans, Del Norte County, Yurok Tribal Fisheries Program, Quincy Engineering, and Stantec Environmental Consulting to discuss the project. Both of these calls focused on pile driving and fish relocation technical assistance.

On November 2, 2020, Caltrans submitted a draft Biological Assessment (BA) for review.

On November 6, 2020, NMFS staff provided comments on the draft BA.

On December 17, 2020, Caltrans requested initiation of formal section 7 consultation for adverse

effects to SONCC coho salmon and Pacific Salmon EFH.

On December 18, 2020, NMFS notified Caltrans that we had initiated formal consultation.

On December 28, 2020, NMFS requested that Caltrans and the County consider not drafting water from the creeks for construction purposes. On January 15, 2021, Caltrans notified NMFS that the County accepted NMFS request.

1.3. Proposed Federal Action

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

Under MSA, Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910).

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

Caltrans and Del Norte County propose to replace an existing two-lane, three-span bridge over Hunter and Panther creeks on Requa Road in Del Norte County, California. The bridge requires replacement because it is structurally deficient, functionally obsolete, and hydraulically inadequate. The proposed bridge will be 210 feet long, have two spans with one pier, and will be constructed slightly downstream of the old bridge. Additional work to stabilize an existing stock road will occur along the bank of a downstream tributary, Minot Creek.

Caltrans proposes to conduct activities within the channels of Hunter Creek, Panther Creek, and Minot Creek between June 15 and October 15 during two years of construction. Construction is likely to begin in 2022.

The proposed action is described in detail in Caltrans' BA (Caltrans 2020). Project elements that may affect salmonids, and accompanying measures to minimize impacts, are summarized below, while the remaining project description is incorporated by reference to Caltrans' BA. In the following descriptions, "Caltrans" refers to Caltrans, Del Norte County (the applicant), and their construction contractor(s). Caltrans modified the proposed action as described in the BA to eliminate the provision to draft water for construction purposes.

1.3.1 Construction Staging and Stream Access

Caltrans will use a temporary staging area along Requa Road approximately 500 feet west of the existing bridge and creeks. The staging area is an existing large gravel turnout, so no significant grading or vegetation removal will be required.

The old bridge will remain in service until the new bridge is completed; therefore, no detour route is required. Construction access will be accommodated on the new approaches as well as on two temporary roads on either end of the new bridge. The temporary roads will provide

access to the beds of Hunter, Panther, and Minot creeks. Access to work along the creeks will include covered stream diversions intended to protect the streams from construction activities and any demolition related debris that may fall. The diversions will likely consist of cofferdams parallel to each bank and will allow for fish passage over the natural streambed between the cofferdams. The diversions will be 60 to 80 feet long with open channels of at least 10 feet wide between the cofferdams. Cofferdams will be built from material such as plastic lined gravel bags, washed gravel, and portable concrete blocks. While this type of minimally invasive diversion will maintain fish passage through the site, some fish will likely be relocated to accommodate the diversion structures as detailed in sections 1.3.6 and 2.5.1.

Qualified biologists will be employed to monitor diversion construction and conduct fish relocation. The contractor will prepare stream diversion and fish relocation plans, and Caltrans will provide these plans to NMFS for review of consistency with the anticipated effects analyzed in this opinion.

Access and construction of the new bridge and roadway will require removal of red alders and willows from riparian areas of the three creeks. The area of tree removal is approximately 450 feet by 100 feet, which is approximately one acre. These species will be replanted within the footprint of the old bridge and roadway. However, up to 0.25 acres of riparian vegetation will be permanently displaced due to the new bridge structure.

1.3.2 Old Bridge Demolition

The existing bridge will be removed during the second season after the new bridge is complete. The contractor will prepare a demolition plan that will include measures such as the stream diversion intended to prevent debris from entering the creek. The existing bridge will be broken up with a hydraulic hammer mounted on an excavator (hoe-ram) and the debris will be removed. The existing piers will be broken down and removed in a similar way. The pier piles will be removed at least three feet below the streambed elevation. The existing bridge materials including decking, abutments, and piers, will be removed and disposed of offsite. The existing roadway will be removed, and the area will be restored by grading to match existing contours and replanting native vegetation.

The existing bridge has one pier within the present active channel. This pier will be removed and a log habitat structure will be placed in approximately the same location to provide scour to maintain an existing pool.

1.3.3 New Bridge and Road Construction

The new bridge will be a two-span steel girder bridge supported by abutments and a single pier. The new bridge abutments and single pier will each be founded on two sixty-inch cast-in-steel-shell (CISS) pipe piles. These piles will initially be installed using a vibratory hammer, but they will be finished using a diesel impact hammer. As described in section 1.3.4, hydroacoustic monitoring will be conducted to ensure that sound levels do not exceed fish barotrauma thresholds. The new bridge deck will be constructed in place and made of reinforced concrete.

