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

January 27, 2022 **Refer to NMFS No:** WCRO-2022-00165

Jim McIntosh
Acting Senior Environmental Planner, E-2
North Region Environmental
California Department of Transportation, District 1
1656 Union Street
Eureka, California 95501

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for Caltrans' Fish Creek Fish Passage Project on State Route 254 in Humboldt County, California

Dear Mr. McIntosh:

Thank you for your letter of January 25, 2022, 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 Fish Creek Fish Passage Project on State Route 254, California Department of Transportation (Caltrans[1]) reference EA 01-0E790. 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. This letter transmits NMFS' final biological opinion and EFH response for the proposed Fish Creek Fish Passage Project.

The enclosed biological opinion describes NMFS' analysis of effects on threatened Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), the California Coastal (CC) Chinook salmon *(O. tshawytscha)*, and the Northern California (NC) steelhead (*O. mykiss*), and their designated critical habitat 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 the SONCC coho salmon, CC Chinook salmon, and NC steelhead, nor is the project likely to destroy or adversely modify designated critical habitat for these species. NMFS expects the proposed action would result in incidental take of SONCC coho salmon, CC Chinook salmon, and NC steelhead. An incidental take statement with terms and conditions is included with the enclosed biological opinion.

[1]Pursuant to 23 USC 327, and through a series of Memorandum of Understandings beginning June 7, 2007, the Federal Highway Administration (FHWA) assigned and Caltrans assumed responsibility for compliance with Section 7 of the federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for federally-funded 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.

The enclosed EFH consultation was prepared pursuant to section 305(b) of the MSA. The proposed action includes areas identified as EFH for species managed under the Pacific Coast Salmon Fishery Management Plan (FMP). Based on our analysis, NMFS concludes that the project would adversely affect Pacific Coast Salmon EFH. However, upon completion, the project will likely provide substantial improvements to salmonid EFH, so we have not provided EFH Conservation Recommendations.

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: Susan Leroy, Caltrans, District 1, Eureka, CA
Jennifer Olson, California Department of Fish and Wildlife, Eureka, CA
e-file FRN 151422WCR2022AR00030

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

Fish Creek Fish Passage Project

Humboldt County, California

NMFS Consultation Number: WCRO-2022-00165

Action Agency: California Department of Transportation

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	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	Yes	No	No
California Coastal (CC) Chinook salmon (*O. tshawytscha*)	Threatened	Yes	No	No
Northern California (NC) Steelhead (*O. mykiss*)	Threatened	Yes	No	No

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

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: January 27, 2022

Table of Contents

1. INTRODUCTION

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

1.1. Background

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

1.2. Consultation History

On October 2, 2014, NMFS biologist Mike Kelly, while working for the California Department of Transportation (Caltrans), made a site visit during Caltrans' initial project development process.

On December, 16, 2019, Caltrans hosted a multi-agency field visit, which included NMFS biologist Mike Kelly, at Fish Creek to discuss bridge options.

On August 11, 2020, Caltrans personnel met with NMFS biologist Mike Kelly to discuss whether the Caltrans Programmatic Biological Opinion (PBO) could cover the project. We determined that the proposed project did not fit the terms of the PBO and would require a separate section 7 consultation.

On December 9, 2020, Caltrans provided an online presentation and discussion of draft plans with resource agency personnel including NMFS biologist Mike Kelly and NMFS engineer John Wooster. At this time, John Wooster expressed concerns that the proposed bridge would not fully meet NMFS fish passage guidelines and suggested that the bridge be designed to span the bankfull channel at a minimum. (The final proposal is for a bridge that spans the bankfull channel; however, site constraints do not permit spanning the channel migration zone. Therefore, the project will provide full fish passage, but may impede natural channel forming processes in the future.)

On June 22, August 12, August 24, September 23, and October 28, 2021, Caltrans hosted online meetings to discuss design changes to the project based on resource agency input, and to coordinate permitting needs. Mike Kelly and John Wooster attended.

On November 3 and November 16, 2021, Caltrans hosted online meetings to discuss stream channel restoration and placement of large woody debris. Mike Kelly and John Wooster attended.

On November 22, 2021, Caltrans Environmental Senior for District 1, Brandon Larsen, hosted a discussion about the section 7 consultation process with his staff and NMFS staff Mike Kelly and Jeffrey Jahn.

On December 22, 2021, Caltrans obtained an updated official species list.

On December 23, 2021, Caltrans biologist Susan Leroy provided a draft Biological Assessment (BA) to Mike Kelly for review.

On December 27, 2021, Mike Kelly provided comments on the draft BA via email.

On January 25, 2022, Caltrans submitted a revised BA and requested initiation of formal section 7 consultation for adverse effects to threatened Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), California Coastal (CC) Chinook salmon (*O. tshawytscha*), and Northern California (NC) Steelhead (*O. mykiss*), their designated critical habitat, and Pacific Salmon Essential Fish Habitat (EFH).

