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

June 18, 2024 **Refer to NMFS No:** WCRO-2023-02284

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

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Wilderness Lodge Road over Dutch Charlie Creek Bridge Replacement Project (BRLO 5910(091))

Dear Mr. Cardiff:

Thank you for the California Department of Transportation's (Caltrans)[1] letter dated April 24, 2023, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Wilderness Lodge Road over Dutch Charlie Creek Bridge Replacement Project (BRLO 5910(091)). Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act [16 U.S.C. 1855(b)] for this action.

The enclosed biological opinion describes NMFS' analysis of effects on individual threatened California Coastal (CC) Chinook salmon (*Oncorhynchus tshawytscha*), threatened Northern California (NC) steelhead (*Oncorhynchus mykiss*), threatened Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), 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 Evolutionarily Significant Unit (ESU), the CC Chinook salmon ESU, or the NC steelhead Distinct Population Segment (DPS), 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.

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[1] Caltrans is acting as the lead agency for ESA Section 7(a)(2) and MSA Section 305(b) formal consultation under National Environmental Policy Act Assignment from Federal Highway Administration (327 Memorandum of Understanding (MOU) 2022 and 326 MOU 2022). As assigned by the MOUs, Caltrans is responsible for the environmental review, consultation and coordination on this project.

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

Please contact Elena Meza of the NMFS North-Central Coast Office in Santa Rosa, California at (707) 583-3830, or elena.meza@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Christa Unger, Caltrans District 1, Eureka CA, christa.unger@dot.ca.gov
Vincent Heim, Caltrans District 1, Eureka CA, vincent.heim@dot.ca.gov
James Linderman, Mendocino County, CA, lindermanj@mendocinocounty.gov
e-file FRN 151422WCR2023SR00200

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

Wilderness Lodge Road Over Dutch Charlie Creek Bridge Replacement Project

NMFS Consultation Number: WCRO-2023-02284
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	Yes	No
California Coastal (CC) Chinook salmon (*O. tshawytscha*)	Threatened	Yes	No	Yes	No
Northern California (NC) Steelhead (*O. mykiss*)	Threatened	Yes	No	Yes	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: June 18, 2024

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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 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 in Santa Rosa.

1.2. Consultation History

An agency meeting was conducted on-site on April 29, 2016 to discuss the proposed Project design and potential construction methods. Darren Howe of NMFS Santa Rosa attended the meeting and provided regulatory guidance, including appropriate work windows to avoid the spawning migration period of federally listed salmonids. Tom Daughtery, NMFS biologist, provided technical assistance in November 2019, August 2020, and September 2020.

Technical assistance continued with NMFS Caltrans Liaison Andrew Trent with early review of the Project Biological Assessment starting in November, 2021. NMFS requested additional information regarding stormwater treatment for the project via email in April, 2022. Caltrans responded in January, 2023 with additions to the BA to include design elements for conveying stormwater into bioswales. NMFS, CDFW, and Caltrans had discussions regarding salmonid take for the project, especially coho salmon in January – February, 2023.

On September 14, 2023 NMFS received an email from Caltrans that included: 1) a letter requesting initiation of section 7 consultation for potential impacts on SONCC coho salmon, CC Chinook salmon, and NC steelhead and their designated critical habitats; and 2) the August 2023 Biological Assessment (BA) for the Wilderness Lodge Road over Dutch Charlie Creek Bridge Replacement Project (BRLO 5910 (091)). This package included sufficient information to initiate consultation for the Project and Caltrans was notified of this initiation date via email on the same day.

Given the September 14, 2023 initiation date, this consultation was due to Caltrans on January 27, 2024, but work on this consultation was paused in October 2023 due to staff shortages. On February 28, 2024, NMFS requested an extension to the original due date via email. On February 29, 2024, Caltrans agreed to an extended due date of May 15, 2024 to complete the consultation. Upon hiring new staff in March 2023, it was decided that an additional extension would be appropriate to complete the consultation. On April 4, 2024 NMFS requested an additional extension via email, and on this same date via email Caltrans agreed to extend the due date for the consultation to June 7, 2024. On May 9, 2024, a final extension was requested via email and on this same date, Caltrans agreed to an extended due date of June 18, 2024.

On May 29, 2024 a field visit was conducted to clarify the area proposed for dewatering, diversion, and fish handling. In addition, the area was observed to discern current habitat conditions following winter storms. The following participants were present: Vincent Heim and Steven Hansen from Caltrans, James Linderman and Josie Slovut from Mendocino County Department of Transportation, and Elena Meza from NMFS.

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on May 6, 2024 (89 Fed. Reg. 24268). We are applying the updated regulations to this consultation. The 2024 regulatory changes, like those from 2019, were intended to improve and clarify the consultation process, and, with one exception from 2024 (offsetting reasonable and prudent measures), were not intended to result in changes to the Services' existing practices in implementing section 7(a)(2) of the Act. 89 Fed. Reg. at 24268; 84 Fed. Reg. at 45015. We have considered the prior rules and affirm that the substantive analysis and conclusions articulated in this biological opinion and incidental take statement would not have been any different under the 2019 regulations or pre-2019 regulations.

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).

The County of Mendocino (County), in cooperation with Caltrans and the FHWA, proposes to replace the Dutch Charlie Creek Bridge at Wilderness Lodge Road (also known as Jack of Hearts Road) to provide the public with a new bridge that will meet current design standards, improve driver safety, and be consistent with Caltrans and American Association of State Highway and Transportation Officials guidelines. The existing bridge crosses Dutch Charlie Creek on a perpendicular alignment, and the proposed new bridge will be built along the same alignment. The Wilderness Lodge Road Bridge at Dutch Charlie Creek is located approximately 9 air miles west of the Town of Laytonville in unincorporated Mendocino County. The Project will take place on Wilderness Lodge Road where it crosses Dutch Charlie Creek (Figure 1). The existing Dutch Charlie Bridge was constructed in 1969 and is approximately 40 feet long and 22 feet wide (0.18 acres). The current bridge is comprised of two railroad flatcars with a timber deck, it does not support two lanes of traffic, is weight-restricted to a single through lane, and does not provide sufficient freeboard for the 50- and 100-year flood events. The proposed replacement bridge will be a single-span cast-in-place prestressed concrete slab bridge approximately 60 feet long and 24 feet wide (0.30 acres), will support two 10-foot lanes of traffic and two 2-foot shoulders, and will be raised by two feet to pass a 50-year flood event. The new bridge will be supported on spread footings on rock to support the abutments, and will not need to be protected from scour as the abutment foundations will be founded on non-scourable rock material. To improve channel restriction and restore more natural channel form and function, the proposed new abutments will be placed outside of the active channel and the ordinary high-water mark (OHWM) of the creek (Appendix A). Following completion of the proposed new bridge, stormwater will drain into two bioswales north of the bridge, one on each side of the roadway near the ends of the wingwalls as the bridge deck is designed to slope down from south to north. Due to the steep topography, the bioswales will be built with alternative vegetated bioswales and riprap check dams for grade control to prevent erosion (Appendix B). The project will result in 0.12 acres of permanent impacts to the creek channel resulting from the increased width of the new bridge structure.

