



**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**

September 18, 2019

Refer to NMFS No: WCRO-2019-02549

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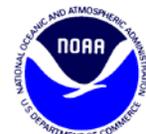
Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for Re-initiation of Consultation on the Van Duzen River Ranch Remediation and Restoration Project in Humboldt County, California (Corps File No. 2013-00208N)

Dear Ms. Meier:

Thank you for your letter of September 11, 2019, requesting re-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 Van Duzen River Ranch Remediation and Restoration Project. Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action. This letter transmits NMFS' final biological opinion and EFH response for Mr. Jack Noble's (Applicant) proposed Van Duzen River Ranch Remediation and Restoration Project (Project).

The enclosed biological opinion describes NMFS' analysis of potential effects on threatened Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), California Coastal (CC) Chinook salmon (*O. tshawytscha*), Northern California (NC) steelhead (*O. mykiss*), and their designated critical habitat in accordance with section 7 of the ESA. Based on the best scientific and commercial information available, NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of SONCC coho salmon, CC Chinook salmon, and NC steelhead or destroy, or adversely modify designated critical habitat for these species. NMFS expects the proposed action would result in incidental take of SONCC coho salmon, CC Chinook salmon, and NC steelhead. An incidental take statement is included with the enclosed biological opinion. The incidental take statement includes non-discretionary reasonable and prudent measures and terms and conditions that are expected to further reduce anticipated incidental take.

The enclosed EFH consultation was prepared pursuant to section 305(b) of the MSA. The proposed action includes areas identified as EFH for coho salmon and Chinook salmon, Pacific Salmon species managed under the Pacific Coast Salmon Fishery Management Plan. Based on our analysis, NMFS concludes that the project would adversely affect EFH for coho salmon and Chinook salmon. The proposed action contains conservation measures to minimize effects to EFH. With these measures, the proposed action contains adequate measures to avoid, minimize,



mitigate, or offset the adverse effects to EFH. Therefore, NMFS has no additional conservation recommendations.

Please contact Matt Goldsworthy, Northern California Office, Arcata, at (707) 825-1621 or via email at Matt.Goldsworthy@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: ARN File# 151422WCR2019AR00196

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

Van Duzen River Ranch Remediation and Restoration Project - Reinitiation of Consultation
Humboldt County, California

NMFS Consultation Number: WCRO-2019-02549

Action Agency: United States Army Corps of Engineers, San Francisco District

Table 1. Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	Is Action Likely To Jeopardize the Species?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Southern Oregon/North California Coast (SONCC) coho salmon (<i>Oncorhynchus kisutch</i>)	Threatened	Yes	No	No
California Coastal (CC) Chinook salmon (<i>O. tshawytscha</i>)	Threatened	Yes	No	No
Northern California (NC) Steelhead (<i>O. mykiss</i>)	Threatened	Yes	No	No

Table 2. Essential Fish Habitat and NMFS' Determinations:

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

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

Issued By: 
Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: September 18, 2019

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1 INTRODUCTION

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

1.1 Background

NOAA's National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402. We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). A complete record of this consultation is on file at the NMFS Northern California Office in Arcata, California.

1.2 Consultation History

On June 11, 2018, the United States Department of Justice filed an amended complaint that brought civil charges against Mr. Jack Noble (Defendant) alleging that the Defendant violated and continues to violate the Clean Water Act and Endangered Species Act. On August 27, 2018, the United States District Court issued an order granting Plaintiff's (United States of America) unopposed motion to enter a Consent Decree (DOJ 2018). The Consent Decree includes the remediation and restoration project that is the subject of this consultation.

On January 30, 2019, NMFS received the Corps request to initiate formal ESA consultation on the Project, as initially proposed, for the proposed issuance of a Clean Water Act Section 404 permit for the Van Duzen River Ranch Remediation and Restoration Project (Corps 2019a). NMFS completed a Biological Opinion on May 23, 2019, which included a term and condition that limited the number of heavy equipment crossings during the wet season (NMFS 2019).

On August 5, 2019, the attorney representing the Applicant notified the Corps of a modification to the proposed action to include 250 heavy equipment crossings during the wet season (Welti 2019). The Applicant was unable to predict exactly when any of the 250 crossings would occur due to the nature of the Applicant's ranching needs.

On September 11, 2019, NMFS received the Corps request to re-initiate formal ESA consultation on the Project for the proposed re-issuance of a Clean Water Act Section 404 permit for the Van Duzen River Ranch Remediation and Restoration Project (Corps 2019b). The Corps modified their Proposed Action to include 250 heavy equipment crossings, as requested by the Applicant. The Corps determined that the updated Project may adversely affect Southern Oregon/Northern California Coast (SONCC) coho salmon, California Coastal (CC) Chinook salmon and Northern California (NC) steelhead, and their designated critical habitats. In addition, the Corps requested to initiate MSA EFH consultation. The consultation was re-initiated on September 11, 2019.

