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

March 14, 2023 **Refer to NMFS No:** WCRO-2022-02848

Darrel Cardiff
Branch Chief, Environmental Planning
California Department of Transportation, District 1
1656 Union Street
Eureka, California 95501-3700

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Mattole Road PM 5.25 Storm Damage Repair Project in Humboldt County, California [ER-32LO-5904(109)]

Dear Mr. Cardiff:

Thank you for your letter of October 27, 2022, 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 California Department of Transportation's (Caltrans[1]) proposed Mattole Road PM 5.25 Storm Damage Repair Project (Project), Caltrans reference ER-32LO-5904(109).

Thank you also for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1855(b)) for this action. We agree that the Project may adversely affect EFH for Pacific salmonids. Therefore, we have included the results of that review in this document and have provided two EFH Conservation Recommendations.

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

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

nor is the Project likely to destroy or adversely modify designated critical habitat for the three threatened salmonid populations. NMFS expects the Project would result in incidental take of CC Chinook and NC steelhead. An incidental take statement with terms and conditions is included with the enclosed biological opinion. NMFS concurs with Caltrans' determination that the Project is not likely to adversely affect individual SONCC coho salmon.

Please contact Mike Kelly at (707) 840-5564, Northern California Office, Arcata, or via email at Mike.Kelly@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: Kathryn Rian, California Department of Fish and Wildlife, Eureka, CA; Kathryn.Rian@Wildlife.ca.gov
e-file FRN 151422WCR2022AR00201

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion

Mattole Road PM 5.25 Storm Damage Repair Project
Humboldt County, California

NMFS Consultation Number: WCRO-2022-02848

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	No	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	Yes

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: March 14, 2023

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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 the NMFS Northern California Office in Arcata, California.

1.2. Consultation History

On March 3, 2015, NMFS biologist Mike Kelly visited the Project location with staff of the applicant, Humboldt County Public Works (HCPW), while he was the biologist for Caltrans Local Assistance.

On May 7, 2021, the applicant's consultant (GHD) obtained an official species list for this location using the NMFS California Species List Tool in Google Earth. (The species list was correct at the initiation of this consultation.) The species list identified that the location includes Southern Oregon/North California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), California Coastal (CC) Chinook salmon (*O. tshawytscha*), and Northern California (NC) steelhead (*O. mykiss*) and their critical habitats; and Essential Fish Habitat (EFH) for the Pacific Salmon Fisheries Management Plan (FMP).

On May 14, 2021, HCPW biologist Andrew Bundschuh contacted Mike Kelly via email to request assistance in advising their consultant on formatting and contents of the Biological Assessment (BA).

On July 20, 2021, Caltrans Local Assistance biologist Christa Unger provided an early draft BA to Mike Kelly. Mike Kelly provided comments the next day.

On July 22, 2021, Mike Kelly participated in an online meeting with staff from Caltrans (Darrell Cardiff, Julia Peterson, Christa Unger), HCPW biologist Andrew Bundschuh, GHD biologist Jeremy Svhela, Stantec staff (Wirt Lanning, Connie McGregor), and California Department of

Fish and Wildlife (CDFW) biologist Gregory O'Connell to discuss summer steelhead in the Mattole River and how to incorporate this sub-population of NC steelhead, which is listed separately by CDFW, into the section 7 consultation so that CDFW can issue a consistency determination under the California Endangered Species Act (CESA).

On December 13, 2021, Christa Unger provided an updated draft of the BA to Mike Kelly for review.

On December 14, 2021, Mike Kelly responded to Christa Unger via email that the BA contained too much repetition and irrelevant information, and that some of the determinations of effects of individual project elements were inconsistent with analyses in the BA.

On December 18, 2021, Mike Kelly participated in an online meeting with Caltrans staff (Christa Unger, Darrell Cardiff, Vincent Heim) and Gregory O'Connell to discuss CDFW's needs for their CESA consistency determination and general technical assistance.

On December 20, 2021, Christa Unger provided minutes for the meeting on December 18.

On December 21, 2021, Mike Kelly provided comments on the meeting minutes for the meeting of December 18.

On February 14, 2022, Christa Unger provided a third draft of the BA to Mike Kelly for review.

On February 18 2022, Mike Kelly emailed general comments about the draft BA, including that it still contained too much irrelevant information.

On February 22, 2022, Mike Kelly emailed a marked-up copy of the draft BA, which included the comment that the effects determination of "likely to adversely affect" critical habitat was not clearly supported by the analysis in the BA.

On August 2, 2022, Christa Unger provided a fourth draft of the BA to Mike Kelly for review.

On August 3, 2022, Mike Kelly provided comments on the draft BA, including the observation that the BA seemed fine except that the conclusion for effects to critical habitat was still not consistent with the analysis, and that this should be rectified.

On October 24, 2022, Christa Unger forwarded a final BA and letter requesting ESA section 7 consultation and EFH consultation. Mike Kelly replied that the letter had significant typographical errors that needed to be fixed to make it clear what kind of consultation Caltrans was requesting. This final BA still contained a conclusion of effects to critical habitat that was not clearly supported by the analysis. However, Mike Kelly agreed to accept the BA as-is and to provide additional analysis in the biological opinion to inform NMFS' final conclusions.

On October 27, 2022, Christa Unger provided an updated letter requesting ESA section 7 consultation and EFH consultation.

On October 27, 2022, NMFS confirmed that there was sufficient information to initiate formal section 7 consultation and EFH consultation.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On

September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the biological opinion and incidental take statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

On February 27, 2023, Kathryn Rian from CDFW provided new language for Caltrans to incorporate into their BA, and for NMFS to incorporate into this opinion. This language is intended to enable a Consistency Determination on this opinion for Caltrans' compliance under the CESA.

On March 3, 2023, Caltrans provided an amended BA to NMFS that contained the new language requested by CDFW. NMFS accepted the new BA and incorporated the new language into this opinion.

1.3. Proposed Federal Action

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

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

We considered, under the ESA, whether or not the Project would cause any other activities and determined that it would not. Repair of the slide and road will not facilitate use by numbers or types of vehicles that do not already use the road.

The Project is described in detail in Caltrans' BA (Caltrans 2022). Project elements that may affect salmonids and their critical habitats, and accompanying measures to minimize impacts, are summarized below, while the remaining project description is incorporated by reference to Caltrans' BA.