The bridge will be a total of 210 feet long with a 150-foot main span and a 60-foot approach span.

Roadway approach construction will include fills up to 20 feet deep. Wick drains will be needed to allow for consolidation settlement to occur during construction and to prevent excessive settlements to occur after the project is completed. Water from wick drains will not discharge directly to surface waters. Construction of the bridge abutments will require two excavation areas, each measuring approximately 30 feet long by 12 feet wide by 10 feet deep. If these or other excavations require pumping of "nuisance water," the water will be pumped into a structure away from the channel consisting of either a settling basin or storage tank. The new bridge and the approach embankments will not encroach into the creek channels below OHWM. Scour protection of the abutments is expected to consist of approximately 27 steel sheet piles placed around the channel-facing sides of each abutment.

Additionally, 40 to 50 feet of rock slope protection (RSP) will be keyed in along the north bank of Minot Creek adjacent to the new pier to protect an existing stock trail. Installation of the RSP will occur in the streambank (with Minot Creek confined in the proposed open channel diversion) by digging a keyway trench (which may need shoring by sheet piles), placing RSP, and removing the sheet piles. This will avoid impinging on the hydraulic capacity of the channel. Willow cuttings will be incorporated into this RSP.

Similar to the existing bridge, storm water from the new reinforced concrete bridge deck will pass through scuppers in the bridge rail. Stormwater from the new roadway will sheet flow off road surfaces onto road shoulders.

1.3.4 Monitoring

During impact pile driving and demolition activities (hoe-ram operations), hydroacoustic monitoring would ensure that pile driving stops in a given day before sound levels reach the cumulative injury thresholds at the predicted attenuation distances. The contractor will prepare a detailed Hydroacoustic Monitoring Plan, which will be submitted to NMFS for review prior to project activities. Caltrans will also provide a detailed report of all hydroacoustic monitoring results. Additionally, a qualified biologist will monitor all in-stream construction activities to ensure adherence to all environmental permit conditions and avoidance and minimization measures.

1.3.5 Conservation Measures and Best Management Practices

Water pollution control scheduling and methods will be specified in the contractor's Storm Water Pollution Prevention Plan (SWPPP) and Environmental Commitments Record for the proposed action. Specific methods are indicated in Caltrans' Construction Site Best Management Practices (BMP) Manual (Caltrans 2017). Caltrans' BA provides details on specific measures. Most of these measures are standard practices that have proven efficacy and are familiar to NMFS' staff. Please refer to Caltrans' BA and the above-referenced manuals for details.

1.3.6 Aquatic Species Relocation

Stream diversions may require relocation of coho salmon juveniles and other aquatic species. Caltrans will prepare an Aquatic Species Relocation Plan for NMFS' review prior to project implementation. Methods may include seining gear, electrofishing gear, and dip nets. Caltrans proposes to partially construct each cofferdam, leaving the downstream end open to facilitate "herding" of fish out of the dewatered area before closing the end. This will minimize handling of fish. Any remaining fish would then be removed from the area and released to suitable habitat. Electrofishing for salmonids would comply with Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act (NMFS 2000), and any seining or other capture and removal techniques would adhere to the California Salmonid Stream Habitat Restoration Manual (Flosi et al. 2010).

1.3.7 Other Activities Caused by the Proposed Action

We considered whether or not the proposed action would cause any other activities and determined that it would not. The new bridge will serve the same function as the current bridge without inducing additional traffic or facilitating use by types of vehicles unable to use the current bridge.

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

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

Caltrans determined the proposed action is not likely to adversely affect SDPS eulachon. Our concurrence is documented in the "Not Likely to Adversely Affect" Determinations section (Section 2.12).

2.1. Analytical Approach

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

survival and recovery of the species. 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:

- Evaluate the rangewide status of the species expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species in the action area.
- 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, analyze whether the proposed action is likely to 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.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

The action area is entirely within designated tribal lands and, therefore, is not considered designated critical habitat for SONCC coho salmon or SDPS eulachon. Therefore, critical habitat for these species will not be considered in this biological opinion, though habitat impacts that may affect individuals are analyzed.

2.2. Rangewide Status of the Species

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02.

2.2.1 SONCC Coho Salmon Description and General Life History

Coho salmon have a generally simple 3-year life history. The adults typically migrate from the ocean and into bays and estuaries towards their freshwater spawning grounds in late summer and fall, and spawn by mid-winter. Adults die after spawning. The eggs are buried in nests, called redds, in the rivers and streams where the adults spawn. The eggs incubate in the gravel until fish hatch and emerge from the gravel the following spring as fry. These young-of-year fish typically rear in freshwater for about 15 months before migrating to the ocean. The juveniles go through a physiological change during the transition from fresh to salt water called smoltification. Coho salmon typically rear in the ocean for two growing seasons, returning to their natal streams as 3-year-old fish to renew the cycle.