On January 26, 2022, Susan Leroy confirmed that no pesticides will be used for the proposed action.

On January 26, 2022, NMFS accepted the BA and notified Caltrans that we had initiated formal consultation.

1.3. Proposed Federal Action

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

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would not. The proposed action will not facilitate use of the affected road by vehicles that cannot use the existing facilities, so we do not expect the proposed action to facilitate any new activities.

The proposed action is described in detail in Caltrans' BA (Caltrans 2022) and supplemental materials as described in the Consultation History section above. Project elements that may affect coho salmon, Chinook salmon, or steelhead or their designated critical habitats, 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 and their construction contractor(s).

Caltrans is proposing to replace an existing undersized and overly steepened concrete box culvert with a 32-foot-wide by 40-foot-long single span bridge at Fish Creek on State Route 254 in Humboldt County, at post mile 4.18, north of Phillipsville. The project does not address a transportation need and is intended solely as a fish passage project to restore fish passage to an estimated 2.3 miles of habitat upstream.

The project is scheduled as a one-season project and Caltrans anticipates it will take place between January 1, 2023, and October 31, 2023. In-channel work activities will be conducted between June 15 and October 15. Construction will require approximately 139 working days.

All activities associated with the bridge replacement are planned to be conducted during daylight hours. However, nighttime work may be required to meet the construction schedule in case of unforeseen delays. Therefore, artificial night lighting may be required. The use of artificial lighting would be temporary and of short duration, and lighting would be focused specifically on the portion of the bridge actively under construction to reduce potential disturbance to sensitive species.

1.3.1. Construction Staging, Access, and Vegetation Removal

Staging
State Route 254 will be closed to regular traffic and staging will occur on the roadway itself, as well as in wide pullouts in the project vicinity, and in an unpaved parking area by the river access road south of Fish Creek. No vegetation clearing will be required at staging areas.

Access
A temporary access road will be required for work below the bridges. The proposed access road will likely be constructed at the southeast corner of the existing crossing, and will be approximately 15 feet wide. If angular rock is required to stabilize the road surface within the riparian zone and below the ordinary high-water marks, it will be constructed so that crushed rock does not mix with native substrate, and all crushed rock will be removed when the access road is decommissioned. Any rounded gravel or crushed rock will be free of oils, clay, debris, and organic matter.

If water is flowing in the creek at the time of construction, Caltrans will divert the stream to provide a dry work area. The water will likely be diverted through a gravity-fed pipe system sized to accommodate expected flows and to allow downstream fish passage. The diversion would be approximately 500 feet long and would extend from a temporary cofferdam approximately 160 feet upstream of the current roadway approximately 340 feet downstream. The diversion will be done in conformance with a Construction Site Dewatering and Diversion Plan (Caltrans 2014). The plan will also describe methods to capture groundwater that enters the project area so that turbid waters do not enter surface waters.

Fish may be present within the limits of the diversion. If so, a qualified biologist will relocate fish prior to implementing the diversion. The contractor will be required to provide Caltrans an Aquatic Species Relocation Plan (as part of the Construction Site Dewatering and Diversion Plan) for approval prior to any diversion. Caltrans will provide this plan to NMFS and the California Department of Fish and Wildlife (CDFW) for review to ensure that the plan is consistent with the assumptions made in this opinion.

Vegetation removal
To make way for the bridge, and due to their proximity to the excavation of the existing concrete box culvert, three trees larger than two feet in diameter at breast height (DBH) will be directly impacted by channel excavation downstream, and will need to be removed. These include two coast redwoods of 2.1 feet and 2.8 feet DBH, and one bigleaf maple of 2.8 feet DBH. Multiple other small diameter trees on the upstream and downstream side will be removed, including an alder, another maple, and several redwoods—all less than 12 inches DBH. Additionally, some trees may be limbed or topped for safety purposes and to allow swing radius for a crane. As many of these trees as possible will be placed back in the channel as large woody debris (LWD) for habitat enhancement. These impacts to trees will also be addressed in the project Revegetation Plan. Approximately 0.03 acre of removed vegetation will be permanent where new impervious surface will be created.

1.3.2. Old Culvert demolition

Demolition of the old culvert will be relatively simple and will not require a demolition plan as is typical for bridge demolition. The fill surrounding the culvert will be excavated and the concrete culvert will be broken up using an excavator-mounted hydraulic hoe ram and/or jackhammers. All concrete material will be captured and disposed of. Removal of the culvert and associated fill will open approximately 0.14 acre of the channel and improve flow patterns.