Caltrans' Local Assistance program is funding the applicant (HCPW) to stabilize a chronic landslide that reaches from the toe of the slope adjacent to the bank of the Mattole River up to and above Mattole Road at Post Mile (PM) 5.25 to the extent possible. (This slide has been persistent enough that it has earned a name: the Roscoe Slide.)

Caltrans also proposes to restore the roadway, improve roadway drainage, and reduce erosion potential along the toe of the slide. Primary elements of the Project include longitudinal and transverse slope sub-drainage, a reinforced road embankment (supplemented by lightweight fill if feasible), replacement of an existing culvert, and rock slope protection (RSP) armoring interplanted with willows at the slope toe along the Mattole River.

1.3.1 Access and Staging

The Project will be accessed via Mattole Road, and a temporary access road from Mattole Road to the Mattole River over the slide area will be built. The access road is likely to include

switchbacks and is expected to be 16 feet wide along the straight sections and wider at the turns to accommodate vehicle turning radiuses. Staging areas will be at existing turnouts and existing disturbed areas.

Construction will occur between June 15 and October 31, when the chance of precipitation is lowest and Mattole River streamflows are at their annual minimum. Caltrans expects construction to require one season.

1.3.2 Construction Site Conservation Measures

To minimize erosion, sediment, and pollutant contribution to the Mattole River, best management practices (BMP's) consistent with Caltrans' Construction Site BMP Manual (Caltrans 2017) and the latest California Stormwater Quality Association (CASQA) BMP Manuals (CASQA 2022) will be implemented. Caltrans' BA provides details on specific measures. Most of these measures are standard practices that have proven efficacy and are familiar to NMFS' staff. Refer to Caltrans' BA and the above-referenced manuals for details.

1.3.3 Vegetation Removal and Revegetation

Vegetation removal will include roadside vegetation (primarily poison oak and coyote brush) and vegetation on the landslide surface to install the drains and for construction access. A few scattered small trees of less than 12-inch diameter at breast height (DBH) presently leaning on the hillside within the construction access limits would also be removed. Additionally, one 16-inch DBH California bay laurel and one 12-inch DBH Douglas fir will be removed. The temporary access road will be removed, treated with erosion control BMPs, and revegetated during site closure.

1.3.4 River Diversion and Dewatering

River diversion and/or dewatering will occur if there is water in the Project's construction limits. A variety of channel conditions are possible within the action area at the time of construction. The following are four potential channel scenarios. Each scenario will require different fish relocation and dewatering methods. Given the current streamflow regime and channel geometry within and near the action area, scenarios 1 and 2 are most likely. However, given the potential for the channel geometry to adjust within the action area prior to construction, two additional scenarios were also evaluated.

> Scenario 1: There is no water against the river bank in the action area, so dewatering and fish relocation would not be required.
>
> Scenario 2: There is a disconnected side channel against the river bank, so limited dewatering and fish relocation may be required.
>
> Scenario 3: There is a fully connected side channel against the river bank, so limited dewatering and fish relocation would be required.
>
> Scenario 4: The main channel of the Mattole River is fully flowing against the river bank in the action area, so river diversion and fish relocation would be required.

The maximum area of dewatering will be less than 600 feet long and occupy 0.5 acres of the channel. The area to be dewatered will be contained behind a cofferdam formed by a water bladder or other clean material such as plastic-lined gravel bags.

The spatial extent of dewatering will vary based on streamflow conditions and channel geometry within the action area. The length of the required coffer dam would vary based on scenario. The duration of dewatering also varies based on scenario and may range from 60 to 90 days. Water will be pumped to an upland area for infiltration as necessary, or will be reused for dust suppression and soil compaction during road embankment construction, and will not be directly discharged to surface waters. Following construction, cofferdams and other structures used during dewatering will be removed.

A final Dewatering and Diversion Plan will be developed by the contractor. All pumps would be screened to avoid fish entrainment. Fish screening specifications will be consistent with those required by CDFW and NMFS.

1.3.5 Fish Relocation

For scenarios requiring dewatering, fish relocation will also be required. Qualified fisheries biologist(s), with technical assistance from agency staff, will develop a Fish Relocation Plan based on existing site conditions. The Fish Relocation Plan will be submitted to NMFS and CDFW for review a minimum of 30 days before construction. A snorkel survey to estimate current fish counts may be conducted prior to construction to inform relocation efforts.

Fish relocation would likely include seining, and electrofishing if needed. If the dewatered area is connected to the main river, fish will initially be herded out with a seine before the cofferdam is closed. Prior to construction, any remaining isolated pools would be surveyed for fish. A qualified biologist would be present during any dewatering to relocate fish.

1.3.6 Upslope Construction

On the upslope side of the road, three longitudinal sub-drains with a minimum width of four feet will start partway up the landslide and extend downslope approximately 300 feet to the roadway. The sub-drains will be made of permeable drain rock and geotextile fabric and are intended to intercept subsurface flow. The three longitudinal sub-drains will include approximately four lateral sub-drains with a minimum width of two feet each. The longitudinal sub-drains would bisect an inboard ditch running parallel to the restored roadway and continue underneath the roadway. On the downslope side of the road, the longitudinal subdrains will discharge into rock energy dissipaters.

One or two new drainage culverts of approximately 18-inch diameter will be installed under the road and will discharge onto RSP downslope of the road.

Approximately 500 feet of the roadway would be re-established with a reinforced embankment composed of geogrid and native compacted soil or lightweight fill. Fill will not be composed of recycled rubber materials.

The roadway will be widened to approximately 20 feet with four-foot shoulders. Following grading, aggregate road base will be placed to achieve the final design elevation and slope. The restored roadway will be paved with asphalt concrete.

HCPW considered relocating the road, but the steepness and instability of surrounding land, along with likely difficulties is securing right-of-way for an alternate route, preclude relocation as an alternative.

1.3.7 Riverbank Construction

To protect the base of the slide from continued erosion, RSP will be placed along approximately 350 feet of riverbank. The RSP would be keyed below the anticipated scour depth, placed within the existing slope face, and extend up the slope a minimum of two feet above the 100-year flood elevation. Downed trees, stumps, and other habitat elements will remain as undisturbed as possible. Approximately 9,100 square feet of willows will be placed within the interstitial spaces of the RSP with native soil. An additional 15,600 square feet of alder and willow will be planted above the RSP. Irrigation may occur if needed.

1.3.8 Site Restoration

Following construction, the contractor will remove equipment, supplies, and construction waste. The disturbed construction area, including the temporary access road, will be restored to pre-construction conditions or stabilized with a combination of grass seed, straw mulch, rolled erosion control fabric, and other plantings. Hydroseeding would also be applied to disturbed areas on the repaired slope to reduce erosion.