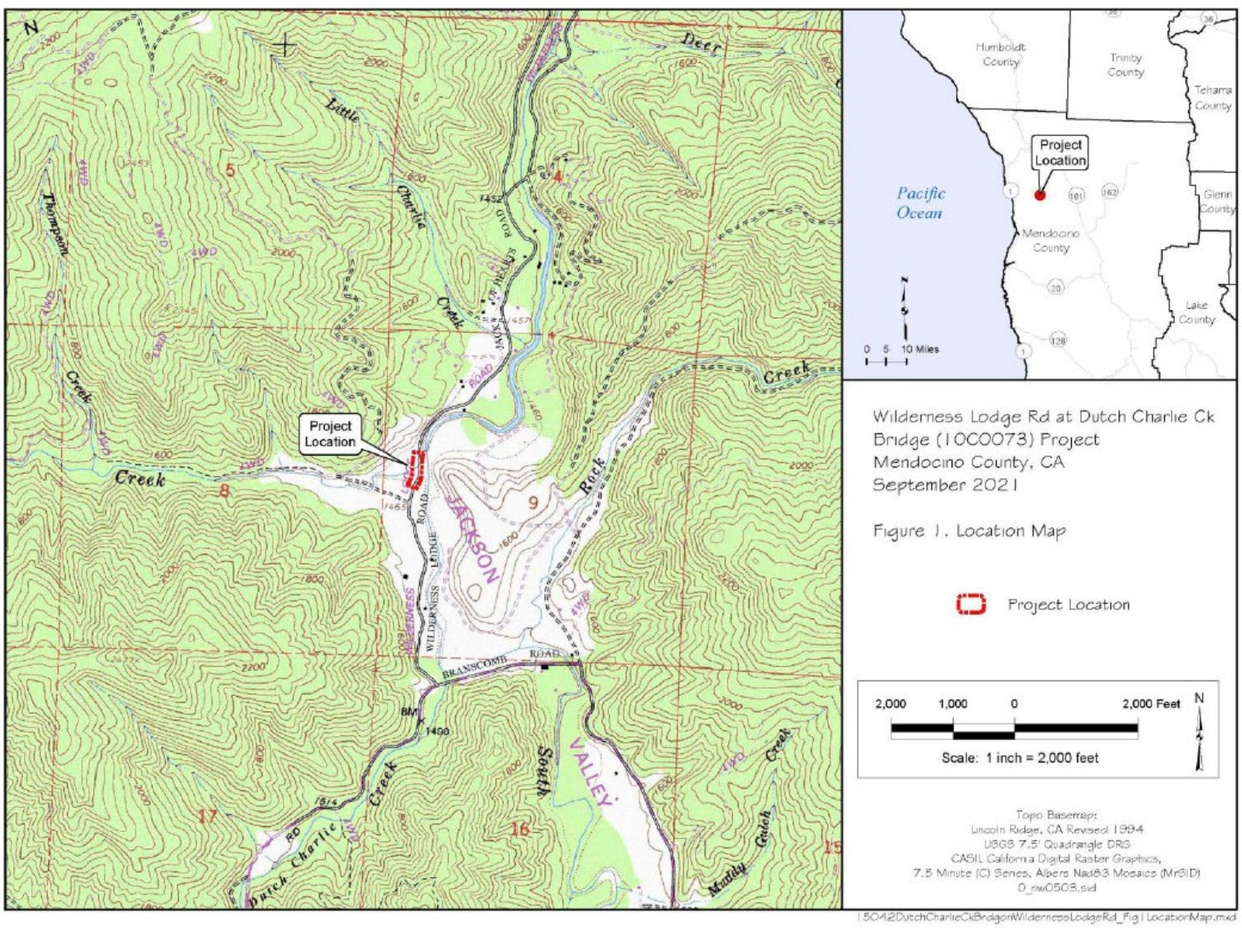

Figure 1 Project Location within Mendocino County

The Dutch Charlie Bridge is the only access to properties north of the creek, and traffic access will need to be maintained during construction. To facilitate traffic flow during construction a temporary bridge east of the existing structure (upstream) will be constructed. The temporary bridge will span the creek and all construction will occur above the ordinary high-water mark (OHWM). To facilitate construction of the temporary bridge, the area will be cleared and grubbed of vegetation. Approximately 0.038 acre of red alder riparian forest will be temporarily impacted including removal of five red alders (dbh ≤10 inches) along the banks of Dutch Charlie Creek, and above the OHWM (Appendix B). Following vegetation removal, geotextile fabric will be laid out to protect habitat below. The temporary abutments used to support the temporary bridge will be constructed outside of the channel, and the temporary bridge superstructure will be placed on the abutments using a crane. Once in place, the superstructure will be paved with asphalt concrete. The temporary bridge will serve as a traffic detour, and for staging and access. In addition to the temporary bridge, staging and access areas will also be located along both sides of Wilderness Lodge Road north and south of the existing bridge. Following completion of the project, all temporary construction areas will be revegetated.

Once the temporary bridge is in place and traffic is diverted, demolition of the existing bridge will occur. The stream banks of Dutch Charlie Creek will be excavated to facilitate removal of the existing bridge abutments and footings. Removal of the abutments and footings will occur to a depth of approximately 3 feet below finished grade, and will be completed using excavators affixed with hydraulic hammers. Any voids left from removal of the abutments will be backfilled and recontoured to match the natural grade of the creek bed. Cranes will be stationed on the roadway approaches and will be used remove the bridge superstructure. All bridge and abutment debris will be removed from the project site and properly disposed of offsite, unless otherwise salvaged by the County. To facilitate construction of the new bridge, falsework will be constructed across the stream from abutment to abutment. The falsework may include columns supported on the streambed with pads to distribute the weight of the concrete bridge deck. Once falsework is constructed the bridge concrete will be placed. Concrete trucks and other equipment will be stationed on the existing road, adjacent to the construction area. When the concrete is sufficiently cured, the falsework will be removed. Following construction of the proposed new bridge, the temporary bridge and abutments will be removed.

Access to the creek bed is needed to remove the existing bridge, and for construction, and subsequent removal, of falsework for the new bridge. While instream construction will be conducted during the dry season when flows are at annual lows (June 15 to October 15), a creek diversion will be necessary. To gain access, water will be diverted around the work area using a series of pipes and cofferdams up- and downstream of the area to be dewatered. Flows will be bypassed through the area by funneling flows with clean plastic sheeting through temporary culverts; temporary culverts will remain in place during in-channel construction to maintain fish passage and bypass flows through the work area. To facilitate a dry work area, it may also be necessary to utilize dewatering trenches and/or sump pumps. Once the area is dried, protective covers (e.g., plastic sheeting) will be placed over the area to prevent debris from falling into the creek bed. A maximum of 48 linear feet of Dutch Charlie Creek will be diverted/dewatered to complete the project, totaling an area of 1,152 square feet proposed for dewatering.[2] Construction is expected to be completed in one season with one dewatering event. Juvenile NC steelhead, CC Chinook salmon, and SONCC coho salmon, if present in the work area, will be collected, relocated, and/or excluded from the area prior to dewatering the work site.

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[2] This area was calculated using the maximum length of creek proposed for dewatering multiplied by the width of the creek (24 feet) within this reach of Dutch Charlie Creek: 48 feet * 24 feet = 1,152 square feet.

Heavy equipment will be used during construction activities and may include any combination of the following: excavator hydraulic breaker, hoe rams, front-end loader, bulldozer, crane, dump trucks, concrete trucks, grader, off road forklift, service trucks and vehicles, asphalt paver, roller, generator set, signal boards, and rubber-tired backhoes.

Caltrans proposes to include several avoidance and minimization measures (AMM) that will be implemented before, during, and after construction to prevent and minimize project-related effects to NC steelhead, CC Chinook salmon, and SONCC coho salmon and surrounding habitat. These measures include working within the in-water work window of June 15 to October 15; ensuring proper handling and relocation of listed salmonids during dewatering/diverting and fish exclusion activities; ensuring establishment of revegetation areas; preventing introduction of contaminants into waterways; ensuring complete removal and proper disposal of all construction waste; implementing erosion control measures; development of a fish handling and relocation plan, a habitat restoration and revegetation plan, a stormwater pollution prevention plan (SWPPP), and a storm water management plan (SWMP). A detailed list of the AMMs and additional best management practices (BMPs) are described in Caltrans' biological assessment (2023).

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

1.3.1. California Endangered Species Act Conformance

A Section 2080.1 consistency determination for CCC coho salmon from the California Department of Fish and Wildlife (CDFW) will be requested for this project. In order for CDFW to issue a consistency determination, Caltrans proposes to provide security, in compliance with the Master Funding Agreement entered into by the CDFW and Caltrans on September 3, 2021, to ensure that it has adequate funding to complete the mitigation measures. Prior to construction, Caltrans will create a separate project identified by a new expenditure authorization number for the principal purpose of funding security for mitigation and associated monitoring and adaptive management requirements, referred to as a Child EA mitigation project. Caltrans would submit documentation to CDFW to show that sufficient funds have been allocated in the Child EA mitigation project to ensure implementation of all measures to minimize and fully mitigate the incidental take of state-listed species resulting from construction of the proposed project.

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

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

2.1. Analytical Approach

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

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

The designation(s) of critical habitat for 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 range wide 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.

To conduct the assessment presented in this opinion, NMFS examined information from a variety of sources. Detailed background information on the biology and status of the listed species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. Additional information regarding the potential effects of the proposed activities at the Dutch Charlie Creek Bridge Replacement Project on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was formulated from the aforementioned resources, and Caltrans' 2023 biological assessment: Wilderness Lodge Road over Dutch Charlie Creek Bridge Replacement Project Biological Assessment (BRLO 5910(091)).

2.2. Rangewide Status of the Species and Critical Habitat

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

The opinion analyzes the effects of the proposed action on the following listed species ESU or DPS and designated critical habitat:

Southern Oregon/Northern California Coast coho salmon
Threatened (70 Fed. Reg. 37160, June 28, 2005)
Critical Habitat Designation (64 Fed. Reg. 24049, May 5, 1999

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

Northern California steelhead
Threatened (71 FR 834; January 5, 2006.)
Critical Habitat Designation (70 FR 52488, September 2, 2005)

2.2.1. <u>SONCC Coho Salmon</u>

SONCC coho salmon includes 40 populations of coho salmon in coastal streams form the Elk River near Cape Blanco, Oregon and California, through and including the Mattole River near

Punta Gorda, California. Spanning Oregon and California, SONCC coho salmon can be found in 13 counties, Coos, Douglas, Curry, Josephine, Jackson, Klamath, Del Norte, Siskiyou, Humboldt, Trinity, Mendocino, Lake, and Glen.

Although long-term data on SONCC 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, 24 of the 31 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 population.

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. However, extirpation, 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. The most recent status review reaffirmed the ESU's threatened status (NMFS 2016).

Interior-Eel Diversity Stratum. There is a population-level estimate of adult abundance for one of the three independent populations in this stratum (CDFW 2020). The nine-year time series of the South Fork Eel River independent population has averaged 1,233 redds per year. Although a negative trend, the 95 percent confidence interval includes zero. Methods for expanding these redd counts to population estimates have not yet been developed. Assuming an average spawner:redd ratio of 2:1, this average equates to approximately 2,446 adult coho salmon, 26 percent of the recovery target of 9,300 adults and categorizing this population at moderate extinction risk.

2.2.2. <u>CC Chinook Salmon</u>

The CC Chinook salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River, in Humboldt County, to the Russian River. Seven artificial propagation programs were considered part of the ESU at the time of listing: the Humboldt Fish Action Council (Freshwater Creek), Yager Creek, Redwood Creek, Hollow Tree, Van Arsdale Fish Station, Mattole Salmon Group, and Mad River Hatchery fall-run Chinook hatchery programs.

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

Data on CC Chinook salmon abundance, both historical and current, is sparse and of varying quality (Bjorkstedt *et al.* 2005). Estimates of absolute abundance are not available for populations in this ESU (Myers *et al.* 1998). In 1965, CDFG (1965) estimated escapement for this ESU at over 76,000. Most were in the Eel River (55,500), with smaller populations in Redwood Creek (5,000), Mad River (5,000), Mattole River (5,000), Russian River (500), and several smaller streams in Humboldt County (Myers *et al.* 1998). Between 2000 and 2020, the average number of adults Chinook salmon counted at Mirabel Dam on the Russian River was 2,716 fish (no data was obtained in 2014 and 2015) (SCWA website 2021).

CC Chinook salmon populations remain widely distributed throughout much of the ESU. Notable exception includes the area between the Navarro River and Russian River and the area between the Mattole and Ten Mile River populations (Lost Coast area). Concerns regarding the lack of population-level estimates of abundance, the loss of populations from one diversity stratum, as well as 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). The most recent status review describes the discovery of spawning adults in several smaller, coastal Mendocino County tributaries where they had not been previously documented, which suggests ESU spatial diversity is likely better than previously thought (NMFS 2016a). The same status review reaffirmed the ESU's threatened status (NMFS 2016a).

North Coastal Stratum Estimates of CC Chinook salmon redds have been made for the last nine years in the South Fork Eel River. These surveys have taken place in a coho salmon sampling frame and so do not include portions of the mainstem South Fork Eel River downstream of Branscomb, which are too large to safely or effectively sample during most winters. The average estimate has been 768 (range 68-1829) during this period, with no statistically significant trend ($p = 0.709$). A sonar camera has also been operated in the South Fork Eel River since the 2018-2019 spawning season, and estimates indicate that Chinook salmon numbers were in the low thousands in the first two years of operation. However, these counts have assumed all fish observed in November and December are Chinook salmon, when it is known from spawning ground surveys that appreciable numbers of coho salmon are also entering the river prior to January; thus, the reported estimates are considered provisional.