1.3 Proposed Federal Action

“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). For EFH consultation, 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).

The Corps proposes to re-issue a permit pursuant to Section 404 of the Clean Water Act to Mr. Jack Noble (the Applicant), which is set to expire on March 18, 2022. The permit would authorize the remediation and restoration activities described in the Consent Decree (CD), the installation and use of a summer bridge, additional restoration activities to perform a bioengineered design at Site 9, and 250 annual wet crossings outside of the summer season. Remediation and restoration work associated with the Corps permit will occur at twelve sites (nine work sites and three alcove enhancement sites) throughout the Van Duzen River Ranch (VDRR) and is described in detail in the CD (DOJ 2018). Work at most of the sites involves heavy equipment located on or in the river bed, while all other work will be done from the top of the bank. Dewatering will be required at Site 9 to complete the bioengineering work and may be also be required at other sites depending on site conditions during the work season.

1.3.1 Remediation and Restoration Actions

The proposed remediation and restoration activities will occur in two or three summer work windows and include: removal of approximately 1,855 cubic yards (cy) of concrete rock-slope-protection (RSP) blocks, miscellaneous car bodies, and metal debris along the bed and banks of the Van Duzen River; revegetation of approximately 9,230 square feet of disturbed areas at Sites 2, 3, 4, 5, 7, and 9; re-contouring of the banks of the Van Duzen River at Sites 3 and 9 to achieve an average 3.5:1 slope; bioengineering design which incorporates approximately 12 old growth redwood stumps at Site 9; enhancement of the alcove at Site 2; and placement of 75 or more pieces of woody debris to perform habitat enhancement of alcove habitat at Sites 1, 2, 3 and 7. Erosion control will be employed to minimize erosion and sediment transport from disturbed areas. Concrete and metal debris will be hauled to a stable location in the Applicant’s stockyard using existing roads. The Applicant may collect large woody debris, or other woody debris, from adjacent gravel bars in order to provide additional wood for the planned projects.

Site Summaries

Site 1: Remove approximately 230 cy of concrete rubble, five car bodies, and remove the upstream groin/point. Most concrete can be removed by equipment working from dry areas, but some concrete will require the excavator to remove them from the water.

Site 2: Remove approximately 60 cy of concrete rubble and 8 pieces of scrap metal. Revegetate a barren 2,500 ft² area as well as any other areas larger than 30 ft² that are observed to lack trees.

Site 3: Remove approximately 460 cy of concrete rubble from the upper 80% of the bank to avoid blocks surrounded by dense riparian vegetation in the lower portion of the bank. Excavate 730 cy of exposed bank to reduce the slope to 3.5:1 gradient. Revegetate the 20,970 ft² of the exposed 3.5:1 floodplain bank with approximately 400 trees.

Site 4: Remove approximately 250 cy of concrete rubble and other debris from the full extent of the site. However, concrete blocks or debris will not be removed if a cottonwood or willow tree greater than 8-inches in diameter will be destroyed. Areas of bare soil greater than 30 ft² in aerial extent will be revegetated.

Site 5: Remove approximately 350 cy of concrete rubble and other debris from the full extent of the site. However, concrete blocks or debris will not be removed if a cottonwood or willow tree greater than 8-inches in diameter will be destroyed. Areas of bare soil greater than 30 ft² in aerial extent will be revegetated.

Site 6: Remove approximately 130 cy of concrete rubble and other debris.

Site 7: Remove approximately 70 cy of concrete rubble and other debris; revegetate or plant 1,200 ft² of barren, exposed or disturbed areas. Rebar and steel will also be removed.

Site 8: Remove approximately 30 cy of concrete rubble and other debris.

Site 9: Remove approximately 290 cy of concrete rubble and metal debris; excavate approximately 380 cy; revegetate and plant 7,000 ft² area. The current eroding bank is lined with RSP and will be redesigned to incorporate a bioengineered approach that incorporates several pieces of large woody debris and approximately 12 old growth redwood stumps. In order to implement the bioengineered design, the work area will need to be dewatered by constructing a water collecting channel which will house a sump pump to drain the water. Turbidity curtains will be used to control turbidity. The portion of Fisher Road near the eroding bank will be relocated further upslope to provide more space to accommodate the slope of the bioengineered design.

Alcoves: A minimum of 90 pieces of large woody debris will be used to enhance three alcoves (30 pieces placed in each alcove).

1.3.2 Summer Bridge Crossing

The Corps permit would allow for the installation and use of a summer bridge in the Van Duzen River from June 15 to October 31 each year. In order to install the bridge, approximately 50 cy of fill beneath the ordinary high water line will be required for the bridge abutments and up to 2 single crossings (one round trip) of the low flow channel by heavy equipment to install the bridge. The bridge will consist of two 33-foot long flatcars placed side by side over the channel that will be elevated above the active river bed on 1-foot x 1-foot concrete beams. PWA will provide biological personnel to monitor the installation of the summer bridge to ensure that no fish or amphibians are impacted. The summer bridge may be installed on or after June 15 and would be removed by October 31. Upon removal, the fill used for the abutments will be redistributed into the source bed. The summer bridge is expected to be used during each year of the permit duration.