1.3.9 Mitigation

The following language is taken from Caltrans' BA and is intended to enable CDFW to issue a Consistency Determination under the California Endangered Species Act:

> To help facilitate mitigation for the potential incidental take of up to one (1) northern California summer steelhead under CESA, the County will install a minimum of 9,000 square feet of native willow (*Salix* spp.) cuttings within the RSP to reduce sedimentation and provide riparian cover and associated thermal benefits (see Appendix A, Figure 3 – Project Overview and Figure 4 – CESA Mitigation Cross Section Layers of Willows Within RSP). The live willow mattress will consist of a minimum of three overlapping rows of willow branch cuttings placed horizontally within the interstitial spaces of the rock and backfilled with native soil, similar to techniques described in the California Salmonid Stream Restoration Manual (2010). This revegetation method has been successful in other slope stabilization and storm damage repair projects undertaken by Humboldt County along Lighthouse Road and East Branch Road. Planting will occur in the fall immediately prior to the typical rainy season. Live willow cuttings will be planted within several days of collection and stored in water after harvesting to increase capillary action and transplant viability. Temporary irrigation may occur if needed, for example, due to an extended dry period following planting and before plant establishment. To place the RSP and live willow plantings, a temporary unpaved access road will be constructed from the restored roadway down to the Mattole River. The temporary access road will be restored to pre-construction conditions, treated with erosion control BMPs, and revegetated during site closure.
>
> The goal of willow plantings is to increase riparian cover, which provides shade and thermal refugia for all salmonids, but more specifically summer-run steelhead that may be present in the project area during the hotter, low-flowing summer months.

Performance criteria will be met if the cover of live willows exceeds 75% absolute cover by the end of the five-year monitoring period. Annual monitoring will consist of ocular estimates of live, native woody cover in combination with photo monitoring from fixed points. If success criteria are not reached, additional willow cuttings and/or riparian trees will be planted until adequate live cover is achieved. Monitoring data and associated photos will be included in the annual monitoring reports.

Additionally, annual monitoring and reporting of performance of riparian wetland

mitigation will be conducted for a minimum period of five years following construction, in accordance with the U.S. Army Corps of Engineers regulatory program for the issuance of Department of the Army permits under Section 404 of the Clean Water Act, the Corps' Compensatory Mitigation Rule (2008), and the State Water Quality Control Board requirements under Section 401 Water Quality Certification permitting program. All applicable regulatory agencies, including the CDFW, will be provided copies of these monitoring reports.

This project is funded under Federal Aid Number ER-32L0(109) by Federal Highway Administration Emergency Relief Program as administered by Caltrans. Preliminary engineering (PE) costs to date total $144,500. A total of $1.149 million has been programmed for PE, Right-of-Way (RW), and Construction (CON) monies and include funds for construction of this permanent restoration project as described herein, including all associated BMPs and avoidance/minimization measures as described, as well as monitoring following project completion.

A Child Expenditure Authorization (EA) has been created for these estimated construction mitigation and monitoring requirements. Project costs related to monitoring and maintenance activities are being funded under Federal Aid Number ER-32L0(579). The final cost required for mitigation and monitoring under the Child EA is estimated to be $150,000. Of this $150,000, $125,000 is set aside specifically for CESA mitigation and monitoring ($100,000 for installation of willow cuttings within RSP and $25,000 for five years of monitoring and remediation). Caltrans will provide all required information and security in compliance with the September 3, 2021 Master Funding Agreement for Financial Assurance under CESA entered into by the California Department of Fish and Wildlife and Caltrans and the project-specific Funding Memorandum delivered to the California Department of Fish and Wildlife to ensure that it has adequate funding to complete the mitigation measures. The funds that will be allocated for mitigation and monitoring will be kept in the State Treasury until proposed mitigation work has been completed and accepted by the regulatory agencies and will not be re-allocated to another element of the project or expended for any purpose other than completing the mitigation and monitoring requirements.

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

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of

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

Caltrans determined the Project is not likely to adversely affect individual SONCC coho salmon. Our concurrence is documented in the "Not Likely to Adversely Affect" Determinations section (Section 2.12).

2.1. Analytical Approach

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

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

The designations of critical habitat for SONCC coho salmon, CC Chinook salmon and NC steelhead use the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the critical habitat regulations (50 CFR part 424) 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:

- Evaluate the rangewide status of the species expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species in the action area.

- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species, analyze whether the proposed action is likely to; (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.

In this opinion, we rely on known construction-related impacts to fish and habitat that result from activities such as riverbank stabilization. We then consider the severity of exposure and the number of ESA-listed salmonids that may be exposed. We estimate the number of fish that may be present based on physical habitat conditions and snorkel survey data provided by watershed monitoring and restoration groups. Water temperature is normally the overriding factor that determines summer use of the mainstem Mattole River by juvenile salmonids. Though we cannot reliably determine what the water temperature will be during construction, we believe that known presence as derived from snorkel surveys track well with expected timing and water temperature tolerance of juvenile salmonids. Therefore, we assume that conditions at the time of construction will be the same as in the recent past.

2.2. Rangewide Status of the Species

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

2.2.1 Species Description and General Life History

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

NC steelhead: NC Steelhead exhibit the most complex suite of life history strategies of any salmonid species. They have both anadromous and resident freshwater life histories that can be expressed by individuals in the same watershed. The anadromous fish generally return to

freshwater to spawn as 4- or 5-year-old adults. Unlike other Pacific salmon, steelhead can survive spawning and return to the ocean to return to spawn in a future year. It is rare for steelhead to survive more than two spawning cycles. Steelhead typically spawn between December and May. Like other Pacific salmon, the steelhead female deposits her eggs in a redd for incubation. The 0+ age fish emerge from the gravel to begin their freshwater life stage and can rear in their natal stream for 1 to 4 years before migrating to the ocean between March 1 and July 1 each year, although they have been observed as late as September (Ricker et al. 2014).

2.2.2 Status of Species and Critical Habitat

In this biological opinion, NMFS assesses four population viability parameters to help us understand the status of CC Chinook and NC steelhead and their ability to survive and recover. These population viability parameters are: abundance, population productivity, spatial structure, and diversity (McElhaney et al. 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information, including the Coastal Multispecies Recovery Plan (NMFS 2016) for NC steelhead and CC Chinook salmon to determine the general condition of each population and factors responsible for their current status. We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20).