2.2.2 Status of SONCC Coho Salmon

In this biological opinion, NMFS assesses four population viability parameters to help us understand the status of coho salmon and their 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) to determine the general condition of each population and factors responsible for the current status of the SONCC coho salmon 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).

SONCC Coho Salmon Abundance and Productivity: Although long-term data on coho salmon abundance are scarce, the available evidence from short-term research and monitoring efforts indicate that spawner abundance has declined since the last status review for populations in this ESU (Williams et al. 2016). In fact, most of the 30 independent populations in the ESU are at high risk of extinction because they are below or likely below their depensation threshold, which can be thought of as the minimum number of adults needed for survival of a population.

SONCC Coho Salmon Spatial Structure and Diversity: The distribution of SONCC coho salmon within the ESU is reduced and fragmented, as evidenced by an increasing number of previously occupied streams from which SONCC coho salmon are now absent (NMFS 2001, Good et al. 2005, Williams et al. 2011, Williams et al. 2016). Extant populations can still be found in all major river basins within the ESU (70 FR 37160). However, extirpations, loss of brood years, and sharp declines in abundance (in some cases to zero) of SONCC coho salmon in several streams throughout the ESU indicate that the SONCC coho salmon's spatial structure is more fragmented at the population-level than at the ESU scale. The genetic and life history diversity of populations of SONCC coho salmon is likely very low and is inadequate to contribute to a viable ESU, given the significant reductions in abundance and distribution.

2.2.3 Factors Responsible for the Decline of SONCC Coho Salmon

The factors that caused declines 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 of SONCC coho salmon (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 Niño 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 coho salmon subject to this consultation. In the coming years, climate change will influence the ability to recover coho salmon in most or all of their watersheds. Coho salmon 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 coho salmon. 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 2014). This rise in sea level will alter the habitat in estuaries and either provide 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 coho salmon 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 Requa Road Bridge Replacement Project action area encompasses approximately 8.3 acres including all areas to be used for site access, construction activities, and equipment and materials storage and staging. The action area includes sufficient distances upstream and downstream along the three creek channels to account for potential construction related impacts to aquatic organisms from alteration of water quality, construction noise, and other disturbances. The length of stream channel included in the action area was based on conservative estimates of the potential hydroacoustic behavior impact distances associated with limited pile-driving and percussive concrete demolition, and estimates consider water depths and stream sinuosity that affect sound transmission distances in water. Accordingly, the action area extends along the wetted channel of Hunter Creek 1,000 feet upstream and downstream of the bridge alignment and 250 feet upstream in Panther and Minot creeks. Caltrans' BA includes a map that delineates the action area.

2.4. Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its habitat in the action area, without the consequences to the listed species or 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 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).

In the action area, the threat to SONCC coho 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 reduced flows and higher water temperatures.

2.4.1 Status of SONCC Coho Salmon in the Action Area

Coho salmon have a wide distribution throughout the Lower Klamath Sub-basin, but occur mostly in low abundance (NMFS 2014). Hunter Creek supports anadromous populations of coho salmon, which are known to spawn in the upper reaches of the watershed. The available data is limited, but adult spawning migration has been documented in Hunter Creek through opportunistic spawning surveys performed by Green Diamond Resource Company (GDRC 2016). A total of 11 live adults and 2 carcasses were documented between 2001 through 2014. Panther Creek does not likely support spawning populations of coho salmon given the lack of spawning gravels (Silloway and Beesley 2011). Minot Creek may also provide spawning habitat for coho salmon, though there have been no recently documented observations of spawning.

Hunter Creek in the action area provides rearing habitat for both natal and non-natal juvenile coho salmon. Coho salmon spawning in the action area is not known and is unlikely due to the position of the action area being so low in the watershed; however, appropriate spawning substrate may be available, and NMFS assumes that spawning could take place in Hunter Creek in the action area. Panther Creek joins Hunter Creek just downstream of the existing bridge and may provide limited rearing habitat, but likely serves mainly as a migratory corridor to and from the upstream Panther Pond, which provides non-natal rearing habitat. Non-natal rearing habitat provided by both streams is important for juvenile coho salmon migrating through the estuary from other tributaries (Soto et al. 2008, Hillemeier et al. 2009, Silloway 2010). Upstream migration of non-natal juvenile coho salmon into Lower Klamath tributaries (following their emigration down the mainstem Klamath corridor) has been documented in late fall/early winter, at the onset of the first substantial precipitation and associated river discharge, and during the spring months of March through June (Silloway 2010). Non-natal rearing of juvenile coho salmon in Lower Klamath River tributaries is thought to provide several benefits that may allow for relatively higher survival rates compared to fish from other parts of the basin, underscoring

the importance of these habitats (Beesley and Fiori 2004, Silloway 2010). Because non-natal rearing in Lower Klamath tributaries includes juvenile coho salmon from distant parts of the watershed, individuals in the action area could be from Upper and Middle Klamath Populations as well as the local Lower Klamath Population.