1.3.3 Wet Season Crossings

The Corps proposes to authorize the Applicant to cross the Van Duzen River with heavy equipment from October 15 to June 15 annually. The Applicant anticipates as many as 250 wet

crossings (250 round trips or 500 individual passes) over the Van Duzen River each year of the remaining permit duration. The permit expires on March 18, 2022, and there are 250 crossings expected the final wet season (October 15, 2021 to March 18, 2022). The 8 emergency crossings identified in the CD (DOJ 2018) are included in the 250 annual wet crossings being authorized. The Applicant indicated he will use the same crossing location and cross at slow speed in order to minimize effects to listed species.

1.3.4 Interrelated and Interdependent Actions

“Interrelated actions” are those that are part of a larger action and depend on the larger action for their justification. “Interdependent actions” are those that have no independent utility apart from the action under consideration (50 CFR 402.02). There are no interrelated or interdependent actions associated with the proposed action.

2 ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

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

2.1 Analytical Approach

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

This biological opinion relies on the definition of "destruction or adverse modification," which “means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features” (81 FR 7214; February 11, 2016).

The designations of critical habitat for species addressed in this opinion used the terms primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414; February 11, 2016) replace these terms with physical or biological features (PBFs). The shift in

terminology does not change the approach used in conducting a “destruction or adverse modification” analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

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

- Identify the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an “exposure-response-risk” approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) Reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.
- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- If necessary, suggest a RPA to the proposed action.

Updates to the regulations governing interagency consultation (50 CFR part 402) will become effective on September 26, 2019 (84 FR 44976, August 27, 2019). Because this consultation was pending and will be completed prior to that time, we are applying the previous regulations to the consultation. However, as the preamble to the final rule adopting the new regulations noted, “[t]his final rule does not lower or raise the bar on section 7 consultations, and it does not alter what is required or analyzed during a consultation. Instead, it improves clarity and consistency, streamlines consultations, and codifies existing practice.” Thus, the updated regulations would not be expected to alter our analysis.

2.1.1 Informational Limitations and Assumptions

The Applicant was unable to predict what dates or frequency the 250 heavy equipment crossings would occur during the wet season due to the episodic and unplanned nature of the crossings. The Applicant indicated that most of the crossings occur before and after the heaviest rainfall that occurs during the winter period, although emergency needs may arise at any time. Because of the uncertainty of when the wet crossings would actually occur, and at what frequency they might occur (i.e. one crossing per day throughout the entire period or twenty crossings per day episodically) we have to rely on an assumption about exposure of listed species. Therefore, NMFS will rely on the percent area occupied metric identified in Mikus and Powers 2016, which will utilize a standard exposure rate applied throughout the entire wet season. The Mikus and Powers (2016) percent area occupied metric was based on summer season captures and therefore would be expected to be an under-estimate for the wet season, when temperatures and depths are no longer limiting factors. Despite likely being an underestimate for the wet season, Mikus and Powers (2016) presents the most recent information on species presence in the Van Duzen River

watershed, including from the action area. Most other information is limited to habitat quality and not based on actual captures of fish.

2.2 Rangewide Status of the Species and Critical Habitat

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' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. 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 current function of the essential PBFs that help to form that conservation value.

2.2.1 Species Description and General Life History

2.2.1.1 SONCC Coho Salmon

Coho salmon have a generally simple 3-year life history. The adults typically migrate from the ocean and into bays and estuaries towards their freshwater spawning grounds in late summer and fall, and spawn by mid-winter. Adults die after spawning. The eggs are buried in nests, called redds, in the rivers and streams where the adults spawn. The eggs incubate in the gravel until fish hatch and emerge from the gravel the following spring as fry. These 0+ age fish typically rear in freshwater for about 15 months before migrating to the ocean. The juveniles go through a physiological change during the transition from fresh to salt water called smoltification. Coho salmon typically rear in the ocean for two growing seasons, returning to their natal streams as 3-year-old fish to renew the cycle.

2.2.1.2 CC Chinook Salmon

CC Chinook salmon 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. Therefore, Chinook salmon typically enter the estuary as smaller fish compared to coho salmon. Chinook salmon are typically present in the stream-estuary ecotone, which is located in the downstream portions of major tributaries to estuaries like Humboldt Bay, from early May to early September, with peak abundance in June/July (Wallace and Allen 2007). Similar to coho salmon, prey resources during out-migration are critical to Chinook salmon survival as they grow and move out to the open ocean. A study by MacFarlane (2010) indicated that juvenile Chinook salmon require less prey in the estuary, equivalent to one northern anchovy (*Engraulis mordax*) per day, compared to a range of one to four anchovies needed per day in the ocean.