Status of CC Chinook Salmon

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

CC Chinook Salmon Spatial Structure and Diversity: Williams et al. (2011) found that the loss of representation from one diversity stratum, the loss of the spring-run history type in two diversity substrata, and the diminished connectivity between populations in the northern and southern half of the ESU pose a concern regarding viability for this ESU. Based on consideration of this updated information, Williams et al. (2016) concluded the extinction risk of the CC Chinook salmon ESU has not changed since the last status review. The genetic and life history diversity of populations of CC Chinook salmon is likely very low and is inadequate to contribute to a viable ESU, given the significant reductions in abundance and distribution.

Status of NC Steelhead

NC Steelhead Abundance and Productivity: With few exceptions, NC steelhead are present wherever streams are accessible to anadromous fish and have sufficient flows. The most recent

status review by Williams et al. (2016) reports that available information for winter-run and summer-run populations of NC steelhead do not suggest an appreciable increase or decrease in extinction risk since publication of the last viability assessment (Williams et al. 2011). Williams et al. (2016) found that population abundance was very low relative to historical estimates, and recent trends are downwards in most stocks.

NC Steelhead Spatial Structure and Diversity: NC steelhead remain broadly distributed throughout their range, with the exception of habitat upstream of dams on both the Mad River and Eel River, which has reduced the extent of available habitat. Extant summer-run steelhead populations exist in Redwood Creek and the Mad, Eel (Middle Fork and 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).

Status of Critical Habitats

The condition of SONCC coho salmon, CC Chinook salmon, and NC steelhead critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the following human induced factors affecting critical habitat: overfishing, artificial propagation, logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Impacts of concern include altered streambank 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, 64 FR 24049, 70 FR 37160). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESU's and DPS. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

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

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

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 salmon 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 annual 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 have likely already experienced some detrimental impacts from climate change through lower and more variable stream flows, warmer stream temperatures, and changes in ocean conditions. California experienced well below average precipitation during the 2012-2016 drought, as well as record high surface air temperatures in 2014 and 2015, and record low snowpack in 2015 (Williams et al. 2016). Paleoclimate reconstructions suggest the 2012-2016 drought was the most extreme in the past 500 to 1000 years (Williams et al. 2016; Williams et al. 2020; Williams et al. 2022). Anomalously high surface temperatures substantially amplified annual water deficits during 2012-2016. 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 SONCC coho salmon, CC Chinook salmon, and NC steelhead 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 heat wave temperatures are likely to be higher (Hayhoe et al. 2004; Moser et al. 2012; Kadir et al. 2013). Total precipitation in California may decline 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 an increased incidence of marine heat waves, are likely already occurring, and are expected to increase (Frölicher, et al. 2018). In fall 2014, and again in 2019, a marine heatwave, known as "The Blob"[2], 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

[2] https://www.fisheries.noaa.gov/feature-story/new-marine-heatwave-emerges-west-coast-resembles-blob

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 of salmonids.

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 specific action area for the Project site is summarized below.

The action area for the Project encompasses the entire construction footprint that would be subject to direct impacts due to site access, river channel isolation and associated fish relocation, rock placement, and the extent of downstream turbidity excursion, which may extend approximately to 300 feet of downstream waters.

2.4. Environmental Baseline

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

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

Additionally, the NMFS Coastal Multispecies Recovery Plan (NMFS 2016) describes all summer-run steelhead populations as being at the highest level of threat due to climate change compared to winter-run populations.

2.4.1 Status of Listed Salmonids in the Action Area

CC Chinook salmon

Chinook salmon occurring in the action area belong to the Mattole River population of CC Chinook salmon, which is within the North Coastal Diversity Stratum. The spawner abundance target is 4,000 adults. Based on the number of live fish and redds seen on spawning grounds during recent surveys conducted by the Mattole Salmon Group (MSG), the spawning population likely numbers in the hundreds. However, the population is likely above its depensation

threshold (NMFS 2016), which can be thought of as the number of spawners needed for survival of the population.

The spawning distribution of Chinook salmon is concentrated primarily in the Mattole River headwaters and upper river tributaries based on redd surveys conducted between 1994 and 2017 by MSG. Chinook salmon appear to spawn with some consistency throughout the middle mainstem Mattole River, including small numbers in the vicinity of the action area. Spawning in the action area is likely limited to years when lower fall and winter flow conditions exclude them from upper tributaries (MSG 2011; MSG 2018a). Based on their fall and winter run timing, no adult Chinook salmon are expected in the action area during the construction season.

The majority of juvenile Chinook salmon migrate to sea during the spring. Prior to downstream migration, juvenile Chinook salmon have been observed rearing in the mainstem and larger tributaries (Bajer 2011). During the summer when the river becomes disconnected from the sea, small numbers of juvenile Chinook salmon have been observed in the mainstem river (Mattole River and Range Partnership 2009), which may also include the action area. Outmigrant trapping data at river kilometer 6.3 in the lower mainstem Mattole River was conducted from April into July, until 2011, with gear deployment and removal contingent on a river flow of 300 to 400 cfs, and closure of river mouth, respectively. The most recent population estimates of juvenile Chinook salmon, those from 2009, 2010, and 2011, were 123,874, 170,823, and 461,832, respectively (Piscitelli 2012). Because Chinook salmon primarily spawn upstream of the action area, most or all outmigrating juveniles pass through the action area.

The life stage of Chinook salmon that could be present in the action area is the pre-smolt stage. The key limiting stresses for this life stage are shelter, floodplain connectivity, water quality (temperature and turbidity), low flows and diversions, and estuary conditions (NMFS 2016).

The potential for juvenile Chinook salmon to occur in the action area during the summer months was further evaluated using MSG snorkel survey data. Data for July and August 2006 to 2017, showed fewer than ten juvenile Chinook salmon in total, with mean pool counts of 1 to 2 per pool, where they occurred. These data suggest that a very small number of juvenile Chinook salmon could occur in the action area during the proposed in-water work window, and Caltrans estimates no more than five juvenile Chinook salmon may be present during construction. NMFS agrees that their presence in low numbers may be possible, especially early in the construction season when water temperatures may still be tolerable, and we believe that the estimate of five juveniles is a reasonable conservative estimate.

NC Steelhead

Steelhead occurring in the action area belong to the Mattole River population of NC steelhead, which is within the North Coastal Diversity Stratum. The population occurs in two distinct runs: a winter-run, which enters the river between November and April, with a spawner abundance target of 10,700 adults; and a summer-run, which enters the river between May and October, with an effective population size of about 500 individuals (NMFS 2016).