The channels of the creeks in the action area are low-gradient with gravel and sand beds and dense willows and alders along the banks. The quality of rearing habitat within Hunter and Panther creeks is favorable for coho salmon owing to water depth, structural complexity, and presence of slow and backwater habitats with cool water and overhanging vegetation. During the summers of 2009 and 2010 the Yurok Tribal Fisheries Program (YTFP) conducted snorkel surveys and mark-recapture studies in Hunter Creek to approximately 1,200 feet upstream of the Requa Road bridge, and in Panther Creek Pond. Snorkel surveys in Hunter Creek regularly identified coho salmon, cutthroat trout, and steelhead. Steelhead were the most abundant salmonid species observed with approximately 37 steelhead per 100 meters (11 per 100 feet) of stream, while densities of coho were 2-3 per 100 meters (1 per 100 feet) of stream (Silloway 2010, Silloway and Beesley 2011).

Juvenile coho salmon access into and out of the upstream wetland complex of Panther Creek during summer is questionable due to low flow levels, extensive colonization of the outlet channels by aquatic and invasive vegetation (Silloway and Beesley 2011), and the presence of a beaver dam. However, the following population estimates for the pond complex upstream of the action area may provide some idea of the importance of the channel of Panther Creek in the action area when it serves as a migration corridor for juvenile coho salmon. Panther Creek in the action area may provide some rearing habitat in summer during years with adequate flows.

Mark-recapture fish surveys were conducted throughout the available habitat in Panther Pond since 2009. Population estimates have varied in all years and YTFP has found that a majority of the juvenile coho salmon captured in Panther Pond during summer–early fall are age 1+ fish. YTFP has continued to conduct mark-recapture surveys in Panther Pond to assess population abundance of juvenile salmonids. All of the survey data indicate coho salmon appear to use a majority of the available habitat during both summer and winter, with most use occurring during the winter months. Coho salmon population estimates during the summer months varied widely from year to year, from a low of 17 individuals in July 2010 to 681 individuals in July 2015, and showing a gradual decline in the population as summer progresses with few to no individuals present in September (Silloway 2010, Silloway and Beesley 2011).

Minot Creek in the action area is often intermittent or dry during the summer, so may provide some minimal rearing habitat during project activities, though we have no recent evidence of rearing or any population estimates.

2.5. Effects of the Action

Under the ESA, “effects of the action” are all consequences to listed species that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time

and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

2.5.1 Stream Diversions and Fish Relocation

As described in section 1.3.1 and 1.3.2, Caltrans proposes to construct temporary stream diversion structures in the channels of all three creeks during the first construction season, and in the channels of Hunter and Panther creeks in the second season in order to protect the creeks from construction and demolition work occurring in and over the channels. Each diversion will consist of lateral barriers along the edges of the channel that will isolate the stream margins while allowing water to flow over the natural creek bottom between the barriers. The barriers will be constructed from material such as plastic-lined gravel bags or K-rails. Each barrier will be 60 to 80 feet long with a minimum of 10 feet of open channel between the barriers. We expect that the 10-foot spacing will allow free passage of fish and other aquatic organisms both upstream and downstream.

The structures will be covered to prevent construction and demolition debris falling into the stream or onto the streambed. The contractor will prepare a stream diversion plan that will be submitted to NMFS for review of consistency with the effects analyzed in this opinion. Depending on site conditions in a given year, individual barriers may not be placed in water, so Caltrans' plan currently anticipates the "worst case scenario."

Installation of the barriers will require relocation of aquatic species if water is present along the margins of the stream at each barrier location. Caltrans assumes that five diversions will be constructed in total, including three in the first season and two in the second season. The preliminary plan is to partially construct each barrier while leaving the downstream end open so that any fish present may be "herded" out of the enclosure using small seine nets to minimize handling of fish. Then the barrier would be closed and any remaining fish will be removed by netting and/or electrofishing.

Caltrans estimates that up to 120 juvenile coho salmon could be handled during relocation in the first season, and up to 80 could be handled in the second season. NMFS believes these estimates are very conservative based on YTFP data described in section 2.4.1, but the estimates may not be unreasonable if coho salmon were to spawn in or near the action area in a given year.

Mortality of Relocated Fish
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.

If we apply the three percent minimum mortality rate to the predicted number of juvenile SONCC coho salmon that Caltrans estimates could be captured and relocated, we would expect that up to four juvenile coho salmon could be injured or killed in the first season, and up to two could be injured or killed in the second season of construction.