2.2.1.3 NC Steelhead

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

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

2.2.2 Status of Species and Critical Habitat

In this biological opinion, NMFS assesses four population viability parameters to help us understand the status of each species and their ability to survive and recover. These population viability parameters are: abundance, population productivity, spatial structure, and diversity (McElhane et al. 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information, including the Recovery Plan for SONCC Coho Salmon (NMFS 2014) and Coastal Multispecies Recovery Plan (NMFS 2016), to determine the general condition of each population and factors responsible for the current status of each Distinct Population Segment (DPS) or Evolutionarily Significant Unit (ESU). We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.02).

2.2.2.1 Status of SONCC Coho Salmon

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

SONCC Coho Salmon Spatial Structure and Diversity: The distribution of SONCC coho salmon within the ESU is reduced and fragmented, as evidenced by an increasing number of previously occupied streams from which SONCC coho salmon are now absent (NMFS 2001, Good et al.

2005, Williams et al. 2011, Williams et al. 2016). Extant populations can still be found in all major river basins within the ESU (70 FR 37160; June 28, 2005). However, extirpations, loss of brood years, and sharp declines in abundance (in some cases to zero) of SONCC coho salmon in several streams throughout the ESU indicate that the SONCC coho salmon's spatial structure is more fragmented at the population-level than at the ESU scale. The genetic and life history diversity of populations of SONCC coho salmon is likely very low and is inadequate to contribute to a viable ESU, given the significant reductions in abundance and distribution.

2.2.2.2 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' conclusion that CC Chinook salmon are likely to become an endangered species within 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 stratum¹, as well as poor ocean survival contributed to the conclusion that CC Chinook salmon are likely to become an endangered species 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.

2.2.2.3 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

¹ A diversity stratum is a grouping of populations that share similar genetic features and live in similar ecological conditions.

populations exist in Redwood Creek and the Mad, Eel (Middle Fork) and Mattole Rivers. The abundance of summer-run steelhead was considered “very low” in 1996 (Good et al. 2005), indicating that an important component of life history diversity in this DPS is at risk. Hatchery practices in this DPS have exposed the wild population to genetic introgression and the potential for deleterious interactions between native stock and introduced steelhead. However, abundance and productivity in this DPS are of most concern, relative to NC steelhead spatial structure and diversity (Williams et al. 2011).

2.2.2.4 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: logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Impacts of concern include altered stream bank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality, lost riparian vegetation, and increased erosion into streams from upland areas (Weitkamp et al. 1995). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESU’s and DPS. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

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

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

One factor affecting the range wide status and aquatic habitat at large is climate change. Information since these species were listed suggests that the earth’s climate is warming, and that this change could significantly impact ocean and freshwater habitat conditions, which affect survival of species subject to this consultation. In the coming years, climate change will influence the ability to recover coho and Chinook salmon in most or all of their watersheds. Steelhead are particularly vulnerable to climate change due to their need for year-round cool

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

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

2.3 Action Area

“Action area” means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the project encompasses approximately 1.8 linear miles of the Van Duzen River, including all bed, bank, and channel areas, in addition to all riparian areas located immediately adjacent to those areas, and approximately 250 linear feet downstream where temporary increases in turbidity may occur.

2.4 Environmental Baseline

The “environmental baseline” includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

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

High water temperatures greatly limit the quality and quantity of suitable summer rearing habitat, and the action area is predominantly a migratory corridor for adult and smolt life stages, as well as winter rearing habitat for juvenile life stages during the wet season. Older age classes of steelhead can be found in cooler microhabitats throughout the summer, generally near riffles. The composition of the substrate in the action area is primarily cobble, gravel, and associated fines (silt/clay particles), typical of streams found in this area. The watershed consists of soils that are prone to erosion. Riparian vegetation capable of providing shade to the Van Duzen River is rather limited given the width of the channel and floodplain areas.

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

Coho salmon occurring in the action area belong to the Lower Eel/Van Duzen River population of SONCC coho salmon, which is considered extremely depressed and at a high risk of extinction (NMFS 2014). Chinook salmon in the action area belong to the Lower Eel/South Fork population, which NMFS Coastal Multispecies Recovery Plan suggests is likely well below the number needed (2,186 adults, NMFS 2016) to be at a low risk of extinction. Steelhead in the action area belong to the Van Duzen River population of NC steelhead, which is also likely well below the number needed (6,340 adults, NMFS 2016) to be at a low risk of extinction. “Channel Modification” was listed as one of the highest threats to NC steelhead and CC Chinook, while channelization/diking was identified as one of the key limiting threats to juvenile SONCC coho salmon in the Van Duzen River (NMFS 2014).