2.2.3. NC Steelhead

Historically, the NC steelhead DPS consisted of 38 independent populations (16 functionally and 22 potentially independent) of winter run steelhead and ten functionally independent populations of summer run steelhead (Spence *et al.* 2012). In the NC steelhead DPS, summer-run steelhead populations historically persist in as many as ten populations with extant populations including the Mad River, Eel River (South Fork, Van Duzen, Upper Mainstem, Middle Fork), Mattole River, and Redwood Creek (Spence *et al.* 2008).

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 appreciate 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 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, Van Duzen), 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).

Northern Coastal Stratum. Implementation of the California Coastal Monitoring Plan (CMP) for winter-run steelhead has continued for four populations in the Norther Coastal Stratum: Redwood Creek, Humboldt Bay, the South Fork Eel River, and Mattole River. There efforts have produced estimates of total redd numbers in each of these waters for the past 6 to 9 years. Methods for expanding red counts to population estimates have not yet been developed. For the South Fork Eel River, redd estimates have averaged 551 (range 5 – 1,125) over the last 9 years, with a negative but non-significant trend ($p = 0.22$).

2.2.4. Status of Critical Habitat

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

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

PBFs for CC Chinook salmon and NC steelhead critical habitat, and their associated essential features within freshwater include: 1) freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; 2) freshwater rearing sites with: water quality and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; 3) natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks, and 4) freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adults mobility and survival.

The condition of SONCC coho salmon, CC Chinook salmon, and NC steelhead critical habitat, specifically its ability to provide for conservation, has been degraded from conditions known to support viable salmonid populations. NMFS's recovery plans for these species describe how the currently depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat: logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation) (NMFS 2014, NMFS 2016b). Impacts of concern include altered stream bank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality, lost riparian vegetation, and increased erosion into streams from upland areas (Weitkamp *et al.* 1995; Busby *et al.* 1996). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESU/DPSs. As identified in the NMFS recovery plans for these species, altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

2.2.5. Additional Threats to Listed Species and Critical Habitat

2.2.5.1 Climate Change

Another factor affecting the range wide status of SONCC coho salmon, CC Chinook salmon and NC steelhead, and aquatic habitat at large, is climate change. Recent work by the NMFS science Centers ranked the relative vulnerability of west-coast salmonids and steelhead to climate change. In California, listed coho and Chinook salmon are generally at greater risk (high to very high risk) than listed steelhead (moderate to high risk) (Crozier *et al* 2019).

Impacts from global climate change are already occurring in California. For example, average air temperatures, heat extremes, and sea level increased in California over the last century (Kadir *et al*. 2013). Snowmelt from the Sierra Nevada has declined (Kadir *et al.* 2013). Although SONCC coho salmon, CC Chinook salmon, and NC steelhead are not dependent on snowmelt driven streams, they had likely already experienced some detrimental impacts from climate change through lower and more variable stream flows, warmer temperatures, and changes in ocean conditions. California has a history of episodic droughts. However, the state has experienced a two-decade period of persistently warm and dry condition. The five-year period from 2012 to 2016 was the driest since record keeping began (Williams *et al.* 2016). California entered another period of drought in 2020. These drought periods are now likely part of a larger drought event (Williams *et al*. 2022). This recent long-term drought, as well as the increased incidence and magnitude of wildfires in California, have likely been exacerbated by climate change (Williams *et al.* 2020, Williams *et al.* 2022, Diffenbaugh *et al*. 2015, Williams *et al*. 2019).

The threat to these listed salmonids from global climate change is expected to increase in the future. Modeling of climate change impacts in California suggests that average summer air temperatures are expected to continue to increase (Lindley *et al*. 2007; Moser *et al*. 2012). Heat waves are expected to occur more often, and hear wave temperatures are more likely to be higher (Hayhoe *et al*. 2004; Moser *et al*. 2012; Kadir *et al.* 2013). Total precipitation in California may decline and the magnitude and frequency of dry years may increase (Lindley *et al*. 2007; Schneider 2007; Moser *et al*. 2012). Similarly, wildfires are expected to increase in frequency and magnitude (Westerling *et al.* 2011; Moser *et al.* 2012). Increases in wide year-to-year variation in precipitation amounts (droughts and floods) are projected to occur (Swain *et al.* 2018). Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia *et al.* 2002; Ruggiero *et al.* 2010).

In marine environments, ecosystems and habitats important to juvenile and adult salmonids are likely to experience changes in temperatures, circulation, water chemistry, and food supplies (Brewer and Barry 2008; Feely 2004; Osgood 2008; Turley 2008; Abdul-Aziz *et al.* 2011; Doney *et al*. 2012). Some of these changes, including increased incidence of marine heat waves, are likely already occurring, and are expected to increase (Frolicher *et al.* 2018). In fall 2014, and again in 2019, a marine heatwave, known as "The Blob" formed throughout the northeast Pacific Ocean, which greatly affected water temperature and upwelling from the Bering Sea off Alaska, south to the coastline of Mexico. The marine waters in this region of the ocean are utilized by salmonids for foraging as they mature (Beamish 2018). Although the implications of these events on salmonid populations are not fully understood, they are having considerable adverse consequences to the productivity of these ecosystems and presumably contributing to poor marine survival salmonids. The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007; Santer et al. 2011).

2.2.5.2 Water Quality

Recently published work has identified stormwater from roadways and streets as causing mortality of adult coho salmon in the wild (Scholz *et al.* 2011) and laboratory settings (McIntyre *et al.* 2018). Subsequent laboratory studies show this mortality also occurred in juvenile coho salmon (Chow *et al*. 2019) as well as juvenile steelhead and Chinook salmon (Brinkmann *et al.* 2022). These recent publications have identified a degradation product of tires (6PPD-quinone) as the causal factor in this mortality (Tian *et al.* 2022, Brinkmann *et al.* 2022, Tian *et al.* 2020; Peter *et al*. 2018). The parent compound (6PPD) is widely used by multiple tire manufacturers and the tire shreds/dust that produce the degradation product have been found to be ubiquitous where both rural and urban roadways drain into waterways (Feist *et al*. 2018, Sutton *et al.* 2019).

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 streambed and banks of Dutch Charlie Creek where the existing bridge crosses the creek[3], the roadway associated with road improvements, bridge approaches, temporary detour bridge, areas needed for staging and access, and the areas up- and downstream of the bridge proposed to be

[3] Latitude/Longitude: 39.689508°/-123.659185°

dewatered, and approximately 100 linear feet of the creek down stream of the dewatered area where temporary construction effects may occur.

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 impacts to listed species or designated critical habitat from federal agency activities or existing federal agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

2.4.1. Status of SONCC Coho Salmon, NC Steelhead, and CC Chinook salmon and Critical Habitat in the Action Area

Sprehn and Clark (1979) documented coho salmon spawning in Dutch Charlie Creek in 1979 and Brown and Moyle (1991) confirmed their presence in their statewide survey. A 2007 habitat survey (Pacific States Marine Fisheries Commission 2008) provided evidence that coho salmon juveniles were present and outnumbered steelhead trout. Garwood (2012) documented evidence of at least 12 years where different size classes of coho salmon were present in Dutch Charlie Creek from 1958 to 2002, and CDFW (2012) produced a coho salmon presence electronic map (ArcGIS theme) to support NMFS (2014) recovery planning. CDFW conducted surveys from November 2017 through January 2018 for the South Fork Eel River Coho Redd Abundance Monitoring Project (CDFW 2018a). Coho salmon were observed in Dutch Charlie Creek on January 8, 2018 upstream of the Action Area.

Field surveys associated with this Project found coho salmon YOY to be present on April 29, 2016 downstream of the Action Area (Higgins 2016). A more extensive dive survey on May 18, 2016 found coho salmon were the most abundant salmonid species present, both above and below the Action Area. Juveniles were observed in pools formed by large wood and run habitats that were greater than 2 feet deep with good cover; they were not found in riffles. Two size classes of coho salmon juveniles, 40 to 45 millimeters and 50 to 55 millimeters long, suggested successful spawning spanning from early December 2015 into January and February 2016. Independent surveys by Patrick Higgins on September 24, 2021, a drought year, found YOY coho salmon in larger pools below Wilderness Lodge Road in Dutch Charlie Creek (Higgins 2021). A second independent survey by Patrick Higgins on July 19, 2023, a high flow year, found YOY and also yearling coho salmon in larger pools below Wilderness Lodge Road in Dutch Charlie Creek (Higgins 2023).

NC steelhead trout were present at the action area during all 2016 field visits, including during direct dive observations on April 29, and May 18. 2016 (Higgins 2016). In the first visit that covered only the reach of Dutch Charlie Creek between the action area and the confluence with the South Fork Eel River, coho salmon were present but steelhead were not. In a more extensive survey of 1,250 feet of the stream above and below the Project on May 18, steelhead YOY and yearling steelhead were present but with coho salmon juveniles outnumbering them. Deeper habitats surveyed on May 18 were spot checked in the same reach. Steelhead were the dominant species present, including two size classes of YOY, indicating some late emergence from spring spawning adults and also yearlings (100 mm). Colder water was notable emerging from the substrate of the stream indicating hyporheic connection, but food delivery of aquatic insects was probably limiting salmonid production due to very low flows. An independent survey by Patrick Higgins on July 19, 2023 (high flow year), below Wilderness Lodge Road in Dutch Charlie Creek found both YOY and yearling steelhead (Higgins 2023).

Fall Chinook salmon are known to spawn in the upper South Fork Eel River in the vicinity of the town of Branscomb, upstream of Dutch Charlie Creek (Higgins 2013) and a juvenile Chinook salmon was identified in Dutch Charlie Creek itself on May 18, 2016. CDFW conducted surveys from November 2017 through January 2018 for the South Fork Eel River Coho Redd Abundance Monitoring Project (CDFW 2018a). Chinook salmon were observed in Dutch Charlie Creek on December 11, 2017 upstream of the action area. One YOY Chinook salmon was present in Dutch Charlie Creek on May 18, 2016 at the head of the large pool just downstream of the action area. This may be indicative of spawning in the creek in December 2015 or January 2016, when flows were robust. However, since the juvenile Chinook salmon was within 150 feet of the South Fork Eel River, it may also be possible that the juvenile was a result of main South Fork Eel River spawning and had entered Dutch Charlie Creek because it was attracted by cold water. Even if the fish was hatched in Dutch Charlie Creek, it was likely migrating downstream at the time of observation and headed for the estuary.