2.5.2 Noise and Visual Disturbance

Vibratory Pile Driving
Caltrans will use vibratory pile driving for approximately 54 sheet piles (approximately 27 at each abutment) that will be installed to protect the new bridge abutments, and possibly on additional sheet piles if required to isolate the proposed stabilization work at Minot Creek. Also, the 60-inch CISS foundation piles will be vibrated in initially as far as possible before driving is completed using an impact hammer. Compared to impact pile driving, vibratory pile driving generally produces more continuous, lower energy sounds below the thresholds associated with injury. There are currently no established noise thresholds associated with continuous sound waves, and vibratory methods are generally considered effective measures for avoiding or minimizing the risk of injury to fish from pile driving noise. Vibratory installation may cause behavioral reactions in rearing juvenile salmonids. Juvenile salmonids may move away from the vibrations or become habituated (Mike Kelly, personal observations 2006, 2009, 2011). However, these behavioral impacts are unlikely to reduce an individual salmonid's survival and fitness.

Percussive Noise and Hydroacoustic Effects
Caltrans' BA evaluated potential underwater noise levels generated by planned construction activities, and determined that impact pile installation is unlikely to exceed currently adopted hydroacoustic noise thresholds that may cause injury to fish. Based on analyses provided in Caltrans' BA and confirmed by NMFS, single strike noise levels that are known to cause injury to fish (>206 dB re: 1 μPa) would not reach wetted areas of the creeks. Therefore, coho salmon would not be exposed to single strike injurious noise levels.

Sound energy levels above 150 dB (re: 1 μPa) can accumulate to cause barotrauma in exposed fish. This cumulative sound exposure level is abbreviated as cSEL. Based on accepted standards of the Fisheries Hydroacoustic Working Group (2008), fish under two grams may suffer barotrauma at a cSEL of 183 dB, and fish over two grams may experience barotrauma at a cSEL of 187 dB. However, levels below these thresholds do not continue to accumulate if fish are not re-exposed within 12 hours. NMFS believes that all juvenile coho in the action area would be over two grams by the beginning of each construction season; therefore, we use the cSEL standard of 187 dB to evaluate whether injury is likely.

Caltrans' BA provides the calculations used to determine the distances from the piles over which injury may be possible. Based on conservative assumptions, Caltrans predicts that injurious cSEL's could extend up to 27 meters from each CISS pile and could therefore reach waters containing juvenile coho salmon. However, Caltrans proposes hydroacoustic monitoring during impact pile driving to confirm avoidance of injurious levels of sound pressure, and activity will cease before injurious cSEL's are reached in a given day. Therefore, NMFS agrees that real time monitoring will ensure that exposure of coho salmon to injurious sound levels during pile driving will not occur.

Elevated cSEL's could also be produced during demolition of the old bridge abutments during use of a percussive hammer (hoe-ram). Distances of potential barotrauma are difficult to predict

during hoe-ram use because the total number of blows, and the number of pulses over 150 dB, cannot be accurately anticipated. Caltrans' conservative estimates indicate that injurious sound levels could reach water occupied by juvenile coho salmon. However, Caltrans will conduct hydroacoustic monitoring during abutment demolition to confirm avoidance of injurious levels of sound pressure, and activity will cease before injurious cSEL's are reached in a given day. Therefore, NMFS agrees that real time monitoring will ensure that exposure of coho salmon to injurious sound levels during abutment demolition will not occur.

Additionally, juvenile coho salmon could be exposed to underwater noise levels exceeding the behavior thresholds (150 dB) without reaching the injurious cSEL threshold. Caltrans' analysis predicts that exposure to 150 dB sound levels would occur over a radius of 789 meters from percussive activity.

Temporary behavioral changes that fish may exhibit in response to percussive noise include startling, altering behavioral displays, avoidance, displacement, and reduced feeding success. Observations of juvenile coho and steelhead exposed to pile driving noise above the 150 dB behavioral threshold at the Mad River Bridges Highway 101 project indicate that the juvenile salmonids quickly habituate to the noise and resume normal surface-feeding behavior within a few minutes of the fist pile strikes (Mike Kelly, NMFS, personal observations 2009, 2011). Therefore, NMFS believes that periodic behavioral changes caused by sub-injurious sound exposure will not result in decreased fitness or survival of individual juvenile salmonids.

2.5.3 Water Quality

Pollutants from construction operations, or from the mobilization of sediment both during and after construction, have the potential to impact water quality within the action area.

Turbidity and Sedimentation
Short term increases in suspended sedimant and turbidity are anticipated during construction and removal of the strean diversion structures. Additionally, there is likely to be an increase in suspended sediments and turbidity in the action area during the first rainfall of the season as disturbed sediments mobilize and adjust.

Increases in suspended sediment or turbidity can affect water quality, which in turn can affect fish health and behavior. Salmonids typically avoid areas of higher suspended sediment, which means they displace themselves from their preferred habitat in order to seek areas with less suspended sediment. Fish unable to avoid suspended sediment can experience negative effects from exposure.