The condition of SONCC coho salmon, CC Chinook salmon and NC steelhead critical habitat, specifically its ability to provide for their conservation, is degraded from conditions known to support viable populations. The reach of the Van Duzen River within the action area is very wide and shallow, with almost no pool habitat. Past gravel mining activities, which skimmed and removed the height of the gravel bars, have likely contributed to this poor condition. Within the action area, a significant portion of the banks of the Van Duzen River have been armored with concrete rubble and debris, which has contributed to the preclusion of natural fluvial and geomorphic processes that form habitat. Natural streambanks provide velocity refuge and prey resources while steeper banks lined with rock or other hard materials do not provide refuge and are preferred habitats for predators, such as the non-native pikeminnow.

The Van Duzen River’s water temperature consistently remains in the stressful to lethal range for salmonids during the summer (NMFS 2014, NMFS 2016). The action area does not include deep pool habitat that would provide thermal stratification, nor is there significant cool tributary inflow into the action area. Springs or seeps below the low-flow waterline may provide a limited number of cool water microhabitats during this time period. Water flowing interstitially through gravel deposits provides the greatest amount of cool water inflow during the summer months. Juvenile steelhead may be found near these cool inputs. Shade provided by overhanging vegetation is a favorable means of reducing water temperatures; however, during the low flow summer months these conditions do not exist in the action area, providing little opportunity for cover.

The operation of the Applicant's ranch requires crossing the Van Duzen River with various vehicles, with and without a summer bridge, at any time of the year. As required by the CD, the Applicant provided nine notifications of multiple daily crossings planned to occur over 38 days from October 15, 2018 to December 8, 2018. Based on the number of vehicles and number of days reported in each of the notifications, the Applicant may have made an estimated 90 round trips (seven round trips being heavy equipment) through the Van Duzen River from October 15 to December 8, 2018. Heavy equipment crossings may have a much higher likelihood of crushing and killing juveniles as compared to other vehicles because heavy equipment is able to cross during the highest flows, which coincides with when exposure of listed species is highest. These crossings are expected to continue until March 18, 2022, as part of the Corps proposed action.

2.4.2 Previous ESA Section 7 Consultations and Research Approvals in the Action Area

The Applicant has applied to participate in the Corps gravel mining program for Humboldt County, under the Corps LOP-2015 permit. The Applicant cannot be approved to participate in the LOP until the CD has been executed and all past violations cleared. The Applicant had applied and temporarily operated under the Corps LOP-2009 for gravel mining before discontinuing participation. Both programs for gravel mining anticipated that small numbers of salmonid listed species would be harmed, injured, or killed during gravel mining activities. Stream restoration actions under programmatic consultations may take place in the action area. These programmatic consultations include the NOAA Restoration Center's (RC) restoration program, and the Regional General Permit 12 programmatic consultation with the California Department of Fish and Wildlife (CDFW). These consultations anticipate a limited amount of take for juvenile salmonids during instream work conducted in the summer months. NMFS determined these restoration actions are likely to improve habitat conditions for listed species and that the limited amount of take anticipated is unlikely to affect future adult returns. NMFS' ESA Section 10(a)(1)(A) research and enhancement permits and research projects in the annual CDFW ESA Section 4(d) rule research program could potentially occur in the Van Duzen River watershed, including the reaches within the action area. Salmonid monitoring approved under these programs includes carcass surveys, seining for adult speciation, and juvenile surveys. In general, these activities are closely monitored and require measures to minimize take during the research activities. NMFS determined these research projects are unlikely to affect future adult returns.

2.5 Effects of the Action

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

2.5.1 Turbidity and Contaminants

Brief periods of turbidity are expected extending as far as 250-feet downstream of the bridge crossing location and at all work sites during removal of concrete rubble and debris or

dewatering. Turbidity is expected to be limited to several hours per day at each work site, or for several days at Site 9. Proposed minimization measures are expected to ensure both erosion and turbidity are minimized and negligible. Contaminants from heavy equipment will be managed in accordance with the proposed minimization measures. Based on these measures, exposure of listed species and critical habitat to contaminants is improbable.

2.5.2 Crushing

Although the action area has unsuitable water temperatures most of the summer, June and October are transition months and often cooler and within suitable ranges to accommodate the presence of juvenile or adult salmonids. Therefore, juvenile life stages will be exposed and potentially injured or crushed by heavy equipment during wet crossings to install and remove the summer bridge, during wet season crossings of the river, and during instream work to conduct restoration activities such as at Site 1 and 9. Depending on the timing of the onset of fall rains, adult life stages might be present during the removal of the bridge in late October if the bridge is not removed prior to rainfall. All life stages will be exposed to the proposed wet season wet crossings. Juveniles are expected to be injured and killed in high numbers during the proposed wet season crossings. Most often, adults are expected to be present in areas where wet season crossings would not occur (i.e., deeper water) and any adults migrating through shallow runs or riffles are expected to avoid crushing during the wet season due to their relatively fast swimming speed as compared to the slow progression of heavy equipment.