The number of juvenile coho and steelhead that may be present in the action area is difficult to predict with much confidence due to the dynamic nature of the stream reach in question, and could be highly variable. As determined by a combination of data assessment from Higgins (2013, 2016, 2018, 2021), and professional opinion, coho and steelhead abundance in the action area could range from 0.05-0.12 fish per square foot. Despite Higgins (2016) encountering only one Chinook during the May survey, and that most juvenile Chinook migrate to estuarine or marine environments by June 15th of each year, low numbers of juvenile Chinook may be rearing in the action area during the summer work window. Based on the above, NMFS expects that the action area has habitat conditions that are adequate to support juvenile salmonids and steelhead during the proposed in-water work window (June 15 – October 15).

The action area is relatively flat, and the banks of Dutch Charlie Creek are gentle to moderately sloped, and runoff in the action area primarily drains to Dutch Charlie Creek. Dutch Charlie Creek is a perennial stream that flows east through the action area, discharging into the South Fork Eel River approximately 200 feet from the existing bridge and outside of the action area. The width of Dutch Charlie Creek varies between approximately 11 feet wide at the narrowest on the west side of the action area, to approximately 36 feet wide on the east side of Wilderness Lodge Road adjacent to the existing bridge. The average width of Dutch Charlie Creek is approximately 20.8 feet. The headwaters of Dutch Creek are spread throughout the 4.3-square-mile basin to the west of the action area. The furthermost reach originates approximately 2.5 air miles west of the action area. The action area is located within Elder Creek-South Fork Eel River

Dutch watershed. Temperatures within Dutch Charlie Creek, as measured just downstream of the bridge during April to October, were shown to fall within the range of habitat suitability for coho salmon (Caltrans 2023).

Caltrans' biological assessment (2023) states that "high winter flows in 2017 had rejuvenated the channel causing the pool habitat downstream of the Wilderness Lodge Road to enlarge. The bed also appears to have become coarser due to bedload transport, leaving optimal spawning substrate for salmon, steelhead, and lamprey." The biological assessment (2023) also states that the habitat is suitable for rearing in the action area, and that coho and steelhead were noted in surveys conducted in May 2016, August 2016, and June 2017. Recent heavy rains in the winter of 2022-2024 have likely changed the habitat within the action area again, creating improved habitat conditions and likely drawing fish into the system to spawn. During a field visit in May 2024, several riffles were found within the action area, in addition to a deep pool. Up- and downstream of the bridge, there were undercut banks, large rocks and aquatic vegetation that provided additional shaded areas and cover. The creek bed was comprised of larger cobbles with dispersed aquatic vegetation (i.e., alder recruits). Approximately fifty feet upstream of the bridge was a large (dead) root wad that provided cover, undercut banks, forage habitat, and shaded pool habitat. The upstream end of the creek also showed some dynamic braiding with two channels exhibiting varying velocities. During this field visit, several fingerlings were observed in the area immediately below the bridge and immediately downstream.

Vegetation in the action area consists of redwood forest, red alder riparian forest, slough sedge swards, shrubland, and naturalized annual and native perennial grassland. Red alder riparian forest borders both sides of Dutch Charlie Creek and along the east side of Wilderness Lodge Road, south of the creek. Slough sedge swards occur just south of Dutch Charlie Creek, on the west side of Wilderness Lodge Road. A large patch of redwood forest is located on the western side of Wilderness Lodge Road on the north side of Dutch Charlie Creek. The riparian forest borders both sides of Dutch Charlie Creek and the floodplain near the confluence with the South Fork Eel River, located along the east side of Wilderness Lodge Road and south of the creek. Along the north east side of the road, and affixed to several of the trees within this stand, were remnants of cable and several segments of chain link fence that have since fallen into the creek just downstream of the bridge.

2.4.2. Climate Change in the Action Area

As described above in the Status of the Species and Critical Habitat section of this opinion (Section 2.2.4.1), climate change poses a threat to salmonid populations in central California. In the San Francisco Bay region, warm temperatures generally occur in July and August, but with climate change these events will likely begin in June and could continue through September (Cayan et al. 2012). Climate simulation models indicate the San Francisco region will maintain its Mediterranean climate regime for the 21st century; however, these models predict a high degree of variability in annual precipitation through at least 2050, leaving the region susceptible to drought (Cayan et al. 2012). These models of future precipitation suggest that, during the second half of the 21st century in this region, most years will be drier than the historical annual average (1950-1999). As noted above in Section 2.2.4.1, California is currently experiencing drought conditions which have likely been exacerbated by climate change (Williams et al. 2020, Williams et al. 2022, Diffenbaugh et al. 2015, Williams et al. 2019).

The threat of climate change to listed coho salmon, Chinook salmon, and steelhead will likely be lower in the northern coastal sections of the action area due to the fog zone and benefits of old growth redwood forests, including shady, complex stream and riparian areas, and cool stream temperatures (NMFS 2014, NMFS 2016a). Climate change will impact forests of the western U.S., which dominate the landscape of many watersheds in the region. Forests are already showing evidence of increased drought severity, forest fire, and insect outbreak (Halofsky et al. 2020). Additionally, climate change will affect tree reproduction, growth, and phenology, which will lead to spatial shifts in vegetation. Halofsky et al. (2018) projected that the largest changes will occur at low- and high-elevation forests, with expansion of low-elevation dry forests and diminishing high-elevation cold forests and subalpine habitats.

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 but that are not part of the 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 402.02).

The Rangewide Status of Species and Critical Habitat (section 2.2), describes the status of listed salmonids affected by the proposed action (SONCC coho salmon, CC Chinook salmon, and NC steelhead), as well as the status of designated critical habitat for these species. NMFS expects implementation of the proposed action to cause adverse effects to limited numbers of individual juvenile SONCC coho salmon, CC Chinook salmon, and NC steelhead. The construction season (June 15 – October 15) is designed to avoid the migratory periods of adult salmonids and steelhead. Therefore, no adverse effects to adult salmonids and steelhead are anticipated.

Construction activities, both during and post-project completion, associated with the proposed project may affect SONCC coho salmon, CC Chinook salmon, and NC steelhead and their designated critical habitat. The following may result from construction activities: unintentional direct injury or mortality during fish collection, relocation, and dewatering activities; loss of benthic habitat; increases in suspended sediments and turbidity; reduction in riparian vegetation and cover; increases in shade, hazardous materials and contaminants from heavy machinery and construction materials; stormwater runoff; and altered channel morphology. Project effects are described in more detail below.

2.5.1. <u>Fish Collection and Relocation</u>

To facilitate completion of the project, portions of Dutch Charlie Creek will need to be dewatered. As discussed above, a maximum amount of 48 linear feet will be dewatered during one construction season. The County proposes to collect and relocate fish in the 48-linear-foot area prior to, and during dewatering, to avoid fish stranding and exposure to construction activities. Before, and during dewatering of the construction site, juvenile salmonids will be captured by a qualified biologist using one or more of the following methods: dip net, seine, thrown net, block net, minnow trap, and electrofishing. Collected salmonids will be relocated to an appropriate stream reach that will minimize impacts to captured fish, and to fish that are already residing at the release site(s). Since construction is scheduled to occur between June 15 and October 15, relocation activities will occur during the summer low-flow period after emigrating smolts have left and before adults have immigrated for spawning. Only juvenile salmonids are expected to be in the action area during the construction period. Therefore, NMFS expects capture and relocation of listed salmonids will be limited to pre-smolting and YOY juveniles.

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

Relocated fish may also have to compete with other fish, causing increased competition for available resources such as food and habitat. To reduce the potential for competition, fish relocation sites will be pre-approved by NMFS to ensure the sites have adequate habitat to allow for survival of transported fish and fish already present. Nonetheless, crowding could occur which would likely result in increased inter- and intraspecific competition at those sites. Responses to crowding by salmonids include self-thinning, resulting in emigration and reduced salmonid abundance with increased individual body size within the group, and/or increased competition (Keeley 2003). Relocation sites will be selected to ensure they have similar water temperatures as the capture sites, and adequate habitat to allow for survival of transported fish and fish already present. However, some of the fish released at the relocation sites may choose not to remain in these areas and move either upstream or downstream to areas that have more vacant habitat and a lower density of fish. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. In some instances, relocated fish may endure some short-term stress from crowding at the relocation sites. Such stress is not likely to be sufficient to reduce their individual fitness or performance. NMFS cannot accurately estimate the number of fish likely to be exposed to competition, but does not expect this short-term stress to reduce the individual performance of juvenile salmonids, or cascade through the watershed population of these species. Fish that avoid capture during relocation may be exposed to risks described in the following section on dewatering (see Section 2.5.2 below).

The number of juvenile coho and steelhead that may be present in the action area is difficult to predict with much confidence due to the dynamic nature of the stream reach in question. As determined by a combination of data assessment from Higgins (2013, 2016, 2018, 2021), and professional opinion, coho and steelhead abundance in the action area could range from 0.05-0.12 fish per square foot. To err on the side of the species, NMFS will utilize the higher density estimate of 0.12 fish per square foot to calculate take. Using this data, and the proposed dewatering area of 1,152 square feet, NMFS estimates that no more than 138 juvenile coho and 138 juvenile steelhead would be present in the dewatered area when relocation and dewatering activities occur.[4] Considering environmental variability including interannual variation in temperature, variations in predator or prey abundance, habitat conditions in the action area, and NMFS' best professional judgement, NMFS assumes that as many as 25 percent more juvenile coho and steelhead may be present in the area to be dewatered. If 25 percent more juvenile coho and steelhead are present this would result in 173 juvenile coho and 173 juvenile steelhead present in the 1,152 square foot dewatering area.[5] Similar to coho and steelhead, it is difficult to predict the number of juvenile Chinook salmon that maybe present within the dewatered area due to the same circumstances listed above. But, in utilizing the same data above (Higgins 2013), and professional judgement, NMFS expects that no more than five juvenile Chinook salmon would be present in the 1,152 square foot dewatering area.

Applying applicable AMMs to fish collection, relocation, and dewatering activities is expected to appreciably reduce the effects of project actions on juvenile salmonids. Specifically, salmonid collection and relocation activities conducted by NMFS-approved fisheries biologists will ensure proper equipment operation and application of NMFS guidelines thereby minimizing injury and mortality to juvenile salmonids. Restricting the work window to June 15 to October 15 will limit the effects to stream rearing juvenile salmonids. NMFS expects applying AMMs will effectively minimize injury and mortality to juvenile salmonids in the action area.