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).

Construction of the stream diversion structures, and their removal at the end of each construction season could generate turbidity. However, Caltrans proposes to use techniques and materials that are proven to minimize turbidity to insignificant levels and durations. Therefore, NMFS considers the potential amounts and duration of turbidity to be unlikely to reduce the fitness of listed salmonids in the action area.

The first rains of the season will likely produce turbidity of short duration and low concentration, and will occur when the most vulnerable life stages are not present. Additionally, through project design and implementation of standard wet-weather BMPs, as described in detail in Caltrans' BA and Manual of Construction Site Best Management Practices (Caltrans 2017), levels of suspended sediment and turbidity during rain events are likely to be controlled sufficiently to avoid exposing salmonids to injurious durations and concentrations. Therefore, NMFS considers the potential amounts and duration of turbidity generated during rain events to be unlikely to reduce the fitness of listed salmonids in the action area.

Pollutants Associated with Stormwater Runoff and Spills
Contaminants generated by traffic, pavement materials, and airborne particles that settle may be carried by stormwater runoff into receiving waters. Stormwater runoff can introduce contaminants (e.g., copper, zinc, cadmium, lead, nickel, and other vehicle-derived chemicals) into waterways, where aquatic species can be affected. Copper and zinc are of particular concern due to their effect on salmonids at low concentrations. Dissolved copper and zinc in stormwater road runoff are difficult to remove, and have known negative effects on salmonids and other fishes (Sandahl et al. 2007). Additionally, Tian et al. (2021) found that a chemical called 6PPD-quinone, which derives from a preservative chemical used in tires, is associated with mortality of coho salmon.

The new bridge is designed to drain through scuppers to the ground and waters below – similar to how the present bridge drains. However, the project will not increase the amount of traffic in the action area, and potential delivery of traffic-related contaminants is expected to remain similar to pre-project levels, which are unlikely to be harmful to fish due to the low traffic volumes. Existing levels of roadway-type contaminant levels in the action area are unknown, but are likely to be well below harm thresholds in this rural watershed. Additionally, any rainwater that may contain contaminants would be immediately and significantly diluted upon entrainment into the flowing stream. Therefore, NMFS does not expect reductions in fitness of individual listed salmonids residing in the action area due to toxic materials in stormwater runoff.

Accidental spills from construction equipment pose a significant risk to water quality, particularly for construction activities in or near watercourses, and at the onset of the rainy season when the first flush could trigger the discharge of spilled materials. However, in-stream activities would be suspended and all construction areas stabilized and cleaned prior to the onset of the rainy season. Furthermore, the proposed minimization measures are expected to prevent chemical contamination during construction. Given the proven minimization measures and BMP's proposed, NMFS expects the likelihood of an accidental spill of contaminants reaching a waterway at a level that would harm fish to be improbable.

2.5.4 Habitat Modification

Riparian Vegetation Removal
Access and construction of the new bridge and roadway will require removal of red alders and willows from riparian areas of the three creeks. The area of tree removal is approximately 450 feet by 100 feet, which is approximately one acre. These species will be replanted within the footprint of the old bridge and roadway. However, up to 0.25 acres of riparian vegetation will be permanently displaced due to the new bridge structure.

NMFS expects that the temporary loss of approximately 0.75 acre, and the permanent loss of approximately 0.25 acre of riparian vegetation will have minimal impact on the functional values of existing riparian habitat given the small scale of the impact relative to the remaining trees in the action area. Plentiful vegetative cover will remain in the action area, and no measurable increase in water temperature or reduction in the amount of terrestrial food input into the streams is anticipated. And because no conifers will be removed, there will be no impacts to the primary source of future large woody debris contributions to the river channel. Therefore, impacts to riparian vegetation are not expected to result in any fitness consequences to individual listed salmonids in the action area.

Streambank Stabilization on Minot Creek
The proposed stabilization of approximately 40 to 50 feet of scoured streambank on Minot Creek to protect an existing stock trail will consist of keying in 0.25-ton RSP while the creek is protected within an open channel diversion, as described in section 1.3.1. The RSP will be keyed into the bank, which will prevent impinging on the hydraulic capacity of the channel. Willow cuttings will also be incorporated into this RSP. Because the stabilization structure will not alter the hydraulic capacity of the creek, and is unlikely to be in the water during base flows, we conclude that this work is unlikely to have any consequential impact to coho salmon habitat in the action area.

Pier Removal and Addition of Log Structure
Caltrans will remove an existing in-stream pier. The work location will be behind the diversion structure, so no work in flowing water will be required. This pier presently provides scour that maintains an associated pool. Removal of the pier will increase the hydraulic capacity of Hunter Creek, and Caltrans will place a log and rootwad structure to help maintain the pool while adding complex cover elements. NMFS expects this portion of the proposed action to be entirely beneficial.