1.3.3. Construction of New Bridge

The bridge deck will be rigidly connected to the abutments to minimize the footing sizes, which will minimize the need to excavate for the abutments and will allow a longer free span over the creek. The abutments will be supported on 24-inch diameter cast-in-drilled-hole (CIDH) reinforced concrete piles. The clearance of the bridge over the stream channel will be approximately 17 to 18 feet. The superstructure of the bridge will be a 15-inch-deep, precast and prestressed voided concrete slab with a 6-inch-thick cast-in-place concrete composite deck. The proposed bridge will expand lane width from 10 feet to 11 feet. The project will also widen the shoulders from under one foot to four feet on the left side and two feet on the right side. There will be no drainage scuppers on the deck, so stormwater will flow to the ends of the bridge and likely soak in or be filtered through vegetation.

Bridge construction would start by excavating the roadway fill prism down to the bridge foundation elevations on either side of the existing culvert. Asphalt paving removed would be disposed of by the contractor to a permitted site or re-used in asphalt.

A wall of CIDH piles will support the abutments. Drilled holes will have a steel reinforcement cage placed inside, and then concrete will be pumped into the hole. If the drilled holes

experience caving or if excessive water is present in the holes, temporary steel casings may be used to stabilize the hole. Where a temporary steel casing is used, the casing would be extracted as the concrete is placed. Additionally, drilling slurry (stabilizing fluid) may be used if the pile cannot otherwise be constructed in a dry or dewatered hole. Any water or slurry displaced from the drilling or placement of concrete would be pumped into a temporary evaporation pond or storage tank to be transported to a permitted disposal site. After piles are installed, forms and reinforcing steel will be placed, and then concrete will be poured to form the abutments.

Because of the very narrow clearance to nearby redwood trees adjacent to the highway, a hybrid wingwall system will be used. For the northeast wingwall, up to approximately eight feet will be cast within the abutment excavation. To minimize excavation near the trees, a steel sheet pile system will be used. The sheet pile system will be placed with a vibratory pile driver and will extend from near the trees, and will connect to the partial concrete wingwalls over a distance of approximately 12 feet.

The southwest wingwall will be a Standard Plan Type 1 retaining wall. Construction of this wall will include extending the stepped excavation for the footing approximately 10 feet toward the road centerline to the beginning of the wall approximately 50 feet south of the bridge. Forms and reinforcing will be placed to form the base of the retaining wall, and concrete will then be poured into the forms. After the footing is constructed, reinforcing steel and forms will be placed on top of the footing up to the finish grade of the roadway, and concrete will be pumped into the forms to form the wingwall.

After the abutments are constructed, the precast slabs will be placed on top of the abutments. Reinforcing for the cast-in-place concrete deck topping will be placed, and concrete will be poured. After construction of the bridge deck, the abutments will be backfilled with soil and compacted.

Bridge rails will be formed concurrently with the backfilling of the abutment walls. Bridge rail construction will consist of placing forms and reinforcing steel then pouring concrete. Staining of architectural finishes will take place after the concrete has had sufficient time to cure.

1.3.4. Construction of the New Road Approaches

After the new bridge is constructed, the roadway approaches will be constructed and tied into the bridge abutments. Route 254 in the project location includes two 10-foot lanes and maximum one-foot shoulders. The new roadway will include two 11-foot lanes and four-foot shoulders on one side, and two-foot shoulders on the other side. This expansion would result in 0.03 acre of net new impervious area.

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. 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. Refer to Caltrans' BA and the above-referenced manuals for details.

1.3.6. Stream Channel Restoration and Enhancement

Caltrans is presently collaborating with staff from CDFW, NMFS, and Humboldt Redwoods State Park (HRSP) to create a channel design that incorporates LWD to improve channel form and provide fish habitat. Caltrans will also design bio-stabilization features to reduce scour at the bridge and protect trees along the channel bank. While these features are still being designed, Caltrans' coordination with the resource agencies provides confidence that we can evaluate potential effects to critical habitat before a full design is complete.

The channel will be regraded from 155 feet upstream of the new bridge centerline to a point 334 feet downstream of the bridge. The upstream channel will be graded at 4.1% up to the roadway centerline and at 2.9% downstream from the centerline, and large woody debris structures would be installed in the channel downstream of the bridge. Due to the aggradation of material upstream of the undersized culvert, excess streambed material will be removed and used to help fill the hole created by removal of the culvert and to build the downstream channel elevation as necessary. Additionally, some imported clean streambed material may be required to balance the grade through the channel.

1.3.7. Mitigation

To comply with sections 2080.1 and 2081(b) of Fish and Game Code, Caltrans must minimize and fully mitigate the impacts of its activities. However, CDFW has determined that the benefits associated with opening fish passage outweigh any potential impacts to fish species listed under the California Endangered Species Act. Therefore, no mitigation for listed fish species is required.

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

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

2.1. Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly

or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

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

The designations of critical habitat for SONCC coho salmon, CC Chinook salmon, and NC steelhead use the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision does not change the scope of our analysis, and in this opinion we use the terms "effects" and "consequences" interchangeably.