There are no comprehensive survey results of winter-run steelhead abundance available for the Mattole River. However, steelhead redds are counted during surveys focused on coho salmon. Based on the number of live fish and redds seen on spawning grounds during recent surveys

conducted by MSG, the spawning population of winter-run steelhead likely averages around 1000 adults (NMFS 2016).

Additionally, steelhead in the Mattole River display the half-pounder life history. Half-pounders are immature steelhead that reside in fresh water for a portion of their life cycle before returning to the sea. Half-pounders are regularly observed during summer snorkel surveys conducted by the MSG, but in low numbers in the vicinity of the action area. Additionally, the action area does not provide suitable holding habitat, so adult summer steelhead and half-pounders are not expected in the action area except as they may migrate though.

The potential for juvenile steelhead to occur in the action area during the proposed in-water work window was evaluated using summer (July-August) snorkel survey observations conducted by MSG. Data from 2000 to 2017 suggest juvenile steelhead are present and relatively abundant in every reach of the Mattole River, with average densities ranging from about 25 to 60 juvenile steelhead (ages 0 and 1+ combined) (MSG 2015; MSG 2018b). A mean of 61.7 young-of-year (YOY) steelhead per pool was reported for the 2015 summer snorkel data in a reach just upstream of the action area (MSG 2015).

Based on these summer snorkel survey results and the condition of habitat in the action area, Caltrans estimates that up to 25 juvenile steelhead may be present in the action area and require relocation. NMFS agrees that this is a reasonable estimate. Additionally, CDFW (Greg O'Connell, personal communication) estimates that approximately 4% of steelhead within the Mattole River at the time of construction would be summer-run. Therefore, one juvenile summer steelhead would be expected to be present. While adult summer steelhead and half-pounders may transit the river reach adjacent to the action area, NMFS agrees that there is only a minuscule chance that they would be encountered during dewatering.

2.4.2 Status of Critical Habitat in the Action Area

Critical habitat is designated in the action area for SONCC coho salmon, CC Chinook salmon, and NC steelhead.

The riverbank within the action area offers limited riparian habitat with a few residual small shrubs and exposed soils. This generally poor habitat condition appears to be chronic judging by satellite imagery going back 20 years. That is, we see no evidence that this location would periodically stabilize and begin to shift to more suitable habitat. The entire slope above the riverbank is slumping and eroding. While there appear to be boulders exposed at the toe of the slope, the slope's soils have a high clay content and there are numerous small areas of seasonal seepage. The slope within the action area is northeast facing and quite steep; steeper than 1:1 in some places. The slope reaches the gravel bar or open water. The action area is located against a valley wall on the west side, and there is a floodplain within a large meander bend to the east. Therefore, the floodplain and associated habitats are restricted to the east side of the river and are not in the action area. For example, there are no undercut banks or overhanging vegetation in the action area.

NMFS Coastal Multispecies Recovery Plan (NMFS 2016) states:

> *The Mattole River is listed as sediment-impaired under section 303(d) of the Clean Water Act... Excessive fine sediment results in poor spawning habitat for adults, egg death,*

> *reduced velocity refugia for pre-smolts due to filling of pools, and reduced productivity of food organisms for pre-smolts and smolts. Gravel quantity rated poor for eggs, while the degree of embeddedness rated poor for eggs, pre-smolts and smolts and food productivity rated fair for pre-smolts and smolts.*

Additionally, Mattole River section of NMFS' SONCC Coho Salmon Recovery Plan (NMFS 2014) states:

> *Altered sediment supply presents a high stress across all life stages, except adults. Increased sediment delivery has filled pools, widened channels, and simplified stream habitat throughout the basin including the estuary.*

and

> *In many reaches stream beds have aggraded, reducing surface flows and limiting access for migrating juveniles. …the preponderance of poor rankings throughout the population area suggests that sediment delivery to stream channels is a stress affecting the population.*

Consistent with the conclusions in the Recovery Plans for the watershed in general, the river channel in the action area is dominated by a homogeneous riffle with little habitat complexity or cover. The river in the action area is likely to be very warm in the summer, nearing upper thermal limits for juvenile salmonid rearing. Very limited riparian cover is present within the action area, and water was shallow during site visits (less than three feet in April).

It appears that the road is not causing the landslide, though it is likely that the road contributes to localized erosion due to concentration of overland stormwater flow. The road is located on the slide approximately 300 feet above the toe, and 800 feet below the top of the slide. Given the slide's dimensions and the natural instability of local geology, we find it logical to conclude that this is a naturally-occurring slide that happens to have a road built across it.

As of July 2021, the thalweg of the Mattole River was located on the east side of the channel and beyond the construction limits of the Project. The thalweg was most recently located on the west side of the river in the action area in 2014.

The nearest active stream gauge on the Mattole is located approximately 15 river miles downstream of the action area near the community of Petrolia, California. Based on this gauge, Caltrans assessed summer and fall streamflows for water years 2016 through 2020 during the June 15 through October 31 period. Water year 2020 was the wettest, with mid-June streamflows commencing at 250 cfs and tapering as low as 30 cfs in September and October. Water year 2016 was the driest, with mid-June streamflows commencing at approximately 85 cfs and tapering to as low as 12 cfs in September (USGS 2021). Annual minimum streamflows in the action area may be lower.

2.5. Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action (see 50 CFR 402.02). A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur.

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

2.5.1 Fish Exclusion and Relocation

Data on fish relocation efforts from water diversion activities since 2004 show most average mortality rates are below three percent for salmonids. Therefore, given the measures that would be implemented to avoid and minimize impacts to fish during relocation efforts, NMFS expects no more than three percent of all relocated fish would be subject to potential injury or mortality.

As detailed in section 1.3, Caltrans proposes to isolate the work area and relocate any fish present. As described in section 2.4.1, Caltrans conservatively estimates that up to 25 juvenile steelhead, and up to five juvenile Chinook salmon may require relocation. While steelhead numbers may vary significantly between years, NMFS agrees that this estimate is reasonable and conservative, and is unlikely to be exceeded in a given year.

While both summer-run and winter-run steelhead are listed within the NC steelhead population, these life history variants represent important ecological diversity within the overall population of NC steelhead, as described in section 2.2 of this opinion. So, we believe it makes sense to consider any impacts to them both together as a single population and as separate sub-populations. Therefore, based on CDFW estimates, we expect approximately one of the relocated steelhead to be summer-run and 24 to be winter-run. The results of separately considering potential effects to each sub-population, and what this means to the overall NC steelhead population, are presented in section 2.7 below.