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 watercourses at the same time when fish may be exposed to noise and vibration from construction equipment or pile driving activities. Fish may also be exposed to noise and/or visual disturbances during minor increases in turbidity when the work pads and detour bridge abutments are placed and removed.

Most potential project impacts would not occur simultaneously due to logistics of bridge construction that require one phase of the project to be completed prior to starting another. Because combined effects are either unlikely or of very low intensity, NMFS does not expect any reductions in listed salmonid fitness from any combined effects of individual construction elements.

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.

SONCC coho salmon may be affected by future non-federal activities, such as timber harvest, fishing activities, urban and rural development, and road construction. 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 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 (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution.

NMFS has developed a Viable Salmonid Population (VSP) concept that includes the parameters of population abundance, population growth rate, population spatial structure, and population diversity for defining a viable population which is an independent Pacific salmonid population 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 period. An ESU is typically made up of multiple independent populations. Therefore, NMFS must assess whether changes to VSP parameters of the independent populations affected by a proposed action results in a reduction in the numbers, reproduction, or distribution of the ESU as a whole.

2.7.1 Summary of Baseline, Status of the Species, and Cumulative Effects

Although there are exceptions, the majority of streams and rivers in the SONCC coho ESU have impaired habitat. Additionally, habitat in the ESU often lacks the ability to establish fully functioning features due to ongoing and past human activities. While habitat generally remains degraded across the ESU, restorative actions have likely improved the conservation value of

habitat throughout the range of the ESU. The creeks in the action area generally maintain adequate water quality and temperature through the summer and support rearing all year.

According to the SONCC Coho Recovery Plan (NMFS 2014) coho salmon in the action area would belong to the Lower Klamath Population of the Central Coastal Stratum if they resulted from spawning in the Hunter Creek watershed. However, juveniles from the Middle and Upper Klamath Populations are known to rear in tributaries of the Lower Klamath. While some tagging data could detect individuals from other populations, it is not possible to determine the origin of all fish in the action area. The Lower and Upper Klamath populations are at high risk of extinction and likely below their depensation thresholds. The Middle Klamath Population is at moderate risk of extinction and is likely above its depensation threshold (NMFS 2014).

The cumulative effects of those state and private activities that occur in the Klamath River watershed, as discussed in the environmental baseline section, may continue to impair, but not preclude the recovery of, habitat in the action area. NMFS expects that ongoing improvements in legacy effects of poor timber harvest practices and agricultural development will result in improved habitat conditions for SONCC coho salmon. Focused recovery actions as identified in the Recovery Plan (NMFS 2014) are expected to further improve habitat in the Klamath River. Additionally, due to the negligible nature of the proposed action's long-term impacts, NMFS does not expect the proposed action to exacerbate the effects of climate change on salmonids in the action area.

2.7.2 Summary of Effects to Individual Salmonids

NMFS anticipates miniscule effects to SONCC coho from expected levels of chemical contamination, temporary and permanent loss of riparian vegetation, disturbance of streambanks and the streambed due to construction access, increased sediment and turbidity during various activities, and due to exposure to sound during impact pile driving. However, adverse effects are likely due to capture, handling, and relocation efforts intended to protect fish from potential exposure to in-water work activity. Caltrans predicts that up to 120 juvenile coho salmon could be handled during relocation in the first season, and up to 80 could be handled in the second season. NMFS expects that up to four juvenile coho salmon could be injured or killed in the first season, and up to two could be injured or killed in the second season of construction.

NMFS does not expect the loss of four juvenile SONCC coho salmon in one cohort, and two in a second cohort would affect future adult returns in any cohort. NMFS expects this to be true regardless of which Klamath populations are represented (as discussed in section 2.7.1), and whether all mortalities belong to one population or are spread between populations. The loss of juveniles represents a miniscule percentage of the overall number of individuals in any of the populations. The overall number of individuals in the populations will likely provide a compensatory effect. Other areas of the Klamath River watershed are expected to continue to contribute to the population during the time period when some juveniles in the action area may be harmed or killed as a result of this proposed project. Therefore, NMFS does not expect any appreciable effects on VSP parameters, and thus, the proposed action is not expected to reduce the survival and recovery of the SONCC coho salmon ESU.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species, 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 SONCC coho 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 coho salmon may occur in the form of capture during fish relocation. NMFS expects that no more than 120 juvenile coho salmon would be captured and relocated to adjacent habitat in the first construction season, and no more than 80 would be captured and relocated in the second construction season. Of these, no more than three percent of all relocated fish would be subject to potential injury or mortality, so we conservatively estimate that four juvenile coho salmon could be killed or injured in the first construction season, and no more than two juvenile coho salmon could be killed or injured in the second construction season.