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

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

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and

listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the PBFs that are essential for the conservation of the species.

2.2.1. Species Description and General Life History

SONCC Coho Salmon: 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 during the spring months. 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.

CC Chinook Salmon: The CC Chinook salmon ESU are typically fall spawners, returning to bays and estuaries before entering their natal streams in the early fall. The adults tend to spawn in the mainstem or larger tributaries of rivers. As with the other anadromous salmon, the eggs are deposited in redds for incubation. When the 0+ age fish emerge from the gravel in the spring, they typically migrate to saltwater shortly after emergence. Prey resources during out-migration are critical to Chinook salmon survival as they grow and move out to the open ocean.

NC Steelhead: 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 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 between March 1 and July 1 each year, although they have been observed as late as September (Ricker et al. 2014). Additionally, summer run steelhead, which are listed as endangered under the California Endangered Species Act, are present in several tributaries in the Eel River basin, but they have not been detected in the South Fork Eel River since the 1960's (CDFW 2014).

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 each species 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) and Coastal Multispecies Recovery Plan (NMFS 2016), to determine the general condition of each population and factors responsible for the current status of each DPS or 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).

Status of SONCC Coho Salmon

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.

Status of CC Chinook Salmon

CC Chinook Salmon Abundance and Productivity: Low abundance, generally negative trends in abundance, reduced distribution, and profound uncertainty as to risk related to the relative lack of population monitoring in California have contributed to NMFS' concern that CC Chinook salmon are at risk of becoming endangered in the foreseeable future throughout all or a significant portion of their range. Where monitoring has occurred, Good et al. (2005) found that historical and current information indicates that CC Chinook salmon populations are depressed. Uncertainty about abundance and natural productivity, and reduced distribution are among the risks facing this ESU. Concerns regarding the lack of population-level estimates of abundance, the loss of populations from one diversity stratum[2], as well poor ocean survival contributed to the conclusion that CC Chinook salmon are "likely to become endangered" in the foreseeable future (Good et al. 2005, Williams et al. 2011, Williams et al. 2016).

CC Chinook Salmon Spatial Structure and Diversity: Williams et al. (2011) found that the loss of representation from one diversity stratum, the loss of the spring-run history type in two diversity substrata, and the diminished connectivity between populations in the northern and southern half of the ESU pose a concern regarding viability for this ESU. Based on consideration of this

[2] A diversity stratum is a grouping of populations that share similar genetic features and live in similar ecological conditions.

updated information, Williams et al. (2016) concluded the extinction risk of the CC Chinook salmon ESU has not changed since the last status review. The genetic and life history diversity of populations of CC Chinook salmon is likely very low and is inadequate to contribute to a viable ESU, given the significant reductions in abundance and distribution.

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).

Status of Critical Habitats

NMFS considers the action area to be designated critical habitat for SONCC coho salmon, CC Chinook salmon, and NC steelhead.

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 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. In the coming years, climate change will influence the ability to recover coho salmon in most or all of their watersheds. 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 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 2019). 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 encompasses the entire construction footprint that would be subject to direct impacts from ground disturbance and vegetation clearing, including where staging and material storage may occur. This includes the SR 254 roadway and shoulders extending from post mile 4.16 to post mile 4.19, the access road area, impacted streambed and riparian areas, and the downstream extent of possible turbidity discharges. The action area also includes the upstream extent of anadromy because the project restores fish access to those stream reaches.

2.4. Environmental Baseline

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

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.

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

SONCC coho salmon in the action area belong to the South Fork Eel River population, which the NMFS SONCC Coho Salmon Recovery Plan indicates is at moderate risk of extinction (NMFS 2014), but is likely above the depensation threshold (which can be thought of as the number of adults needed to maintain a viable population). Chinook salmon in the action area belong to the Lower Eel/South Fork population, which the NMFS Coastal Multispecies Recovery Plan suggests is likely well below the number needed to be at a low risk of extinction (NMFS 2016). Steelhead in the action area belong to the South Fork Eel River population of NC steelhead, which is also likely well below the number needed to be at a low risk of extinction (NMFS 2016).

The condition of SONCC coho salmon, CC Chinook salmon and NC steelhead critical habitats, specifically the habitats' 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 temperature range for salmonids during the summer (Kubicek 1977, NMFS 2014). While Caltrans did not provide water temperature data for Fish Creek, NMFS assumes that the temperature is likely lower than in the mainstem river based on the presence of juvenile salmonids in the action area during summer. Therefore, Fish Creek should provide acceptable

rearing temperatures for salmonids throughout the year. Additionally, both recovery plans (NMFS 2014, 2016) indicate that primary limiting stresses include lack of channel structure and altered hydrologic function. Both of these limiting conditions are present in the project area.