If we apply the three-percent mortality rate (rounded up to the nearest whole number) to the total number of juvenile winter-run and summer-run steelhead that we estimate could be relocated, we would expect that no more than one juvenile winter-run NC steelhead, and one juvenile summer-run NC steelhead would be injured or killed during relocation. We also estimate that these individuals may belong to any of three cohorts in a given year. These cohorts may consist of young-of-year, and one- and two-year-old steelhead.

2.5.2 Water Quality

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

Turbidity and Sedimentation

The activites that would have the greatest chance of producing turbidity will be isolated behind a cofferdam or will not be connected to surface waters. Therefore, we expect only minor turbitiy associated with placing and removing the cofferdam. We do expect some suspended sediment to be delivered to the stream after construction during the first flow-producing rainfall of the season due to ground disturbance.

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

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

However, due to anticipated success of BMP's and construction methods, we expect levels and durations to be below thresholds known to elicit avoidance responses in salmonids, and to be well below harm thresholds (Oregon Department of Environmental Quality 2014). Therefore, NMFS considers the potential amounts and duration of turbidity to be unlikely to reduce the fitness of salmonids in the action area.

Pollutants Associated with Stormwater Runoff and Spills
Contaminants generated by traffic, pavement materials, and airborne particles that settle may be carried by stormwater runoff into receiving waters. Stormwater runoff can introduce contaminants (e.g., copper, zinc, cadmium, lead, nickel, and other vehicle-derived chemicals) into waterways, where aquatic species can be affected. Copper and zinc are of particular concern due to their effect on salmonids at low concentrations. Dissolved copper and zinc in stormwater road runoff are difficult to remove, and have known negative effects on salmonids and other fishes (Sandahl et al. 2007). Additionally, Tian et al. (2022) found that a chemical called 6PPD-quinone, which derives from a preservative chemical used in tires, is associated with mortality of steelhead when in high concentration.

The crossing is in a remote area and receives relatively low use. Additionally, the road is approximately 300 feet above the river at a 1:1 slope, and we expect roadway runoff to infiltrate into the ground before reaching the river. Therefore, NMFS does not expect reductions in fitness of individual salmonids residing in the action area due to toxic materials in stormwater runoff.

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

2.5.3 Temporary Loss of Rearing Habitat

As described in Section 1.3.5 of this opinion, Caltrans will relocate fish and exclude them from the work area if it is connected to the river. So, this habitat would be unavailable to rearing salmonids for approximately 60 to 90 days between June 15 and October 31. However, Caltrans will distribute captured fish into functional rearing habitat, and fish that are herded out of the pool will still have access to habitat both up- and downstream of the site. Additionally, as described in section 2.4.2, the rearing habitat in the action area is of poor quality, and any salmonids there may have heightened vulnerability to predation due to the lack of cover. Relocated fish would likely be moved to better habitat than is available in the action area, and we

do not believe that detrimental over-crowding in other functional habitat will occur due to the relative scarcity of salmonids in the mainstem Mattole River during summer. Therefore, we believe the short-term loss of this habitat will not result in decreased fitness or survival of individual salmonids.

2.5.4 Effects to Critical Habitat

The Project is intended to stabilize a chronic landslide and includes approximately 350 feet of streambank stabilization. Streambank stabilization projects rarely improve salmonid habitat, and are typically expected to degrade salmonid habitat through a variety of mechanisms, including:

1) Streambank stabilization restricts a channel's ability to meander. Precluding lateral channel erosion can force streams to incise instead (i.e., erode downward instead of laterally) (Leopold et al. 1968; Schumm et al 1984), disconnecting the waterway from its adjacent floodplain (Hardison et al. 2009). Floodplain inundation benefits salmon and steelhead habitat in several ways, perhaps most importantly by creating low velocity, "off-channel" aquatic habitat characterized by abundant vegetative cover and high prey availability (Sommer et al. 2001), ideal conditions for recently-emerged juvenile fish that are too small to survive the high velocity discharge of the main channel. Also, given the highly turbid condition of most winter storm flows, entrained fine sediment naturally deposits as flows slow and spread over the floodplain, fostering fertile soil conditions for future riparian recruitment. Finally, incised stream channels can also lower the water table and impair groundwater/stream flow connectivity (Cluer and Thorne 2014), an important process supporting juvenile summer survival.

2) Structural streambank stabilization techniques typically replace an eroded section of streambank with non-deformable material that resists lateral streamflow scour. In the case of this Project, the material is RSP. A typical impact is a complete loss of aquatic and riparian habitat volume, function, and complexity as the native soil interface capable of revegetating is replaced with inert material lacking vegetation or structural complexity. RSP creates a simplified habitat interface ill-suited for rearing juvenile salmonids when compared to a natural stream bank exhibiting undercut banks, exposed tree roots and diverse vegetation (Schmetterling et al. 2001). RSP can also create habitat favoring predatory fish species.

3) Bank stabilization typically precludes natural fluvial and geomorphic processes important to creating and maintaining habitat over the long term (i.e., decades and centuries). By intent, streambank stabilization projects prevent lateral channel migration, which prevents recruitment of course sediment such as trees and boulders that add important complexity to channels and maintain high quality salmonid habitat. The resulting simplified stream reach has many ecosystem deficiencies; it can depress salmonid spawning success, limit benthic macroinvertebrate prey production (Lennox and Rasmussen 2016), and result in poor habitat quality for rearing juvenile salmonids (Lau et al. 2006). Also, because streambank stabilization structures are typically designed to withstand high streamflow caused by large storm events, the structures, and by extension the impacts to instream habitat, can be considered everlasting, harming future fish generations in perpetuity. Lastly, streambank stabilization impacts

> not only extend temporally; altered geomorphic and hydraulic processes can propagate spatially both upstream and downstream of streambank stabilization structures, dependent upon site- and structure-specific characteristics (Henderson 1986).

However, as described in section 2.4.2, the Project is located against the valley wall of the river rather than against an alluvial floodplain. Lateral migration is thereby limited in that direction. The opposite side of the river is against a broad floodplain in a meander bend that has not been artificially stabilized. Therefore, typical impacts associated with incision of the channel are unlikely to be created as a result of stabilization at this location.

The condition of riparian habitat at the base of the slide is already simplified and degraded due to the action of the active slide, which appears to be a chronic condition (See section 2.4.2.). There is little existing vegetation and bank complexity, and the existing habitat is correspondingly poor. Therefore, addition of RSP planted with willows is unlikely to further reduce the quality of available rearing habitat here.