2.5.2. Dewatering

As described above, completion of the project will require dewatering of Dutch Charlie Creek. Cofferdams and a series of pipes will be used to temporarily divert flows around the work site during construction. Dewatering of the channel is estimated to affected up to 48 linear feet of Dutch Charlie Creek. NMFS anticipates temporary changes to instream flow within, and downstream of, the project site during installation of the diversion system, and during dewatering operations. Once installation of the diversion system is complete, stream flow above and below the work sites should be the same as free-flowing pre-project conditions, except within the dewatered reaches where stream flow is bypassed and/or pools are dewatered. These fluctuations in flow are anticipated to be small, gradual, and short-term, but are expected to cause a temporary loss, alteration, and reduction of aquatic habitat, and in the case of areas that will be dewatered, will likely result in mortality of any salmonids that avoid capture during fish relocation activities.

Stream flow diversion and dewatering could harm any rearing salmonid individuals by concentrating or stranding them in residual wetted areas before they are relocated. Juvenile salmonids that avoid capture in the project work area will likely die during dewatering activities due to desiccation, thermal stress, or may be crushed by equipment or foot traffic if not found by biologists while water levels within the reach recede. Because the pre-dewatering fish relocation

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[4] 0.12 fish/square foot * 1,152 square feet = 138 fish/square foot.

[5] (138 fish/square foot * 0.25) + 138 = 173 fish/square foot (rounded up from 172.5).

efforts at the project site will be performed by qualified biologists, NMFS expects that the number of juvenile salmonids that will be killed as a result of stranding during dewatering activities will be very small, likely no more than one percent of the steelhead within the work site prior to dewatering.

Dewatering operations at the work site may affect benthic (bottom dwelling) aquatic macroinvertebrates, an important food source for salmonids. Benthic aquatic macroinvertebrates at the project site may be killed or their abundance reduced when river habitat is dewatered (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from stream flow diversion and dewatering activities will be temporary because construction activities will be short lived, and the dewatered reach will not exceed 48 linear feet within Dutch Charlie Creek. Rapid recolonization (typically one to two months) of disturbed areas by macroinvertebrates is expected following rewatering (Cushman 1985, Thomas 1986, Harvey 1986). Within the action area, the effect of macroinvertebrate loss on juvenile salmonids is likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered area since stream flow will be bypassed around the work site. Based on the foregoing, juvenile salmonids are not anticipated to be exposed to a reduction in food sources at the work site from the minor and temporary reduction in aquatic macroinvertebrates as a result of dewatering activities.

Beyond the dewatered area, the temporary stream diversion is expected to resemble typical summer low flow conditions. The diversion system at the work site could restrict movement of listed salmonids in a manner similar to the normal seasonal isolation of pools by intermittent flow conditions that typically occur during summer within a portion of some streams throughout the range of the listed species considered in this biological opinion. Because habitat in and around the action area is adequate to support salmonids, NMFS expects salmonids will be able to find food both up- and downstream of the action area as needed during dewatering activities.

2.5.3. Increased Sedimentation and Turbidity

The proposed project will result in disturbance of the streambed and banks for construction. Construction activities within the action area may result in disturbance of the dewatered streambed and banks for equipment access, construction activities, and placement/removal of stream diversion structures. While the cofferdam and stream diversion is in place, construction activities are not expected to degrade water quality in the action area because the work areas will be dewatered and isolated from flowing waters. This disturbed soil on the creek bank is more easily mobilized when later fall and winter storms increase streamflow levels. Thus, NMFS anticipates disturbed soils could affect water quality in the action area in the form of small, short-term increases in turbidity during rewatering (i.e., cofferdam removal), and subsequent higher flow events during the first winter storms post-construction.

Instream and near-stream construction activities have been shown to result in temporary increases in turbidity (reviewed in Furniss et al. 1991, Reeves et al. 1991, Spence et al. 1996). Sediment may affect fish by a variety of mechanisms. High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelley 1961, Bjornn et al. 1977, Berg and Northcote 1985), reduce growth rates (Crouse et al. 1981), and increase plasma cortisol levels (Servizi and Martens 1992). High turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to disease, and can also cause fish mortality (Sigler et al. 1984, Berg and Northcote 1985, Gregory and Northcote 1993, Velagic 1995, Waters 1995). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation, decreasing chances of survival. Increased sediment disposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles (Alexander and Hansen 1986).

Chronic elevated sediment and turbidity levels may affect salmonids as described above. However, sedimentation and turbidity levels associated with cofferdam removal, rewetting of the construction sites within the action area, and subsequent rainfall events are not expected to rise to the levels described in the previous paragraph because the project's proposed soil and channel stabilization measures will be implemented to avoid and/or minimize sediment mobilization. Additionally, Caltrans' proposed additional AMMs and BMPs specifically aimed at reducing erosion, scour, and sedimentation in storage and staging areas, and from dewatering (Caltrans 2023). Therefore, any resulting elevated turbidity levels would be minor, occur for a short period, and be well below levels and duration shown in the scientific literature as cause injury or harm to salmonids (Sigler et al. 1984, Newcombe and Jensen 1996). NMFS expects any sediment or turbidity generated by the project would not extend more than 100 feet downstream of the worksites, based on site conditions and methods used to control sedimentation and turbidity. Thus, NMFS does not anticipate harm, injury, or behavioral impacts to juvenile salmonids associated with exposure to minor elevated suspended sediment levels that could reduce their survival chances.

2.5.4. Pollution from Hazardous Materials and Contaminants

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

The equipment needed to complete the project has the potential to release debris, hydrocarbons, concrete, and similar contaminants into surface waters at both work sites. These effects have the potential to harm or injure exposed fish and temporarily degrade habitat. However, AMMs proposed at both work sites will substantially reduce or eliminate the potential for construction materials and debris to enter waterways. Limiting the work window to the dry season from June 15 to October 15 will limit hazardous material exposure to juvenile salmonids, and eliminate potential for containments to adversely affect the most sensitive life stages (i.e., eggs, alevin, and fry). Equipment will be checked daily at both work sites to ensure proper operation and avoid any leaks or spills. Proper storage, treatment, and disposal of construction materials and discharge management is expected to substantially reduce or eliminate contaminants entering both waterways via runoff. A SWPPP and a SWCP will be implemented to maintain water quality during and after construction within Dutch Charlie Creek, and render the potential for the project to degrade water quality and adversely affect salmonids improbable.

2.5.5. Post Construction Water Quality

The proposed bridge replacement would result in a wider bridge adding approximately 0.06 acres of net new impervious surface area adjacent to Dutch Charlie Creek. Published work has identified storm water from roadways and streets as causing a high percentage of rapid mortality of adult coho salmon in the wild (Scholz et al. 2011) and laboratory settings (McIntyre et al. 2018). Subsequent laboratory studies showed this mortality also occurred in juvenile coho salmon (Chow et al. 2019) as well as juvenile steelhead and chinook salmon (Brinkmann et al. 2022, McIntyre and Scholz, unpublished results, 2020). The new bridge resulting from Project construction may expose salmonids to the degradation product of tires (6PPD-quinone) which has been identified as the causal factor in coho salmon mortality at concentrations of less than a part per billion (Tian et al. 2022, Tian et al. 2021), and to juvenile steelhead trout at concentrations of one part per billion (Brinkmann et al. 2022, J. McIntyre and N. Scholz, unpublished results, 2020). This contaminant is widely used by multiple tire manufactures and the tired dust and shreds that produce it have been found to be ubiquitous where both rural and urban roadways drain into waterways (Sutton et al. 2019, Feist et al. 2018). Coho adults were noted to perish “within hours” of exposure (Scholz et al. 2019) and juvenile coho perished or were completely immobile within seven hours of exposure (Chow at al. 2019). Coho juveniles did not recover even when transferred to clean water (Chow et al. 2019). Steelhead mortality can begin as soon as seven hours post exposure (Brinkmann et al. 2022). Effects appears to be related to cardiorespiratory disruption, consistent with symptoms (surface swimming and gaping followed by loss of equilibrium (Scholz et al. 2011) and therefore sublethal effects such as disruption of behaviors needed for survival (e.g. predator avoidance) and swimming performance are expected. Additional research concerning sublethal effects is needed. Mortality can be prevented by infiltrating the road runoff through soil media containing organic matter which results in removal and this (and other contaminant(s) (Fardel et al. 2020, Spromberg et al. 2016, McIntyre et al. 2015).

The exposure will be minimized through post-construction storm water BMPs intended to address water quality concerns associated with road projects such as where there is an increase in impervious surfaces. These changes in peak stormwater runoff rates would be offset through permanent design measures, such as directing flows through new bioswales, and through restoration of riparian vegetation. Therefore, we expect mortality associated with construction of the new bridge, when implemented with the proposed preventative water quality control measures, will be avoided.

2.5.6. Removal of Riparian Vegetation, Habitat Loss, and Increased Shade

Approximately 0.001 acre of red alder riparian forest will be permanently impacted due to bridge widening, and approximately 0.038 acre of red alder riparian forest will be temporarily impacted due to vegetation clearing, grading, and construction of the temporary detour. An estimated five red alders, with a dbh of 10 inches or less, would be removed. These trees are located along the banks of Dutch Charlie creek, above the OHWM.

Riparian vegetation helps maintain stream habitat conditions necessary for salmonid growth, survival, and reproduction. Riparian zones and wetland/aquatic vegetation serve important functions in stream ecosystems such as providing shade (Pool and Berman 2001), sediment storage and filtering (Cooper et al. 1987, Mitsch and Gosselink 2000), nutrient inputs (Murphy and Meehan 1991), water quality improvements (Mitsch and Gosselink 2000), channel and streambank stability (Platts 1991), source of woody debris that creates fish habitat diversity (Bryant 1983, Lisele 1986, Shirvell 1990), and both cover and shelter for fish (Bustard and Narver 1975, Wesche et al. 1987, Murphy and Meehan 1991. Riparian vegetation disturbance and removal can degrade these ecosystem functions and removal can degrade these ecosystem functions and impair stream habitat. Removal of riparian vegetation increases stream exposure of solar radiation, leading to increases in stream temperatures (Poole and Berman 2001).

