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

May 17, 2021 **Refer to NMFS No:** WCRO-2021-00430

Sahrye Cohen
North Branch Chief, Regulatory Division
U.S. Department of the Army
Corps of Engineers, San Francisco District
450 Golden Gate Avenue
San Francisco, California 94102

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Russian River Summer Crossing at Vacation Beach in Guerneville, California

Dear Ms. Cohen;

Thank you for your letters of March 3 and May 6, 2021, 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.). The U.S. Army Corps of Engineers (COE) has received an application from the County of Sonoma Department of Transportation and Public Works for a permit pursuant to Section 404 of the Clean Water Act of 1972 (CWA) (as amended, 33 U.S.C. 1344 et seq.) to place fill in 0.28 acres of jurisdictional waters of the United States each summer for 10 years for the purpose of providing vehicular access for emergency services, local residents, recreational users, and tourists at a summer road crossing over the Russian River at Vacation Beach, near the town of Guerneville in Sonoma County, California.

In this biological opinion, we conclude that the proposed action is not likely to jeopardize the continued existence of the federally endangered Central California Coast (CCC) coho salmon (*Oncorhynchus kisutch*), or the threatened CCC steelhead (*O. mykiss*) and California Coastal (CC) Chinook salmon (*O. tshawytscha*). We also conclude the proposed action is not likely to result in the destruction or adverse modification of designated critical habitat for these listed species. However, NMFS anticipates that incidental take of all three species is reasonably certain to occur as a result of the proposed action. Therefore, an incidental take statement with non-discretionary terms and conditions is included with the enclosed biological opinion.

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. Based on NMFS' review of the likely effects of the proposed action on EFH, the proposed action will occur within an area identified as EFH managed under the Pacific Coast Salmon Management Plan. The proposed action includes design, staging, monitoring, and adaptive management strategies to avoid or minimize potential adverse effects to EFH. Thus, no additional EFH conservation recommendations are provided.

Please contact Jodi Charrier of the California Coastal Office in Santa Rosa at 707-575-6069 or jodi.charrier@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: Jayme Ohlhaver, USACE, Jayme.a.ohlhaver@usace.army.mil
Copy to E-File: ARN 151422WCR2021SR00059

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

Vacation Beach Summer Crossing

NMFS Consultation Number: WCRO-2021-00430
Action Agency: U.S. Army Corps of Engineers

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?
Central California Coast Coho Salmon (*Oncorhynchus kisutch*)	Endangered	Yes	No	Yes	No
Central California Coast Steelhead (*O. mykiss*)	Threatened	Yes	No	Yes	No
California Coastal Chinook Salmon (*O. tshawytscha*)	Threatened	Yes	No	Yes	No

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

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: May 17, 2021

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1. INTRODUCTION

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

1.1. Background

NOAA's National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the ESA of 1973 (16 U.S.C. 1531 et seq.), and implementing regulations at 50 CFR 402, as amended. We also completed an EFH consultation on the proposed action, in accordance with section 305(b)(2) of the 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 (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 NMFS' North-Central Coast Office in Santa Rosa, California (ARN #151422WCR2021SR00059).

1.2. Consultation History

During the week of April 27, 2020**,** the U.S. Corps of Engineers (COE) and the County of Sonoma Department of Transportation and Public Works (the County) conducted a site visit at the Asti Summer Crossing over the Russian River with NMFS where proposed timing and construction methods for both the Asti and Vacation Beach Summer Crossings were discussed.

On December 29, 2020, the COE emailed NMFS requesting a one-year time extension for the NMFS opinion with the COE for a *Ten Year Permit for the Annual Installation and Removal of Two Summer road Crossings in the Lower Russian River: Odd Fellows Road Crossing and Vacation Beach Road Crossing in Sonoma County, California* (2009 opinion, expired December 31, 2020, COE file #2002-273010N, NMFS file #2009/09020).. The COE also acknowledged that two new recovery plans [*Final Recovery Plan for the Central California Coast Coho* (NMFS 2012) and the *Coastal Multispecies Recovery Plan. California Coast Chinook salmon, Northern California Steelhead, Central California Coast Steelhead* (NMFS 2016)] were published since the 2009 opinion. This email also contained the Biological Assessment (BA) for the proposed crossing.

On January 21, 2021, NMFS emailed the COE requesting clarification on what action the COE was requesting of NMFS in their December 29, 2020 email.