Mikus and Powers (2016) present a summary of fish surveys conducted in the Lower Eel and Van Duzen Rivers during the summers of 2013, 2014, and 2015. Therefore, the available data is based upon summer captures of juvenile SONCC coho salmon, CC Chinook salmon, and NC steelhead (Mikus and Powers 2016), which likely result in a significant under-estimate of actual fish densities expected to have been present during the peak outmigration season of these species (February to June). Mikus and Powers (2016) found that the average percent area occupied over the course of their three year study for SONCC coho salmon was 5%; CC Chinook salmon was 4%; and NC steelhead was 50%, although we use 20% because of the expected avoidance behavior of older ages of steelhead (20% represents the proportion of steelhead present that are expected to be of younger age, such as 0+ or 1+ age classes).

2.5.2.1 Wet Crossings for Summer Bridge and Instream Remediation Work

Two wet crossings (four passes) through the Van Duzen River would occur to install the summer bridge in June, when juvenile SONCC coho salmon, CC Chinook, and NC steelhead life stages are present. Two wet crossings through the Van Duzen River would occur in October to remove the bridge, when juvenile NC steelhead and adult CC Chinook salmon may be present. NMFS also anticipates adult CC Chinook salmon may be exposed to removal activities during years when rainfall may arrive earlier than usual. With two more wet crossings in 2019 and four wet crossings each year in 2020 and 2021 (and each wet crossing constituting two passes through the water) over the remaining duration covered by the proposed permit (expiring March 18, 2022), there will be 20 individual passes through the wetted channel to install and remove the summer bridge, representing 20 opportunities to crush an individual. NMFS anticipates a small percentage of these wet crossings will injure or crush juvenile SONCC coho salmon, CC

Chinook, and NC steelhead and the actual amount will vary seasonally and annually. NMFS anticipates steelhead will be exposed to the effects of crushing at a much higher proportion of the wet crossings given they will be exposed to twice the number of wet crossing events, and are also present in higher abundance given their tolerance of warmer water.

The remediation work proposed in the Corps permit at all of the sites may also require disturbance to the wetted channel during the late summer when a limited number of NC steelhead juveniles may be present. The dewatering work at Site 9 may require equipment entry or work in the live channel, where any juvenile NC steelhead present may be exposed to equipment working and be injured or crushed. Equipment may need to work from wetted portions of the live channel, thus exposing juvenile life stages. Most of the instream work will occur after August, when stream temperatures are high and species presence should be limited.

Crushing of juvenile SONCC coho salmon is anticipated during the June installations (8 passes x 5% likelihood = one individual crushed and killed over two remaining June installations (rounding up to one for a more conservative estimate)). Crushing of CC Chinook is anticipated during the June installations (8 passes x 4% likelihood = one individual crushed and killed over 2 remaining June installations (rounding up to one for a more conservative estimate)). Crushing of NC steelhead is anticipated during both the installation (June) and removal (October or November) activities (20 passes x 20% likelihood = 4 individuals crushed and killed over the remaining duration of the permit). Three steelhead juveniles are also expected to be crushed and killed during the instream work and dewatering associated with the remediation work sites. Work at several sites may require equipment work in the wetted channel, where low numbers of juvenile NC steelhead may be present. Site 9 will require dewatering and instream work that is expected to crush two individuals, while the work planned at the other sites is expected to crush one individual.

2.5.2.2 Wet Crossings during the Wet Season

The summer bridge is required to be removed by October 31, and the Applicant intends to cross the Van Duzen River without a bridge (wet crossing) from October 15 to June 15 (DOJ 2018). Over the remaining permit duration, there may be 750 wet crossings of heavy equipment during the wet season (250 wet crossings during each of the three remaining wet seasons).

All of these wet season crossings occur when species presence in the action area is at the highest (November through June), thus exposing larger numbers of listed species to being injured and crushed with limited ability to avoid the equipment given high turbidity and acoustics at these times. The wet season is also when juvenile CC Chinook fry are associated with edgewater, leaving them vulnerable to crushing. NMFS anticipates a high percentage of the wet crossings that occur during the wet season to injure and crush some juveniles (alevins, fry, yoy, parr) from all three listed species.

Crushing of juvenile SONCC coho salmon is anticipated during the 750 wet crossings (1,500 passes x 5% likelihood = 75 individuals crushed and killed over three wet seasons). Crushing of CC Chinook is anticipated during the 750 wet crossings (1,500 passes x 4% likelihood = 60 individuals crushed and killed over three wet seasons). Crushing of NC steelhead is anticipated

during the 750 wet crossings (1,500 passes x 20% likelihood = 300 individuals crushed and killed over three remaining wet seasons).

2.5.3 Long-Term Effects

Concrete blocks, concrete rubble, car bodies, and other metal debris will be removed in part or in full from all Sites. Upon removal of the concrete and metal debris, NMFS expects more juveniles of listed species to reside in the action area during winter and spring months into the future, as these species prefer natural banks over hardened banks (Michny 1989, Peters et al. 1998, U.S. Fish and Wildlife Service 2000). At Site 9, banks armored with a combination of rip rap and concrete rubble and debris will be replaced with a bioengineered structure containing large live redwood rootwads, or be returned to a natural condition without concrete rubble, debris, or quarry rock. Three alcoves will be enhanced and augmented with large woody debris.