Tree and vegetation removal will be minimized to the maximum extent feasible to prevent erosion and to reduce potential impacts of riparian vegetation removal on salmonids. The removal of riparian vegetation will result in both minor permanent and temporary reductions in shade and cover for fish, and will remove sources of woody debris that may contribute to habitat diversity and complexity. Trimmed vegetation is expected to grow back and the native vegetation disturbed during construction will be replanted on-site, following project completion. The project site will be monitored to ensure the success of revegetation efforts to restore areas impacted by removal of native riparian vegetation. Therefore, the services provided by vegetation such as shade and cover, sediment storage and filtering, nutrient inputs, sources of woody debris, and habitat complexity (i.e., cover) will remain degraded at the sites until new vegetation is replanted and becomes established. When considering complete removal of trees, we expect riparian vegetation attributes on-site will return to pre-project levels after native trees are replanted and established; possibly within 5-10 years due to Caltrans' proposed AMMs, revegetation measures, and vegetation growth rates. Because of the timing and establishment of the on-site revegetation and recruitment of new woody debris, loss of riparian vegetation may cause individual salmonids to seek alternative areas for cover and forage. Such temporary displacement of salmonids is not expected to reduce their individual performance because there are sites nearby that provide these features and can accommodate additional individuals without becoming overcrowded. However, a number of individuals could remain in the area directly adjacent to areas where vegetation is either temporarily or permanently impacted. For individuals that choose to stay in the area, the impacts of reduced shade, cover, and other vegetative services (i.e., sediment storage and filtering, nutrient input, etc.) from removal of riparian vegetation is not expected to significantly reduce their performance. Furthermore, as a result of Project construction, the action area will see an increase in shaded environments on Dutch Charlie Creek because of the new bridge. This new shaded area (0.12 acres) may provide nominal benefits (i.e., cooler water temperatures) to salmonids within the action area; however, it could also reduce the amount of riparian vegetation growing on the creek banks and bed adjacent to the bridge. Due to the small area affected by new shading, NMFS expects that effects that bridge widening will have on riparian vegetation will not negatively impact the behavior or fitness of individual salmonids.

2.5.7. Channel Form and Function

The proposed action will beneficially impact and improve freshwater rearing and migration PBFs by removing concrete abutments from the active channel within Dutch Charlie Creek. The existing abutments are within the active channel and inhibit natural channel form and function. The proposed new abutments will be outside of the active channel and will be parallel to the flow of the creek. Removal of this fill will restore natural form and function to this portion of the creek, and will provide a small amount of migratory and/or rearing habitat to NC steelhead, SONCC coho, and NC Chinook that travel through the action area that has not been accessible since construction of the bridge. In addition, a nominal amount of habitat will be restored with the removal of the remnant cable and decrepit chain link fence.

2.6. Cumulative Effects

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

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

2.7. Integration and Synthesis

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

SONCC coho salmon, CC Chinook salmon, and NC steelhead have declined to a large degree from historic numbers. Nearly all populations of SONCC coho salmon are at a high risk of extinction, but SONCC coho salmon are still found in all major river basins within the ESU. CC chinook salmon have a fragmented population structure, and the geographic distribution within the ESU has been reduced, particularly in southern and spring-run populations. Long-term population trends suggest that many populations of NC steelhead have a negative growth rate. The most recent status review reaffirmed the threatened status of SONCC coho salmon (NMFS 2016c), CC Chinook salmon (NNMFS 2016a), and NC steelhead (2016d).

As described in Section 2.5 Effects of the Action, NMFS identified the following components of the project that may result in effects to SONCC coho, CC Chinook, and NC steelhead: fish collection and relocation, dewatering, increases in sedimentation and turbidity, pollution from hazardous materials and contaminants, removal of riparian vegetation, habitat loss, increased shade, and removal of fill. Of these, fish collections and relocation, and dewatering have the potential to result in reduced fitness, injury, and/or mortality of SONCC coho, CC Chinook, and NC steelhead.

SONCC coho salmon, CC Chinook salmon, and NC steelhead occur within Dutch Charlie Creek, and are currently at low abundance levels throughout their ranges as compared to historical population estimates. Human induced factors affecting steelhead, coho salmon, and Chinook salmon critical habitat, such as logging, agricultural and mining activities, urbanization, stream channelization, dams, and wetland loss, have impaired migration, spawning and rearing habitat throughout their historic ranges. The project proposes to dewater Dutch Charlie Creek June 15 to October, during low flow conditions in the summer. Therefore, it is anticipated that only rearing juvenile salmonids would be affected by project activities and no adult salmonids or migrating smolts would be affected by the project activities. Furthermore, due to the small area of stream affected, and the low summer streamflow, NMFS estimates that a very small number of juvenile salmonids will be present in the dewatered reach prior to the construction. Individuals present will likely make up a small portion of the salmonid population within Dutch Charlie Creek. Anticipated mortality from relocation is expected to be two percent (or less) of the fish relocation and mortality expected from dewatering is expected to be one percent (or less) of the fish in the area prior to dewatering (combined mortality not to exceed three percent). Due to the relatively large number of juveniles produced by each spawning pair, salmonid spawning in the area in future years are likely to produce enough juveniles to replace the few juveniles that be lost as the project site due to relocation and dewatering. Thus, it is unlikely that the small potential loss of juvenile salmonids during the life of the project will impact future adult returns.

In addition to the adverse effects described above, we also consider the potential impacts of increased sedimentation and turbidity, pollution from hazardous materials and contaminants, removal of riparian vegetation, habitat loss, and increased shading. The implementation of proposed AMMs is expected to render the potential for fish to be exposed to pollution from hazardous materials and contaminants during and after construction improbably. Increased sedimentation and turbidity and temporary loss and degradation of habitat in the dewatered area will cease shortly after construction in completed and will only result in minor impacts to salmonids. Riparian vegetation removed to construct the project will take up to 10 years to return to pre-project levels. During this timeframe, individual salmonids exposed to reduced cover and forage will be able to successfully complete their life cycle in the action area or alternatively nearby habitats. The small shaded area that will be created by the bridge (0.12 acres) is expected to only have negligible effects on salmonids. NMFS does not expect any of the aforementioned effects to combine with other effects in any significant way.

For short-term effects, climate change is not expected to significantly worsen existing conditions over the time frame considered in this biological opinion. Considering the above, we do not expect climate change to affect salmonids in the action area beyond the scope considered in this biological opinion. For the long-term effects, climate change would likely worsen conditions if total precipitation in California declines and critically dry years increase. These conditions would likely modify water quality, streamflow levels, rearing habitat and salmonid migration. The overall reduction in habitat quality caused by the project is limited to a small area of the watershed and therefore, even if climate change reduced the overall habitat quality in the future when combined with this proposed action any amplification in habitat degradation would be very small. We do not expect the proposed project to affect the persistence or recovery of the Dutch Charlie Creek population of SONCC coho salmon in the ESU, the CC Chinook salmon ESU, or the NC steelhead DPS. We base this conclusion on our findings above which considered the status of the species, the environmental baseline, all of the potential effects of the action, and the cumulative effects.

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, or NC steelhead or destroy or adversely modify their designated critical habitat.

2.9. Incidental Take Statement

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

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 listed juvenile SONCC coho salmon, CC Chinook salmon, and NC steelhead is likely to occur during fish relocation and dewatering of Dutch Charlie Creek between June 15 and October 15. Construction will be completed in one construction season. The number of SONCC coho salmon, CC Chinook salmon, and NC steelhead that are likely to be incidentally taken during dewatering activities is expected to be small, and limited to the pre-smolt and young-of-the-year juvenile life stage. NMFS expects that no more than two percent of the juvenile steelhead and salmonids present within the 1,152 square foot dewatering area of Dutch Charlie Creek will be injured, harmed, or killed during fish relocation activities. NMFS also expects that no more than one percent of the fish within the same dewatered area will be injured, harmed, or killed during dewatering activities. Because no more than 173 juvenile SONNC coho, 5 CC Chinook salmon, and 173 NC steelhead are expected to be present within the 1,152 square foot dewatered reach of Dutch Charlie Creek, NMFS does not expect more than 5 juvenile SONCC coho salmon, 1 CC Chinook salmon, or 5 NC steelhead will be harmed or killed by the project.

Incidental take will have been exceeded if:

- more than 173 juvenile SONCC coho salmon are captured during construction; or
- more than five juvenile SONCC coho salmon are harmed or killed during construction; or
- more than 173 juvenile CC Chinook salmon are captured during construction; or
- more than five juvenile CC Chinook salmon are harmed or killed during construction; or
- more than five juvenile NC steelhead are captured during construction; or
- more than one juvenile NC steelhead are harmed or killed during construction.

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" refer to those actions the Director considers necessary or appropriate to minimize the impacts of the incidental take on the species (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 injury and mortality to salmonids resulting from fish relocation and dewatering activities is low;
2. undertake measures to minimize harm to salmonids from construction of the project and degradation of aquatic habitat; and
3. prepare and submit plans and reports regarding the effects of fish relocation, sound monitoring, construction of the project, and post-construction site-performance.