On January 22, 2021, the COE emailed NMFS explaining that the previous email and BAs were sent as early coordination and asked for guidance on best way to proceed with Section 7 consultation given timing constraints.

On January 28, 2021, NMFS emailed the COE verifying that we needed a formal consultation request to start the Section 7 process and that we could proceed with a one-year extension if other permitting requirements were not fulfilled in time to install the summer crossing in 2021.

On March 4, 2021, the COE emailed NMFS with a letter requesting formal Section 7 consultation for both summer crossings.

On March 29, 2021, NMFS emailed the County (cc'ing COE) requesting additional information including measures to address stormwater runoff.

On April 13, 2021, the County provided additional information via email as requested from NMFS.

On May 5, 2021, the COE notified NMFS that the issuance of the California State Water Resources Control Board Clean Water Act section 401 water quality certification would not be completed in the time necessary for the COE to issue their Section 404 permit to the County before the target installation date of June 15, 2021.

On May 6, 2021, the COE officially amended their Section 7 consultation request with NMFS to include a one-year extension of their 2009 Section 404 permit to 2021 along with the new 2021 permit request. Therefore, NMFS has extended the duration of the time period considered in this opinion for an additional year. The proposed installation and removal of the summer crossing at Vacation Beach for 2021 will be covered under this biological opinion along with the new 404 permit (Corps SPN-2020-00430) for years 2022 through 2031.

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 the 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 the proposed action would cause any other activities and determined that it would not.

The COE's new 10-year CWA Section 404 permit will authorize the County to continue the annual installation and removal of a temporary summer road crossing at Vacation Beach near the town of Guerneville, California. Proposed activities associated with the summer crossing in 2021 will be covered under this biological opinion, along with a 10-year duration for project activities that will occur from 2022 through 2031. The County has installed and removed summer crossings over the Russian River annually since the 1800's. The project's purpose is to provide vehicular access for emergency services, local residents, tourists, and recreational users during the summer months. Summer tourism increases the population significantly in this region of Sonoma County, with average daily traffic calculated in June 2006 of 930 vehicles per week. The estimate for 2020 was 400 vehicles per day. These calculations are for a 24-hour period and include traffic in both directions. This emergency access has become critical due to the increased fire hazards in recent years. The summer crossing allows quicker access and an evacuation route for residents, first responders, and fire equipment during heightened wildfire conditions. When the summer crossing is closed, the detour route is approximately 4.5 miles longer on narrow, rural roads.

Installation

The crossing will be constructed by extending a crane from the shore to place three, 20-foot long, removable steel bridge deck panels, on four existing concrete piers that span the low-flow channel of the Russian River. A bulldozer will then be used to construct a 230-foot gravel road from the shore to the temporary bridge by pushing or excavating gravel into the river channel. In order to minimize fine sediment entry into the flowing water during construction of the roadway, an imported layer of washed river run rock with minimal fines will be placed within the flowing water at a minimum of two feet above the surface of the water until the gravel for the roadway meets the abutment of the bridge. Additional imported gravel or on-site and stockpiled gravel will be maneuvered with bulldozers on top of the road base until it matches the existing elevations of the bridge abutments and riverbanks. The compacted gravel provides the appropriate road grade and driving surface. Depending on how the river has meandered during the winter, the construction of the summer crossing usually results in narrowing the river channel to the 60-foot distance of the temporary bridge

This project is completed in coordination with the Russian River Recreation and Parks District (RRRPD), whose summer dam is located immediately upstream of the crossing. The RRRPD makes every effort to install the dam before the crossing is constructed. Note that in 2020, due to physical distancing required by Covid-19 precautions, it was uncertain if dam installation would occur. If for any reason the dam cannot be installed before the summer crossing in future years, k-rails or concrete blocks would be used to divert active flow away from the work area. After the dam is installed, the gravel roadway will be constructed across the remainder of the mostly dry river channel to the bridge piers.

The completed roadway crossing is typically 230 feet long and 14 to 16 feet in width, with 2:1 side slopes that are 3 to 10 feet in height above the water surface elevations. Berms are built on both sides of the roadway for vehicular safety, to contain any spills and to prevent vehicle access to the riverbed or runoff from the roadway. Total fill area is approximately 0.02 to 0.13 acre, with discharge of up to 1,960 cubic yards of material. Approximately 600 cubic yards of this fill is below the plane of ordinary high water (OHW), causing temporary disturbance to 0.28 acres of the riverbed.