Repeated crossings using heavy equipment may also compact the substrate, and decrease the probability of spawning or reduce survival of developing embryos in the event adult fish spawn within a compacted area. The remediation and restoration work will disturb a large area and remove smaller riparian vegetation in some cases. However, riparian vegetation is expected to quickly recolonize once obstructions to its growth, such as concrete rubble, are removed. Additionally, the Corps permit requires a replanting plan which will promote improvements into the future. NMFS anticipates the value of critical habitat will improve once the bank structures are removed and the natural fluvial habitat forming processes are allowed to resume. Therefore, NMFS expects long term improvements to the quality or quantity of critical habitat.

2.5.4 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. Most potential project impacts would not occur simultaneously and would be expected to occur at different times. For example, remediation work will occur during the summer months while the wet season wet crossings will occur during the winter and spring. Because combined effects are either unlikely or of very low intensity, NMFS does not expect any reductions in listed salmonid fitness or degradation to critical habitat 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).

SONCC coho salmon, CC Chinook salmon, and NC steelhead in the action area are likely to be affected by future, ongoing non-federal activities like cannabis cultivation, water diversion, and timber harvest, both from upstream sources and within the action area. Cannabis cultivation requires forests to be cleared and water to be diverted from streams or otherwise removed to irrigate crops, contributing to diminished stream flow and higher water temperatures. Water diversion for other uses also contributes to diminished stream flows and warmer water temperatures. The future effects of timber harvest include continued land disturbance, road construction and maintenance, and higher rates of erosion and sedimentation.

2.7 Integration and Synthesis

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

SONCC coho salmon, CC Chinook salmon, and NC steelhead have all declined to a large degree from historic numbers. CC Chinook salmon have fragmented population structures, placing them at additional risk. Summer run populations of NC steelhead are in very poor condition. Due to the timing of the Project, NMFS expects only a limited number of adult CC Chinook salmon to be present during some years and the abundance of juvenile life stages of all three species in the action area is low during the summer bridge and remediation components of the Project. As described in the Effects of the Action section, a small number of juveniles of all three species may be crushed during wet crossings during the summer.

However, the wet season crossings over the Van Duzen River will occur during periods of high abundance of both juvenile and adult life stages. The period from November to June coincides with cooler water temperatures, heavy rainfall, and both the downstream smolt and upstream adult migrations. The wet season crossings also occur when embryonic life stages may be developing in redds within the action area. A high percentage of the wet season crossings will injure or kill juveniles. Outside of the action area, each of these species continues to be present in the Van Duzen River watershed and other Eel River tributaries. Due to the relatively large number of juveniles produced by each spawning pair, spawning by each of these species in the broader population areas of the Van Duzen and Eel River in future years would be expected to produce enough juveniles to replace any that are lost at the project site due to crushing. The loss of individuals is also expected to occur episodically throughout the remaining duration of the permit, which helps ameliorate the losses for each population exposed. NMFS does not expect that the loss of juveniles by this project would impact future adult returns for SONCC coho salmon, CC Chinook salmon, or NC steelhead.

The action area could be subject to higher average summer air temperatures and lower total precipitation levels due to climate change. Higher air temperatures would likely warm stream temperatures. Reductions in the amount of precipitation would reduce stream flow levels and

estuaries may also experience changes in productivity due to changes in freshwater flows, nutrient cycling, and sediment amounts. For this project, all construction activities would be completed by 2022 and the likely long term effects of climate change described above are unlikely to be detected within that time frame. The short-term effects of project construction would have completely elapsed prior to these climate change effects. Overall, the project is unlikely to appreciably reduce the likelihood of survival and recovery of SONCC coho salmon, CC Chinook salmon, and NC steelhead, and the project is unlikely to appreciably diminish the value of designated critical habitat for the conservation of these species.

2.8 Conclusion

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

2.9 Incidental Take Statement

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

2.9.1 Amount or Extent of Take

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

Summer Bridge and Instream Remediation Work

Take of one juvenile SONCC coho salmon, one juvenile CC Chinook salmon, and 7 juvenile NC steelhead is expected over the remaining permit duration due to crushing during the installation and removal of the summer bridge and instream remediation work.

Wet Crossings during the Wet Season

Take of 75 juvenile SONCC coho salmon, 60 juvenile CC Chinook salmon, and 300 juvenile NC steelhead is expected over the remaining permit duration due to crushing during the wet crossings.

Total Amount of Take

Combined, there are 76 individual SONCC coho salmon; 61 individual CC Chinook salmon; and 307 individual NC steelhead expected to be crushed and killed by the Project over the remaining permit duration.