2.9.4. Terms and Conditions

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

1. The following terms and conditions implement reasonable and prudent measure 1:
    a. Caltrans or their contractor will retain qualified biologists with expertise in the area of anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. Caltrans or their contractor shall ensure that all fisheries biologists be qualified to conduct fish collections in a manner which minimizes all potential risks to ESA-listed salmonids. Electrofishing, if used, shall be performed by a qualified biologist and conducted according to the NOAA fisheries Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000. See: https://media.fisheries.noaa.gov/dam-migration/electro2000.pdf
    b. The biologist will monitor the construction sites during placement and removal of cofferdams and channel diversions to ensure that any adverse effects to salmonids are minimized. The biologist will be on site during all dewatering events to capture, handle, and safely relocation salmonids to an appropriate location. The biologist will notify NMFS staff at (707) 582-3830 or elena.meza@noaa.gov, one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities. During fish relocation activities the fisheries biologist shall contact NMFS staff at the above number, if mortality of federally listed salmonids exceeds three percent of the total salmonids collected, at which time NMFS will stipulate measures to reduce the take of salmonids.
    c. Salmonids will be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish will be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish will not be removed from this water expect when released. To avoid predation, the biologists will have at least two containers and segregate young-of-the-year from larger age classes and other potential aquatic predators. Captured

salmonids will be relocated, as soon as possible, to a suitable instream location in which suitable habitat conditions are present to allow for adequate survival of transported fish and fish already present.

d. If any salmonids are found dead or injured, the biological monitor will contact NMFS staff at (707) 582-3830 or elena.meza@noaa.gov. All salmonid mortalities will be retained until further direction is provided by the NMFS biologist (listed above).
    i. Tissue samples are to be acquired from each mortality prior to freezing the carcass per the methods identified in the NMFS Southwest Fisheries Science Center Genetic Repository protocols: Either a 1 cm square clip from the operculum or tail fin, or alternatively, complete scales (20-30) should be removed and placed on a piece of dry blotter/filter paper (e.g. Whatman brand). Fold blotter paper over for temporary storage. Samples must be airdried as soon as possible (do not wait longer than 8 hours). When tissue/paper is dry to the touch, place into a clean envelope labeled with Sample ID Number and seal the envelope.
    ii. Include the following information with each tissue sample using the Salmonid Genetic Tissue Repository form or alternative spreadsheet: Collection date, collection locations (County, river, exact location on river), collector name, collector affiliation/phone, sample ID number, species, tissue type, condition, fork length (mm), sex (M, F, or Unk), adipose fin clip (Y or N), tag (Y or N), any notes of comments.
    iii. Send tissue samples to: NMAA Coastal California Genetic Repository, Southwest Fisheries Science Center, 110 McAllister Way, Santa Cruz CA 95060).

2. The following terms and conditions implement reasonable and prudent measure 2:
    a. To ensure that the project is built as designed and contractors adhere to construction best management practices, monitoring will be performed during construction by skilled individuals. Monitors will demonstrate prior knowledge and experience in stream channel design and restoration, fish passage design, construction minimization measures, and the needs of native fish, including salmonids. Monitoring will be performed daily. The monitor(s) will work in close coordination with project management personnel, the project design (engineering) team, and the construction crew to ensure that the project is built as designed.
    b. Any pumps used to divert live stream flow will be screened and maintained throughout the construction period to comply with NMFS' Fish Screening Criteria for Anadromous Salmonids (2000).
    c. Construction equipment used within the river channel will be checked each day prior to work within the river channel (top of bank to top of bank) and, if necessary, action will be taken to prevent fluid leaks. If leaks occur during work in the channel, Caltrans or their contractors will contain the spill and removed the affected soils.

d. Once construction is completed, all project-introduced material must be removed, leaving the creek as it was before construction. Excess materials will be disposed of at an appropriate disposal site.

3. The following terms and conditions implement reasonable and prudent measure 3:
   a. Caltrans must provide a written report to NMFS by January 15 of the year following construction. The report must be submitted to the parties and addresses described above in 1.b. The report must contain, at minimum, the following information:
   b. Project construction and fish relocation report – the report must include the following contents:
      i. **Construction Related Activities –** The report(s) must include the dates construction began, a discussion of design compliance including: vegetation installation, and post-construction longitudinal profile and cross sections; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, including a description of any and all measures taken to minimize those unanticipated effects and a statement as to whether or not the unanticipated effects had any effect on ESA-listed fish; the number of salmonids killed or injured during the project action; and photographs taken before, during, and after the activity from photo reference points.
      ii. **Fish Relocation** - The report must include a description of the location from which fish were removed and the release site including photographs; the date and time of the relocation effort; a description of the equipment and methods used to collect, hold, and transport salmonids; if an electrofisher was used for fish collection, a copy of the logbook must be included; the number of fish relocated by species; the number of fish injured or killed by species and a brief narrative of the circumstances surrounding ESA-listed fish injuries or mortalities; and a description of any problems which may have arisen during the relocation activities and a statement as to whether or not the activities had any unforeseen effects.
   c. **Post-Project Monitoring Reports and Surveys –** Project reports and survey information will be sent to the address above in 1.b., and must include the following contents:
      i. **Post-Construction Vegetation Monitoring and Reporting** - Caltrans must develop and submit for NMFS' review a plan to assess the success of revegetation of the site. A draft of the revegetation monitoring plan must be submitted to NMFS (address specified in 1.b. above) for review and approval prior to the beginning of the in-stream work season, at each project location. Reports documenting post-project conditions of vegetation installed at the site will be prepared and submitted annually on January 15 for the first five years following project completion, unless the site is documented to be performing poorly, then monitoring requirements will be extended. Reports will document vegetation health and survivorship and percent cover,

natural recruitment of native vegetation (if any), and any maintenance or replanting needs. Photographs must be included. If poor establishment is documented, the report must include recommendations to improve conditions.

2.10. Conservation Recommendations

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

2.11. Reinitiation of Consultation

This concludes formal consultation for Dutch Charlie Creek Bridge Replacement (BRLO-5919(091)).

Under 50 CFR 402.16(a): "Reinitiation of consultation is required and shall be requested by the federal agency where discretionary federal 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 (PFMC 2014) contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce.

3.1. Essential Fish Habitat Affected by the Project

Essential Fish Habitat is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. 1802[10]). “Waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle (50 CFR 600.10). The term “adverse effect” means any impacts which reduce the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrates and loss of, or injury to, benthic organisms, prey species, and their habitats, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of it and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.910). The EFH consultation mandate applies to all species managed under a Fishery Management Plan (FMP) that may be present in the action area.

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

3.2. Adverse Effects on Essential Fish Habitat

The potential adverse effects of the project on EFH have been described in the preceding biological opinion and include disturbance of the channel bed and banks, temporary and permanent loss of benthic habitat, temporary loss of wetted habitat, and temporary and permanent loss of riparian vegetation. Therefore, the effects of the project on ESA-listed species and designated critical habitat are anticipated to be the same as the effects to EFH in the action area.

3.3. Essential Fish Habitat Conservation Recommendations

Section 305(b)(4)(A) of the MSA authorizes NMFS to provide EFH Conservation Recommendations that will minimize adverse effects of an activity on EFH. Although temporary potential adverse effects are anticipated as a result of the project activities, the proposed AMMs in the accompanying biological opinion are sufficient to avoid, minimize, and/or mitigate for the anticipated effects. Therefore, no additional EFH Conservation Recommendations are necessary that would otherwise offset the adverse effects to EFH.

3.4. Supplemental Consultation

Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that 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 users of this opinion are Caltrans and their contractors. Individual copies of this opinion were provided to the 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, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

5. References

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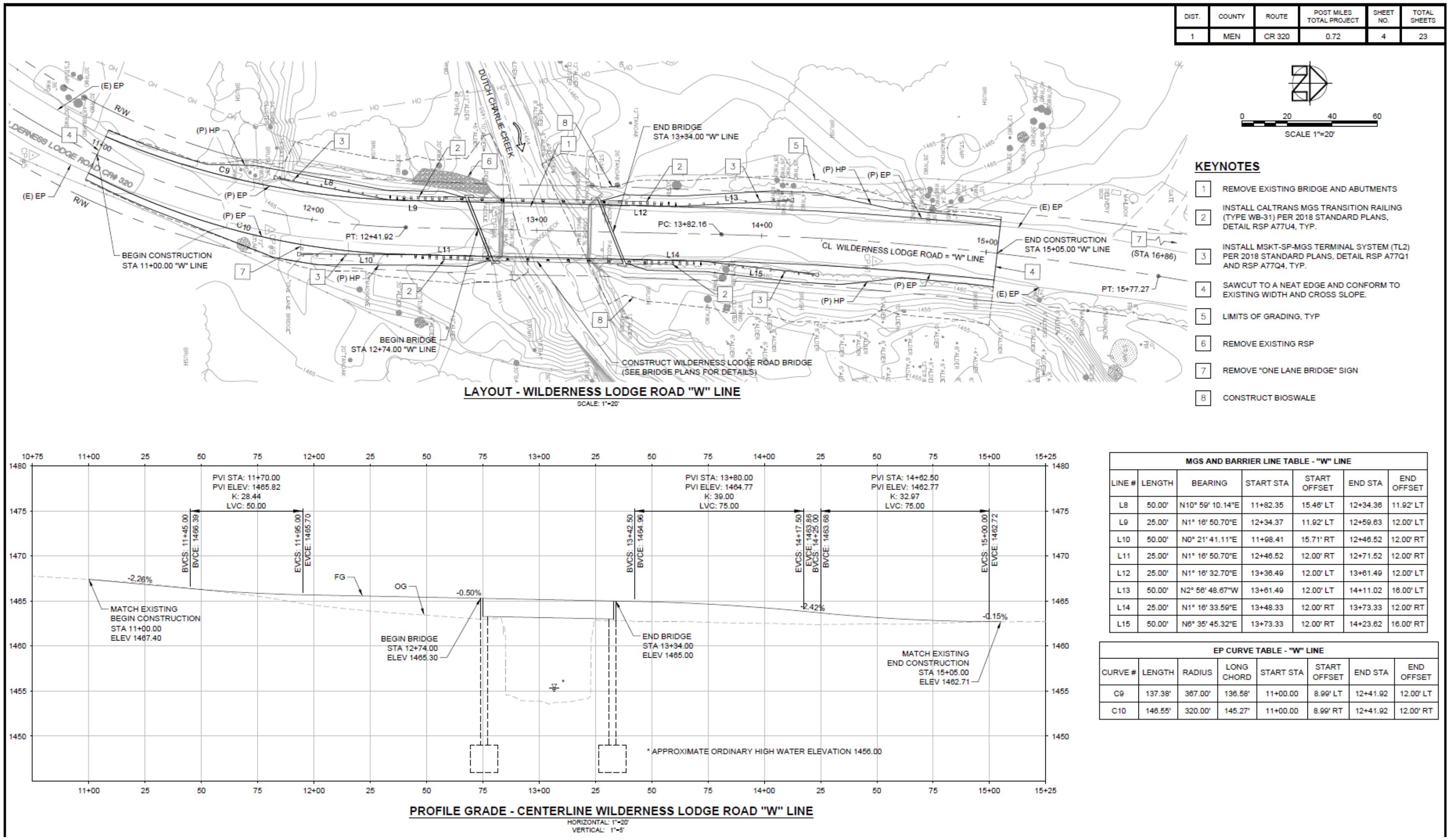
6. APPENDICES