2.9.2. Effect of the Take

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

2.9.3. Reasonable and Prudent Measures

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

NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of SONCC coho salmon:

1. Undertake measures to ensure that harm and mortality to threatened coho salmon resulting from fish relocation 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 RPMs (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. 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 which minimizes all potential risks to salmonids. A stream diversion and fish relocation plan that includes the qualifications of biologists conducting the fish relocation shall be submitted to the NMFS Arcata office not later than 30 days prior to stream diversion activities.

    b. 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 areas if biologists judge that overcrowding may occur in a single area.

    c. 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 salmonid mortalities will be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location, fork length, 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. 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).

3. 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, California 95521. The reports shall contain, at a minimum, the following information:

      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 any unanticipated effects had any effect on ESA-listed fish; the number of salmonids killed or injured during Project construction; and photographs taken before, during, and after the activity from photo reference points; and a qualitative assessment of the fate of any individual salmonids exposed to noise above barotrauma thresholds.

      Fish Relocation – The report will 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; 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 regarding the development of information (50 CFR 402.02).

While no conifers, which provide long-term instream habitat value, will be removed, the removed alder and willow trees could have shorter term habitat value if placed in streams or left where they would be mobilized by high winter flows. Therefore, NMFS recommends that Caltrans coordinate with the Yurok Tribal Fisheries Department to make available any trees that are removed during construction for habitat restoration projects.

2.11 Reinitiation of Consultation

This concludes formal consultation for the Requa Road over Hunter Creek 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 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 that was not considered in the biological opinion, or (4) a new species is listed that may be affected by the action.

2.12 "Not Likely to Adversely Affect" Determinations

Based upon known presence of Pacific eulachon (*Thaleichthys pacificus*) in the Lower Klamath River as well as their life history characteristics, Caltrans concludes that the action area could provide spawning habitat for eulachon. However, no known surveys for eulachon have been conducted in the creeks of the action area, and their seasonal presence is inferred. The peak spawning entry of eulachon into river systems is typically during February and March (75 FR 13012), and Larson and Belchik (1998) note that spawning migrations of eulachon have been found in the Lower Klamath River as early as December and as late as May. Newly hatched larvae are immediately washed downstream after hatching a few weeks after spawning (Moyle 2002). Therefore, no life stage of eulachon would be present in the action area during the

construction season between June 15 and October 15 and therefore all of the effects of the Project would be discountable for individual eulachon.

While the proposed in-stream portions of the proposed action could disturb areas of potential spawning substrate, the streambed would return to a natural condition after the first few heavy rains of winter. Adult eulachon would not likely spawn in the location until after this time; therefore, disturbance to spawning substrate would be inconsequential. Other potential impacts to eulachon habitat (e.g., sedimentation, riparian disturbance) are described in the Effects of the Action section above, and would apply to eulachon habitat as well as salmonid habitat. Based on these analyses, none of the other potential impacts would be of consequence.

Based on this analysis, NMFS concurs with Caltrans that the proposed action is not likely to adversely affect SDPS eulachon.

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

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," and includes the physical, biological, and chemical properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH [CFR 600.905(b)]

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

3.1 Essential Fish Habitat Affected by the Project

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 a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle. 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. Adverse effects may be 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.

There is suitable habitat for juvenile salmonid rearing, adult salmonid holding, and adult salmon spawning in the action area. Habitat Areas of Particular Concern (HAPC) are described as complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation. HAPCs exist in the action area as: complex channel and spawning habitat, and floodplain habitat.

3.2 Adverse Effects on Essential Fish Habitat

The potential effects to salmonid habitat have already been described in the *Effects* section. The adverse effects to EFH and HAPCs in the action area include:

1. Temporary reduction in available habitat due to presence of stream diversion structures.
2. Noise and visual disturbance during impact pile driving, pier demolition, and associated construction activities.
3. Temporary reduction in water quality caused by increase in suspended sediments and turbidity during construction of the work pads and detour bridge abutments, and the first rain events following construction.
4. Temporary and permanent loss of riparian vegetation.

3.3 Essential Fish Habitat Conservation Recommendations

The anticipated adverse effects from the proposed action are temporary and minor. However, NMFS has the following EFH recommendation:

> While no conifers, which provide long-term instream habitat value, will be removed, the removed alder and willow trees could have shorter term habitat value if placed in streams or left where they would be mobilized by high winter flows. Therefore, NMFS recommends that Caltrans coordinate with the Yurok Tribal Fisheries Department to make available any trees that are removed during construction for habitat restoration projects.

3.4 Supplemental Consultation

Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (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 user of this opinion is Caltrans. Other interested users could include the applicant (Del Norte County), CDFW, and the Yurok Tribe. Individual copies of this opinion were provided to Caltrans. The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adhere 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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