The streambed immediately above the road crossing is aggraded due to the undersized culvert's impact on sediment routing efficiency. This is likely responsible for the apparent channel widening and upstream bank erosion and simplification of habitat features in the affected reach. The creek below the crossing is influenced by the backwater of the mainstem South Fork Eel River during high water. The periodic backwater effect, which tends to make the creek drop sediment load, combined with periodic high-velocity flows exiting the culvert, creates an unusual eddy/scour/deposition zone that looks somewhat like a stepped amphitheater and creates simplified habitat in the downstream reach.

High water temperatures in the South Fork Eel River during summer force juvenile salmonids residing in the mainstem to find cool water refugia. Therefore, streams like Fish Creek provide important rearing habitat for individual salmonids, many of which may have hatched in other parts of the watershed (non-natal rearing). While the currently-accessible reach of Fish Creek (below the SR 254 crossing) appears to provide adequate water quality when it is flowing, it currently lacks pool habitat and complex cover, which are important to rearing salmonids. Additionally, the reach of Fish Creek below the crossing, and the reach above the crossing where sediment has accumulated, are often dry during summer while the creek above the sediment wedge remains watered and provides cover.

Much of the watershed is privately owned and managed for timber and other agricultural products. The watershed above the project area was subjected to intense clearcutting in the 1950's and 1960's, though modern forestry practices are likely resulting in recovery from conditions created by historic logging practices (Smelser 2016).

Additionally, during a site visit in 2014, NMFS biologist Mike Kelly found stockpiled waste, including jugs of liquid, on the streambanks upstream of the project location, which apparently originated from an illicit marijuana grow (Kelly 2014, personal observation). Staff from HRSP removed the material before elevated flows could capture it. Illicit marijuana grows may draw water from the stream and reduce flows during salmonids' critical summer rearing period. Additionally, illicit grows may discharge various chemicals to the stream and associated roads and land grading may contribute fine sediment to the stream (NMFS 2014, 2016). However, we have no direct evidence of continuing illicit marijuana cultivation in the watershed.

While the immediate project area contains simplified habitat due to sediment effects described above, there are large redwood logs along the stream margins. There are also redwood trees along the banks with roots exposed that may eventually fall into the creek and provide rearing pools and cover. Additionally, there may be large logs buried under the aggraded portions of the channel that could be exposed during channel grading and future channel adjustment. The stream channels above the project area, which will be accessible to salmonids after the project is completed, are characterized by wood and boulders that form numerous pools.

Caltrans' BA (Caltrans 2022) summarizes several fish and habitat surveys. These include CDFW stream survey reports and spawner survey results (CDFW 1999, 2007), a biological monitoring report by Ross Taylor and Associates (RTA 2015), and three biological surveys conducted by Caltrans staff in 2019 and 2020. Additionally, NMFS biologist Mike Kelly walked approximately one mile upstream of the crossing on October 2, 2014 to look for fish and assess the habitat.

None of the surveys upstream of the culvert found signs of adult salmon or steelhead. However, each of the surveys by CDFW in 2007, Mike Kelly in 2014, RTA in 2015, and Caltrans in 2019 found either resident rainbow trout or juvenile steelhead upstream of the project area. These observations might indicate a resident population of rainbow trout, or may indicate that the culvert is passable to adult steelhead during certain flow conditions such as when backwater from the mainstem river may create lower velocity through the culvert. NMFS assumes that these trout are part of the listed NC steelhead DPS.

Caltrans also found four young-of-year coho salmon and approximately 15 young-of-year trout/steelhead just downstream of the culvert in 2019, and three yearling trout/steelhead downstream of the culvert in 2020. These juvenile salmonids were likely rearing as non-natal immigrants into lower Fish Creek seeking cool water refuge.

No Chinook salmon were observed in any of the surveys. However, CDFW fisheries biologists conducting summertime snorkel surveys occasionally find Chinook salmon smolts holding in cool water zones on the South Fork Eel River (Scott Monday, CDFW, personal communication). These fish are likely late outmigrants that are unable to continue downstream due to elevated water temperatures. Therefore, NMFS conservatively assumes that juvenile Chinook salmon could be present in the reach of Fish Creek below the culvert during summer.

During some of these surveys and other site visits in summer, the channel within the project area has been dry. However, on October 2, 2014, the channel in the project area was dry, while the creek upstream of the aggraded reach contained connected flow. This may indicate that the dry streambed in the project area is partly due to the aggraded sediment, which may be covering subsurface flow.

2.5. Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action (see 50 CFR 402.02). A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered the factors set forth in 50 CFR 402.17(a) and (b).

2.5.1. Stream Diversion and Fish Relocation

Data on fish relocation efforts since 2004 show most average mortality rates are below three percent for salmonids. Therefore, 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.