6.1. Appendix A: Existing/Proposed Bridge Plan Sheet



MGS AND BARRIER LINE TABLE - "W" LINE

LINE #	LENGTH	BEARING	START STA	START OFFSET	END STA	END OFFSET
L8	50.00'	N10° 59' 10.14"E	11+82.35	15.46' LT	12+34.36	11.92' LT
L9	25.00'	N1° 16' 50.70"E	12+34.37	11.92' LT	12+59.63	12.00' LT
L10	50.00'	N0° 21' 41.11"E	11+98.41	15.71' RT	12+46.52	12.00' RT
L11	25.00'	N1° 16' 50.70"E	12+46.52	12.00' RT	12+71.52	12.00' RT
L12	25.00'	N1° 16' 32.70"E	13+36.49	12.00' LT	13+61.49	12.00' LT
L13	50.00'	N2° 56' 48.67"W	13+61.49	12.00' LT	14+11.02	16.00' LT
L14	25.00'	N1° 16' 33.59"E	13+48.33	12.00' RT	13+73.33	12.00' RT
L15	50.00'	N6° 35' 45.32"E	13+73.33	12.00' RT	14+23.62	16.00' RT

EP CURVE TABLE - "W" LINE

CURVE #	LENGTH	RADIUS	LONG CHORD	START STA	START OFFSET	END STA	END OFFSET
C9	137.38'	367.00'	136.58'	11+00.00	8.99' LT	12+41.92	12.00' LT
C10	146.55'	320.00'	145.27'	11+00.00	8.99' RT	12+41.92	12.00' RT

6.2. Appendix B: Bioswale Plan Sheets

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
1	MEN	CR 320	0.72	6	23

TREE REMOVAL TABLE

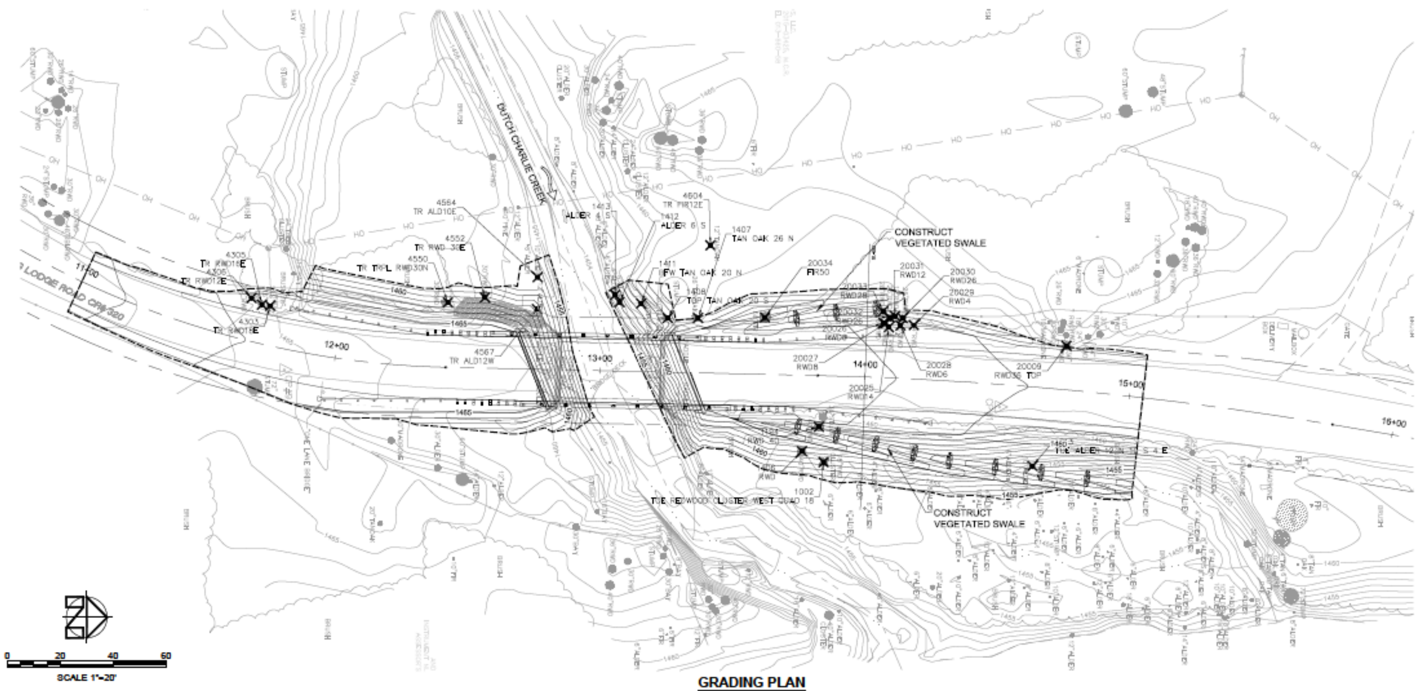
POINT #	TYPE/SIZE	ELEVATION	NORTHING	EASTING
1002	TOE REDWOOD CLUSTER WEST QUAD 18	1455.30	2381483.1436	6094806.2321
1013	TOE ALDER 12 N 10 S 4 E	1454,66	2381561,8936	6094807,6781
1194	RWD 40	1460,34	2381481,4205	6094792,8950
1406	RWD	1456.28	2381475.0289	6094802.1073
1407	TAN OAK 26 N	1462.43	2381436.8510	6094751.8511
1408	TOP TAN OAK 20 S	1462.33	2381424.4270	6094751.8825
1411	BFW TAN OAK 20 N	1457.76	2381414.4209	6094746.4508
1412	ALDER 6 S	1455.46	2381406.2247	6094746.0048
1413	ALDER 4 S	1455.92	2381404.5438	6094743.2230
4303	TR RWD18E	1466.77	2381274.6170	6094747.2890

TREE REMOVAL TABLE

POINT #	TYPE/SIZE	ELEVATION	NORTHING	EASTING
4305	TR RWD16E	1466.37	2381271.4370	6094746.8630
4306	TR RWD12E	1466.89	2381267.5600	6094744.3650
4550	TR TRPL RWD30N	1458.89	2381341.5480	6094746.0730
4552	TR RWD 30E	1458.44	2381355.5000	6094744.2120
4564	TR ALD10E	1456.89	2381375.4110	6094736.5510
4567	TR ALD12W	1455.49	2381375.1170	6094748.5680
4604	TR FIR12E	1462,83	2381440,5250	6094724,5430
20009	RWD36 TOP	1464,30	2381574,6971	6094762,4415
20025	RWD14	1460,78	2381507,7742	6094755,3940
20026	RWD6	1460,79	2381505,7431	6094753,7930

TREE REMOVAL TABLE

POINT #	TYPE/SIZE	ELEVATION	NORTHING	EASTING
20027	RWD8	1460,76	2381506,4278	6094753,9810
20028	RWD6	1460.42	2381512.1556	6094754.7325
20029	RWD4	1460.52	2381517.1827	6094754.6732
20030	RWD26	1460.56	2381512.9492	6094751.9725
20031	RWD12	1460,33	2381510,0948	6094751,2472
20032	RWD26	1460,33	2381508,1354	6094751,7958
20033	RWD28	1460,33	2381505,5881	6094749,4432
20034	FIR50	1460,98	2381461,0403	6094751,6843



GRADING PLAN
SCALE: 1"=20'

ABBREVIATIONS

BFW (E) TREE, PIP
RWD REDWOOD
TOP (E) TREE, PIP
TR TREE
TRPL TRIPLE

LEGEND

---- LIMITS OF GRADING
● (E) TREE, PIP
✕ (E) TREE TO BE REMOVED

MGE ENGINEERING, INC.
7415 GREENHAVEN DRIVE, SUITE 100
SACRAMENTO, CALIFORNIA 95831
TEL: (916) 421-1000

REGISTERED ENGINEER - CIVIL
PLANS APPROVAL DATE

MENDOCINO COUNTY DEPARTMENT OF TRANSPORTATION

REV	DESCRIPTION	BY	DATE

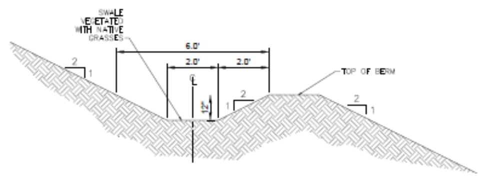
DRAWN J. HELM	DATE 11/1/2022
CHECKED K. WANG	DATE 11/1/2022
RECOMMENDED B. REICHEL	DATE 11/1/2022

BRIDGE REPLACEMENT
DUTCH CHARLIE CREEK BRIDGE
ON WILDERNESS LODGE ROAD

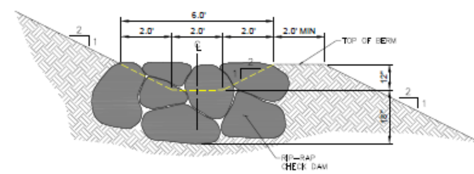
GRADING PLAN

SHEET 6 OF 23 SHEETS

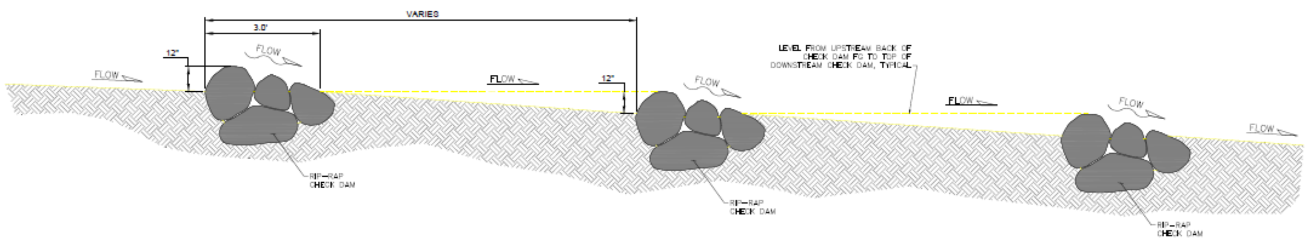
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
1	MEN	CR 320	0.72	7	23



VEGETATED SWALE
NTS



RIP-RAP CHECK DAMS AT SWALE
NTS



VEGETATED SWALE FLOWLINE WITH RIP-RAP CHECK DAMS
NTS

MGE ENGINEERING, INC.
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REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

MENDOCINO COUNTY
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BRIDGE REPLACEMENT
DUTCH CHARLIE CREEK BRIDGE
ON WILDERNESS LODGE ROAD

VEGETATED SWALE DETAILS

SHEET 7 OF 23 SHEETS

FED PROJ NO.: 5910(091)

C.R. 320, M.P. 0.72