The slide appears to provide coarse sediment in the form of boulders and possibly trees, though there is limited tree growth on the slide, which is likely due to the continuous motion of the slide. If the slide is permanently stabilized, the loss of boulder and tree recruitment to the channel will eliminate these habitat-forming processes over the long-term.

NMFS' Coastal Multispecies Recovery Plan (NMFS 2016) for CC Chinook salmon and NC steelhead lists the following as a Priority 2 recovery action:

> *Treat potentially large inputs of fine sediments that are imminent and will affect areas occupied by salmonids (i.e., failing banks, failing culverts, failing roads)*

Priority 2 means "actions must be taken to prevent significant decline in population numbers, habitat quality, or other significant negative impacts short of extinction."

Additionally, the Project also addresses a 3b priority listed in NMFS' SONCC Coho Salmon Recovery Plan (NMFS 2014):

> *Assess and map mass wasting hazard, prioritize treatment of sites most susceptible to mass wasting, and determine appropriate actions to deter mass wasting.*

and

> *Implement plan to stabilize slopes and revegetate areas based on assessment.*

A 3b priority means that the action is "needed to achieve recovery*"* but is not necessarily needed to "prevent extinction*"* or "significant decline."

While the project may provide some benefit toward recovery of these salmonid populations by reducing inputs of fine sediment, long-term recovery will require both reductions in fine sediment and recruitment of coarse sediment. If recovery efforts are successful and fine sediment is reduced in the system to a point where coarse sediment can function to create and maintain salmonid habitat, this area will not be able to function naturally. Therefore, while some benefits may accrue in the shorter-term, the longer-term value and function of critical habitat will be reduced.

Additionally, while RSP can provide habitat for predatory fish such as sculpins, we believe that the lack of available overhead cover at the toe of the slide makes salmonids more vulnerable to predators such as birds. Existing boulders at the toe of the slide would also provide habitat for predatory sculpins. Therefore, we believe that the proposed RSP and willow plantings will not create conditions of increased predation on juvenile salmonids in the action area because the action should help limit predation by birds and not is creating sculpin habitat where it does not already exist.

We expect short-term construction-related discharges of turbidity to have no lasting impact to the quality or quantity of existing habitat. While some sediment may initially settle on the river bottom, we expect it to be so light that it would be inconsequential in the near-term, and would be completely removed by the first high flows of the season. Therefore, the sediment would not have an appreciable impact on availability of aquatic macro-invertebrates (food source for salmonids), or salmonid habitat structure.

We expect that short-term loss of rearing habitat due to temporary isolation of the work area will be inconsequential because any fish in that area will be relocated to habitat that will provide better rearing conditions, and the scarcity of juvenile salmonids in the mainstem Mattole River means that the quantity of summer rearing habitat is likely not limiting to the population.

2.5.5 Combined Effects

The potential exists for simultaneous construction-related impacts to have a synergistic effect that is greater or different than each stressor acting alone. Simultaneous impacts may include visual impacts from workers and equipment working near or over the water at the same time that fish may be exposed to suspended sediment, for example. However, because combined effects are likely to be of very low intensity, NMFS does not expect any reductions in fitness of salmonids from any combined effects of individual construction elements.

2.6. Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). 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 in the environmental baseline (Section 2.4).

NMFS expects ongoing adverse effects on critical habitat and individual listed salmonids in the action area due to private water withdrawals from shallow wells or directly from tributary streams (NMFS 2016) that may lower the mainstem summer base flow. Lower summer base flows reduce available rearing habitat for juvenile salmonids and holding habitat for summer-run steelhead, and may contribute to higher daytime water temperatures due to lower volume of

water available to moderate daily temperature swings. State and local groups are making focused efforts to reduce the impacts of private water withdrawals, but the related impacts are likely to persist into the near future before measurable benefits accrue.

Other ongoing adverse effects include abnormally high fine sediment and low volumes of large woody debris. These impacts are mainly related to historic timber harvest and timber roads. However, restoration efforts focused on road stabilization and recruitment of large wood are ongoing and are expected to improve habitat conditions in the action area over time.

2.7. Integration and Synthesis

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

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

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

CC Chinook salmon in the action area belong to the Mattole River Population of the North Coastal Diversity Stratum. This population is likely above the depensation threshold and has a low risk of extinction (NMFS 2016).

Winter- and summer-run NC steelhead in the action area belong to the Mattole River Population of the Northern Coastal Diversity Stratum. This population is likely above the depensation threshold and has a low risk of extinction (NMFS 2016).

However, the Recovery Plan describes summer-run NC steelhead as a major life-history type and an important component of the DPS's viability. The California Fish and Game Commission (CFGC 2021) has recently listed summer-run steelhead as an endangered population within the NC steelhead DPS, and NMFS (2016) describes all summer-run populations as being at the highest level of threat due to climate change. Therefore, we pay particular attention to the proposed action's effects to summer-run steelhead in our assessment of the risk posed to NC steelhead as a result of implementing the proposed action.

The cumulative effects of private activities that may occur in the Mattole River watershed, as discussed in the environmental baseline section, may continue to impair, but not preclude the recovery of habitat in the action area. Additionally, due to the nature of the proposed action's

long-term impacts, NMFS does not expect that the proposed action will exacerbate the effects of climate change on salmonids in the action area.

2.7.2 Summary of Effects to Individual Salmonids and Critical Habitat

NMFS anticipates some reduction in the value of SONCC coho salmon, CC Chinook salmon, and NC steelhead designated critical habitat in the action area due to elimination of natural habitat-forming processes over the long-term. NMFS anticipates only minuscule effects to salmonids and their habitats due to construction-related sediment and turbidity, potential chemical contamination during or after construction, and the temporary loss of rearing habitat during construction. However, adverse effects are likely due to capture, handling, and relocation efforts intended to protect CC Chinook salmon and NC steelhead from potential exposure to in-water work activity.

NMFS predicts that up to five juvenile Chinook salmon, 24 juvenile winter-run steelhead, and one juvenile summer-run steelhead could be relocated. Given our estimate of 3% injury or mortality of relocated juvenile salmonids, NMFS expects that no more than one juvenile CC Chinook salmon, one juvenile winter-run NC steelhead, and one juvenile summer-run NC steelhead would be injured or killed during relocation.