As detailed in section 1.3.1, Caltrans proposes to construct a temporary stream diversion in order to protect the creek from construction work. As described in section 2.4 of this opinion, fish numbers at the location vary between years, and in some years the stream is dry. Presently, the stream in the area to be dewatered lacks significant complex cover, which may allow the use of a seine and block nets to effectively "herd" some of the fish to areas downstream of the diversion footprint without the need to handle these fish. However, the length of the diversion will likely prevent most fish from being herded out. Therefore, we expect most fish will be captured using seines and dipnets, and electrofishing would be employed to capture any remaining fish.

Given the variation in habitat quantity between years due to varying streamflows, and the small dataset of fish observations presented in section 2.4.1, we make a conservative estimate of the numbers of fish that may be handled. This estimate is based on life history characteristics of the species and professional judgement about the quality and quantity of available habitat.

Therefore, NMFS conservatively estimates that up to 10 juvenile SONCC coho salmon, two juvenile CC Chinook salmon, and 20 juvenile NC steelhead may require relocation. If we apply the three-percent mortality rate (rounded up to the nearest whole number) to the total number of juvenile salmonids that we estimate could be captured and relocated, we would expect that no more than, one juvenile SONCC coho salmon, one juvenile CC Chinook salmon and one juvenile NC steelhead would be injured or killed during relocation.

2.5.2. 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 sediment and turbidity are anticipated during construction and removal of the stream diversion. Additionally, there is likely to be an increase in suspended sediment and turbidity in the project area during the first flow-producing rainfall of the season as disturbed streambed and streambank 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).

The first streamflow-producing rains of the season will likely generate turbidity due to ground disturbance, and by flows through the newly constructed channel as it adjusts. Turbidity generated by these flows will occur when the most vulnerable life stages are not present and are likely to be of short duration. Additionally, through project design and implementation of standard wet-weather BMPs, as described in detail in Caltrans' BA (Caltrans 2022) and Caltrans' 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 individual 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 adult coho salmon when in high concentration.

The new bridge will drain stormwater to each abutment away from the creek, so like the existing condition, stormwater from the road surface will be routed onto the forest floor where infiltration will aid in removing contaminants. Therefore, road related contaminants and particles will be unlikely to reach salmonid habitat in concentrations that could harm salmonids.

The new bridge will not increase the amount of traffic on this highway, so NMFS does not expect increases of road-related contaminant deposition due to the proposed action. Existing levels of roadway-type contaminants on the highway are unknown, but are likely to be well below harm thresholds in this rural area. Therefore, NMFS does not expect reductions in fitness of individual salmonids 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, such as drilling for CIDH piles, 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 and stream diversion are expected to prevent chemical contamination during construction. Given the proven minimization measures and BMPs proposed, NMFS expects the likelihood of an accidental spill of contaminants reaching a waterway at a level that would harm individual salmonids to be highly improbable.

2.5.3. Hydroacoustics

While no impact pile driving is proposed, demolition of the existing roadway and culvert, as well as vibratory installation of sheet piles used for shoring, could create sound levels that may induce behavioral responses in exposed salmonids (Caltrans 2020). However, the stream will be dewatered over a distance that we believe is sufficient to prevent exposure of fish. Therefore, we do not expect any harm to listed salmonids due to noise or vibrations.

2.5.4. Temporary Loss of In-stream Habitat

As described in Section 1.3.1 of this opinion, Caltrans will divert flow from the stream in the work area. Therefore, this reach of stream will be unavailable to rearing juvenile salmonids for one construction season.

As described in section 2.4.1, the action area appears to serve as a cool water refuge for non-natal salmonids, and may support resident rainbow trout that are part of the NC steelhead DPS. However, the structure of the project stream reach does not currently provide the cover and depths associated with high quality rearing habitat, and in some years the stream reach goes dry during the summer rearing period. Additionally, the natural stream bottom in the reach would provide salmonid food sources such as aquatic insects during periods when it is wetted.

However, given the low numbers of fish that currently use the stream reach for non-natal summer rearing, and because all salmonids observed upstream of the culvert were outside of the project reach, we believe that the small number of salmonids that may rear in the project reach will find other nearby tributary streams with adequate rearing conditions.

Therefore, the temporary loss of rearing habitat in the project reach is unlikely to reduce the survival or fitness of individual salmonids.

2.5.5. Effects to Critical Habitat

Riparian Vegetation Removal
As described in section 1.3.1, Caltrans will remove several trees and other riparian vegetation within the project footprint.

NMFS expects that the temporary loss of this riparian vegetation will have minimal impact on the functional values of existing riparian habitat given the small scale of the impact; therefore, no measurable increase in water temperature or reduction in the amount of terrestrial food input into the streams is anticipated. Additionally, two redwood trees large enough to function as LWD will be removed, but they will be used as part of the proposed instream habitat structures. Therefore, NMFS does not expect any appreciable changes to large woody debris recruitment to the river. NMFS believes that impacts to riparian vegetation will be inconsequential to the overall value of salmonid habitat in the action area, and the completed project should create improved rearing habitat conditions.