2.9.2 Effect of the Take

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

2.9.3 Reasonable and Prudent Measures

“Reasonable and prudent measures” are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02). NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of SONCC coho salmon, CC Chinook salmon, and NC steelhead:

1. Ensure construction methods, minimization measures, and monitoring are properly implemented during construction.
2. Prepare and submit an annual report regarding the summer bridge installation and removal at each crossing location.
3. Minimize the amount of take associated with wet season crossings.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the Corps or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The Corps 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. The Applicant 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. The Applicant shall contact NMFS within 24 hours of meeting or exceeding take of listed species prior to project completion. Notify Matt Goldsworthy by phone at 707-825-1621 or email at Matt.Goldsworthy@noaa.gov. NMFS will review the activities resulting in take and determine if additional protective measures are required.
 - c. The Applicant shall monitor incidental take during the activities likely to cause take. The Applicant, Pacific Watershed Associates, or any other Project contractor for the Applicant that is approved by NMFS shall observe the affected area during and after all wet crossings and instream remediation work to monitor for incidental take (injured or dead listed fish).

2. The following terms and conditions implement reasonable and prudent measure 2:
 - a. The Applicant shall provide a written report to NMFS by September 30 of each year. The report shall be sent to NMFS via email to Matt.Goldsworthy@noaa.gov or via mail to Matt Goldsworthy at 1655 Heindon Road, Arcata, California 95521. The report shall contain, at a minimum, the following information:
 - i. **Installation and Removal of Summer Bridge** – document the number of wet crossings during both installation and removal and a photo of the (installed) summer bridge.
 - ii. **Wet Crossing Activities** – document the number of wet crossings that occur during the times when a summer bridge is not installed. The report shall include the number of heavy equipment wet crossings that occurred each month.
 - iii. **Monitoring Incidental Take** – document the results of the incidental take monitoring conducted as part of reasonable and prudent measure 1.
3. The following terms and conditions implement reasonable and prudent measure 3:
 - a. The Applicant shall limit the annual number of round trip wet crossings of heavy equipment in the October 15 to June 15 wet season, whether an emergency or planned, to 250 round trips across the river when not using a permitted summer bridge.

2.10 Conservation Recommendations

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

2.11 Reinitiation of Consultation

This concludes re-initiation of formal consultation for the Van Duzen River Ranch Remediation and Restoration Project. As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

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

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”

Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the Corps and descriptions of EFH for the Pacific Coast Salmon Fishery Management Plan (FMP) developed by the Pacific Fisheries Management Council (PFMC 2014) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

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

The Pacific Coast Salmon FMP contains EFH that will be adversely affected by the Project. Furthermore, the project is located in a Habitat Area of Particular Concern (HAPC) for federally managed fish species (Chinook and coho salmon) under the Pacific Coast Salmon FMP. HAPC are described in the regulations as subsets of EFH that are identified based on one or more of the following considerations: the importance of the ecological function provided by the habitat; the extent to which the habitat is sensitive to human-induced environmental degradation; whether, and to what extent, development activities are, or will be stressing the habitat type; and the rarity of the habitat type (50 CFR 600.815(a)(8)). Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process. One of the HAPC that was developed as part of the Pacific Coast Salmon FMP is spawning habitat. In drought or lower flow years, Chinook salmon may spawn in the action area and experience poor spawning conditions where substrates are compacted. The HAPC developed for spawning habitat will be

adversely affected due to both compaction and from exposure to crushing during the anticipated crossings through the river. The complex channel and floodplain HAPC will also be affected, but generally improved upon removal of concrete rubble and debris.

3.2 Adverse Effects on Essential Fish Habitat

Both Chinook salmon and coho salmon are expected to occur seasonally within the action area. The effects to coho salmon and Chinook salmon critical habitat have already been described in the Effects of the Action section. The adverse effects to EFH in the action area include:

1. Temporary reduction in water quality caused by increase in suspended sediments and turbidity.
2. Exposure of managed species to crushing and killing during summer and wet season crossings.
3. Compaction of potential spawning substrates due to repeated crossings.

3.3 Essential Fish Habitat Conservation Recommendations

Most of the adverse effects from the proposed action are temporary and minor, with the exception of the wet crossings proposed during the wet season. As described in the Effects of the Action section, as many as 1,520 passes by heavy equipment through EFH in the river might occur over the remaining duration of the anticipated Corps permit. Combined, there are 76 individual SONCC coho salmon; 61 individual CC Chinook salmon; and 307 individual NC steelhead that NMFS expects to be crushed and killed by the Project over the remaining permit duration, and NMFS believes there is potential to compact the substrate in the area designated for wet crossings during the wet season. The proposed action contains conservation measures to minimize effects to EFH. With these measures, the proposed action contains adequate measures to avoid, minimize, mitigate, or offset the adverse effects to EFH. Therefore, NMFS has no additional conservation recommendations.

3.4 Supplemental Consultation

The Corps 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(1)).

4 DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this opinion is the U.S. Army Corps of Engineers. Other interested users could include the Applicant, United States

Department of Justice, and California Department of Fish and Wildlife. A copy of this opinion was provided to the Corps. The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

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