Overall Individual and Critical Habitat Effects
NMFS does not expect the loss of one juvenile winter-run and one juvenile summer-run NC steelhead, regardless of cohort, would affect future adult returns. NMFS also does not expect the loss of one juvenile CC Chinook salmon would affect future adult returns. This loss of juveniles would represent a miniscule percentage of the overall number of individuals in each population. The overall number of individuals in the populations will likely provide a compensatory effect. Other areas of the Mattole River watershed are expected to continue to contribute to the populations during the time period when some juveniles in the action area may be harmed or killed as a result of this proposed project. Therefore, NMFS does not expect any appreciable effects on VSP parameters, and thus, the proposed action is not expected to reduce the survival and recovery of the CC Chinook ESU, or the NC steelhead DPS. While the Project is likely to result in some reduction in the value of critical habitats in the action area in the long-term, the reduction is minor, and given the size of the action area in relation to critical habitats as a whole for these species, NMFS concludes the Project is unlikely to appreciably diminish the value of designated critical habitat for the conservation of ESA-listed salmonids.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of 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 CC Chinook salmon or NC steelhead, or destroy or adversely modify designated critical habitat for SONCC coho salmon, CC Chinook salmon, or NC steelhead.

2.9. Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is

defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

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 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 juvenile Chinook salmon and steelhead may occur in the form of pursuit and capture during fish relocation. NMFS expects that no more than one juvenile Chinook salmon, one juvenile winter-run steelhead, and one juvenile summer-run steelhead would be injured or killed during capture and relocation to adjacent habitat, as detailed in sections 2.5.1 and 2.7.2 above.

2.9.2. Effect of the Take

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

2.9.3. Reasonable and Prudent Measures

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

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

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

2.9.4. Terms and Conditions

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

1. The following terms and conditions implement reasonable and prudent measure 1:

    a. Qualified biologists with expertise in the areas of anadromous salmonid biology shall conduct fish relocation activities associated with construction. Caltrans will ensure that all biologists working on the Project are qualified to conduct fish relocation in a manner which minimizes all potential risks to salmonids.
    b. Salmonids shall be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish must be kept in cool, shaded, and aerated water protected from excessive noise, jostling, or overcrowding or potential predators any time they are not in the stream, and fish will not be removed from this water except when released. Captured salmonids will be relocated as soon as possible to an instream location in which suitable habitat conditions are present to allow for adequate survival for transported fish and fish already present. Fish will be distributed between multiple areas if biologists judge that overcrowding may occur in a single area.
    c. If any salmonids are found dead or injured, the biologist will contact NMFS South Coast Branch Supervisor at 707-825-5173 or by email Jeffrey.Jahn@noaa.gov as soon as possible. The purpose of the contact is to review the activities resulting in the take and to determine if additional protective measures are required. All salmonid mortalities will be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location, fork length, and be frozen as soon as possible. Frozen samples will be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS Northern California Office in Arcata, California without obtaining prior written approval from the South Coast Branch Supervisor. Any such transfer will be subject to such conditions as NMFS deems appropriate.

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

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

    b. Caltrans shall contact NMFS within 24 hours of meeting or exceeding take of listed species prior to project completion. Notify Jeff Jahn by phone at 707-825-5173 or via email to Jeffrey.Jahn@noaa.gov. This contact acts to review the activities resulting in take and to determine if additional protective measures are required.

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

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

a. Caltrans shall provide a written report to NMFS by January 15 in each year following construction of the Project. The report shall be sent to NMFS via email to Jeffrey.Jahn@noaa.gov. The reports shall contain, at a minimum, the following information:

Construction related activities -- The report will include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on CC Chinook or NC steelhead, a description of any and all measures taken to minimize those unanticipated effects, and a statement as to whether or not any unanticipated effects had any effect on CC Chinook or NC steelhead; the number of CC Chinook or NC steelhead killed or injured during Project construction; and photographs taken before, during, and after the activity from photo reference points.

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

2.10 Conservation Recommendations

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

NMFS recommends that Caltrans remove larger trees in the access road area with their roots intact, if feasible, and place the trees on the adjacent gravel bar to be captured by the river during seasonal high flows.

NMFS also recommends that existing boulders along the toe of the slope be left in the channel and not be incorporated into the RSP.

2.11 Reinitiation of Consultation

This concludes formal consultation for the Mattole Road PM 5.25 Storm Damage Repair Project. Under 50 CFR 402.16(a): “Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control

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

2.12 "Not Likely to Adversely Affect" Determinations

2.12.1 Action Agency's Effects Determination

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

2.12.2 Effects of the Action

Juvenile and adult SONCC coho salmon migrate through the action area seasonally, but have not recently been found in the lower mainstem of the Mattole River, including the action area, during summer snorkel surveys conducted by MSG (MSG 2018b). The absence of juvenile coho salmon in this reach may be explained by high water temperatures, the long distance upstream where coho salmon typically spawn, the smolt outmigration being typically over by mid-June, and the outright scarcity of coho salmon in the watershed. Additionally, CDFW provided an email (CDFW 2018) to Humboldt County for a project in a nearby upstream location that states: … *based on proposed timing of project implementation (June 15 – October 15) we do not feel that the project is likely to result in State-defined take of coho salmon (catch, capture, kill) because they are highly unlikely to be present during the work window proposed*. Therefore, any effect of the proposed action on individual coho salmon is expected to be discountable, as no individuals are expected to be exposed.

2.12.3 Conclusion

Based on the analyses in both the BA and this opinion, NMFS concurs that the proposed action is not likely to adversely affect individual SONCC coho salmon.

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

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the physical, biological, and chemical properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on

EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH [CFR 600.905(b)]

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

3.1 Essential Fish Habitat Affected by the Project

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

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

3.2 Adverse Effects on Essential Fish Habitat

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

1. Temporary reduction in available habitat due to presence of a river diversion cofferdam.
2. Temporary reduction in water quality caused by increase in suspended sediments and turbidity during construction, and during the first rain events following construction.
3. Temporary loss of riparian vegetation.
4. Permanent loss of course substrate delivery from the stabilized slide.

3.3 Essential Fish Habitat Conservation Recommendations

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

NMFS recommends that Caltrans remove larger trees in the access road area with their roots intact, if feasible, and place the trees on the adjacent gravel bar to be captured by the river during seasonal high flows.

NMFS also recommends that existing boulders along the toe of the slope be left in the channel and not be incorporated into the RSP.

3.4 Supplemental Consultation

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

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this opinion is Caltrans. Other interested users could include CDFW and MSG. Individual copies of this opinion were provided to Caltrans. The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adhere to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

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