Streambanks and Streambed
Effects to individual salmonids due to temporary loss of the streambed are described in section 2.5.4. NMFS does not believe that this temporary loss will create any long-term reduction in

benthic food resources as the area should recover quickly once the reach experiences high winter flows. Impacts to the banks and riverbed will be minimized per project design and BMPs, and new LWD habitat structures will be installed. Therefore, NMFS expects that the bed and bank habitat will maintain at least the same value as a result of the proposed action.

Additionally, the new roadway will create approximately 0.03 acre of new impervious surface. Impervious surface can create higher peak flows in receiving streams during storm events, which can alter the geometry of the bed and banks over time if the percent of impervious surface in a watershed is high enough. However, the South Fork Eel River is largely rural with large areas of forest and a very low percentage of artificial impervious surface. Therefore, NMFS expects that an increase of 0.03 acre will not alter the hydrograph of Fish Creek or the South Fork Eel River in any measurable way.

Beneficial Effects
The intents of the project are to provide passage for all life stages of salmonids upstream of the SR 254 crossing, and to improve habitat conditions in the project area. Given the gradient and channel size characteristics of Fish Creek, newly accessible spawning habitat would primarily benefit steelhead, though coho and Chinook salmon may also use the stream for spawning. And based on conditions described in section 2.4.1, all three species of juvenile salmonids will likely benefit from improved access to cool water refuge and increased cover in the channel. Therefore, the project addresses high priority actions as described in the species' Recovery Plans (NMFS 2014, 2016).

2.5.6. 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 that fish may be exposed to suspended sediment, for example. 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. Because combined effects are either unlikely or of very low intensity, NMFS does not expect any reductions in fitness of individual salmonids from any combined effects of individual construction elements in the action area.

2.6. Cumulative Effects

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

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

environmental conditions in the action area are described earlier in the discussion of environmental baseline (Section 2.4).

SONCC coho salmon, CC Chinook salmon, and NC steelhead in the action area are likely to be affected by future, ongoing non-federal activities, such as timber harvest and illicit marijuana cultivation. Present timber harvest practices and associated road use and construction may contribute fine sediment to Fish Creek, and may alter the interaction of stream and forest to some degree; however, as described in section 2.4.1, the watershed is likely recovering from historic timber harvest practices even while modern timber harvest continues. Illicit marijuana cultivation with associated water withdrawals, road use, and land grading may cause diminished stream flows, chemical contamination, and fine sediment deposition in the stream (NMFS 2014, 2016).

2.7. Integration and Synthesis

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

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

We describe habitat for SONCC coho salmon, CC Chinook salmon, and NC steelhead at the ESU and DPS scale as mostly degraded in section 2.2.2. Although there are exceptions, the majority of streams and rivers in the ESU have impaired habitat. Additionally, this critical habitat often lacks the ability to establish fully functioning features due to ongoing and past human activities. While habitat generally remains degraded across the ESUs and DPS, restorative actions have likely improved the conservation value of habitat throughout their ranges.

SONCC coho salmon in the action area belong to the South Fork Eel River population, which the SONCC Coho Salmon Recovery Plan indicates is at moderate risk of extinction (NMFS 2014). Chinook salmon in the action area belong to the Lower Eel/South Fork population, which the Coastal Multispecies Recovery Plan suggests is likely well below the number needed to be at a low risk of extinction (NMFS 2016). Steelhead in the action area belong to the South Fork Eel River population of NC steelhead, which is also likely well below the number needed to be at a low risk of extinction (NMFS 2016).

As described in section 2.4, high water temperatures in the mainstem South Fork Eel River during summer force rearing juvenile salmonids to find cool water refugia. Therefore, streams like Fish Creek provide important rearing habitat for individual salmonids, many of which may have hatched in other parts of the South Fork Eel River watershed. While the currently-accessible reach of Fish Creek (below the SR 254 crossing) appears to provide adequate water quality when it is flowing, it currently lacks pool habitat and complex cover. Additionally, the

reach of Fish Creek below the crossing, and the reach above the crossing where sediment has accumulated due to restricted flow and altered sediment transport, are often dry during summer while the creek above the sediment wedge remains watered and provides cover. Therefore, the aggraded channel and barrier culvert both limit important rearing habitat conditions.

The cumulative effects of those state and private activities that occur in the South Fork Eel River watershed 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, CC Chinook salmon, and NC steelhead. Focused recovery actions, as identified in the Recovery Plans (NMFS 2014, 2016), are expected to further improve habitat in the South Fork Eel 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.

Additionally, in sections 2.4.1 and 2.6, we describe evidence of illicit marijuana cultivation in the watershed, including a stockpile of waste on the streambank that apparently included chemicals. We considered whether opening fish passage at this location could attract fish into a harmful situation. However, we do not have direct evidence that cultivation continues or is impacting the stream, and many streams in the ranges of these populations have illicit marijuana cultivation in their watersheds (NMFS 2014, 2016). We determined that the risk of opening habitat and exposing salmonids to harmful conditions is likely about the same on any stream within the boundaries of these salmonid populations, and reopening habitat is a critical measure in the conservation of these populations. Therefore, we believe that the benefits of constructing this fish passage project outweigh any perceived risk of attracting fish into a harmful situation.

2.7.2. Summary of Effects to Individual Salmonids and Critical Habitat

NMFS anticipates miniscule effects to SONCC coho salmon, CC Chinook salmon, and NC steelhead and their designated critical habitats from expected levels of hydroacoustic exposure, chemical contamination, temporary loss of riparian vegetation, disturbance of streambanks and streambed, or increased sediment and turbidity during various activities. However, adverse effects are likely due to capture, handling, and relocation efforts intended to protect fish from potential exposure to in-water work activity.

NMFS conservatively estimates that up to 10 juvenile SONCC coho salmon, two juvenile CC Chinook salmon and 20 juvenile NC steelhead may require relocation. If we apply the three-percent mortality rate (rounded up to the nearest whole number) to the numbers of juvenile salmonids that we estimate could be captured and relocated, we would expect that no more than, one juvenile SONCC coho salmon, one juvenile CC Chinook salmon, and one juvenile NC steelhead would be injured or killed during relocation.

Overall Individual and Critical Habitat Effects
NMFS does not expect that the loss of one juvenile SONCC coho salmon, one juvenile CC Chinook salmon, and one juvenile NC steelhead would affect future adult returns. This loss of juveniles would represent a miniscule percentage of the overall number of individuals in each population. The overall number of individuals in the populations will likely provide a

compensatory effect. Other areas of the South Fork Eel River watershed are expected to continue to contribute to the populations 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, the CC Chinook salmon ESU, or the NC steelhead DPS, and the project is unlikely to appreciably diminish the value of designated critical habitat for the conservation of these species.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and the cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of SONCC coho salmon, CC Chinook salmon, and NC steelhead and their designated critical habitats.

2.9. Incidental Take Statement

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

The take exemption conferred by this incidental take statement is based upon the proposed action occurring as described in section 1.3 of this opinion and in more detail in Caltrans' BA (Caltrans 2022).

2.9.1. Amount or Extent of Take

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

We expect that no more than one juvenile SONCC coho salmon, and one juvenile CC Chinook salmon, and one juvenile NC steelhead would be injured or killed during relocation, as detailed in sections 2.5.1 and 2.7.2 above.

2.9.2. Effect of the Take

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

2.9.3. Reasonable and Prudent Measures

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

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

1. Undertake measures to ensure that harm and mortality to salmonids 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

In order to be exempt from the prohibitions of section 9 of the ESA, the Federal action agency must comply with the following terms and conditions. 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. The stream diversion and fish relocation plans shall include the qualifications of biologists conducting the fish relocation.

    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 or via email to Mike.Kelly@noaa.gov. 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 any 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 implement 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:

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 (by ESU) killed or injured during Project construction; and photographs taken before, during, and after the activity from photo reference points.

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 critical habitat or regarding the development of information (50 CFR 402.02). However, the purpose of the project is to address key limiting stresses on South Fork Eel River salmonid populations as identified in the species' recovery plans (NMFS 2014, 2016); therefore, we have no additional conservation recommendations.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Fish Creek Passage Project.

Under 50 CFR 402.16(a): "Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action."

3. 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 (Pacific Fishery Management Council (PFMC) 2016) contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce.

3.1. Essential Fish Habitat Affected by the Project

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 rearing and possible spawning habitat for coho and Chinook salmon 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. There HAPCs in the action area include complex channel and floodplain habitat, spawning habitat, and thermal refugia.

3.2. Adverse Effects on Essential Fish Habitat

The potential effects to coho salmon and Chinook salmon habitat have already been described in the *Effects of the Action* section of this opinion (section 2.5). The adverse effects to EFH and HAPCs in the action area include:

1. Temporary reduction in available habitat due to the proposed stream diversion.
2. Temporary reduction in water quality caused by increase in suspended sediments and turbidity during construction, and during the first rain events following construction.
3. Temporary loss of riparian vegetation.

3.3. Essential Fish Habitat Conservation Recommendations

The purpose of the project is to address key limiting stresses on South Fork Eel River salmonid populations as identified in the species' recovery plans (NMFS 2014, 2016), and we have identified no additional practical measures that would minimize effects to EFH; therefore, we have no conservation recommendations.

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 [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 CDFW and HRSP. Individual copies of this opinion were provided to Caltrans. The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adhere to conventional standards for style.

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 part 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion and EFH consultation 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, if applicable*], and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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