The minimum amount of gravel and rock used to construct the road may vary due to changes in the river morphology. Annual construction of the crossing typically takes three to four days, and is installed on June 15, and remains installed until October 15. If severe fire danger prompts the Northern California Sonoma Fire District and the County to request an earlier installation or later removal date, the County will request permission in writing from NMFS.

Removal

During removal in the fall, the gravel material will be skimmed and excavated from the temporary roadway and stockpiled outside of the OHW on adjacent County property. Bulldozers and excavators will deconstruct the roadway carefully to minimize the gravel road fill from entering the river channel. Gravel placed within the flowing water will be left in the river channel approximately two feet above the surface of the water. These gravels will gradually disperse downstream of the site during increased winter flows. The deck panels will be removed from the bridge piers and abutments and stored on the approach road above the OHW. Removal generally takes three to four days.

Avoidance and Minimization Measures

1. **Installation and Removal Dates**: The dates for installation and removal are proposed from June 15 to October 15 to minimize potential impacts to migrating salmonids. The County may petition the COE and NMFS annually for an earlier installation date of May 15, or an extension of the removal date in the event that low flow levels permit that, or if the California Department of Forestry official fire season is extended or the fire hazard is severe.

2. **Monitor of River Stage Procedures:** The work period in the channel and adjacent riparian areas will be limited to periods of low flow when the site is not in danger of becoming inundated by high flow events. The river stage forecast will be monitored to ensure that equipment is removed from the site prior to becoming inundated. If the river stage forecast indicates that the crossing may become inundated, the bridge deck and roadway will be removed at least 48 hours before the forecast indicates the crossing will become inundated.

3. **Qualified Biological Monitor:** A qualified biological monitor will be on-site daily to monitor fish presence and behavior of ESA-listed salmonids and steelhead during the installation and removal of the summer crossing. No electrofishing, dewatering, or fish relocation are included as part of the proposed action.

4. **Use of Clean Gravel to Construct the Road Base:** Clean, river-run gravel will be imported to construct the roadway base on the natural gravel bar on the south side of the river where the road comes into contact with flowing water. Imported clean gravel will be piled to an elevation at last 2 feet above the water surface elevation.

5. **Use of on-site Gravel to Construct Roadway:** Only on-site gravel will be used for construction of the roadway (above the road base) leading to the bridge abutment. Gravel will be obtained from the dry gravel bars or stockpiles placed outside of COE jurisdiction. No gravel will be removed from the flowing water. The gravel used for the road base will be left in place at the end of the season. No gravel will be removed from flowing water.

6. **Gravel Skimming Site Buffers:** Where gravel fill material is skimmed from gravel bars, a minimum of 10-foot buffer area will be maintained between the water's edge and the skimming sites.

7. **Limitations on Construction Equipment in Flowing Water:** No construction or construction equipment will occur in the flowing or standing water with the exception of pushing gravel into flowing or standing water to connect the road to the meet the bridge pier. There will be no motorized vehicles in the flowing or standing water of the Russian River.

8. **Gravel Skimming Grading Procedures:** Areas where gravel is skimmed and used for approaches and roadway construction will be graded to slope toward the low flow channel. Immediately after installation and following removal, these areas will be left free of holes and depressions that may trap fish.

9. **Turbidity Monitoring:** Turbidity sampling will be implemented when gravel is disturbed in the wetted channel during construction of the roadway base. Work will be stopped, and the work area will be allowed to "rest" for a minimum of 10 minutes if gravel entering the river causes a plume of turbidity above background levels. Work will resume after the stream reaches original background turbidity levels.

10. **Fish Avoidance Procedures:** Where gravel must be placed into the flowing or standing water, the area will be thoroughly walked and swept with seine or block nets to cause a disturbance and ensure no salmonids are affected adversely. This action will usher away any fish that may be in small areas where the gravel will be pushed next to the bridge pier. A qualified fisheries biologist will perform fish avoidance procedures.

11. **Gravel Pushing Procedures:** Where gravel must be placed into the flowing or standing water to build the approach to the bridge pier, the gravel will be pushed from the upstream end toward the downstream end. This process of pushing or dumping gravel into the flowing or standing water will be at a slow rate, after the biologist excludes fish from the area. This process will be done so that no ponded areas that could entrap fish are created.

12. **Stockpiling:** At the end of the season, compactable road fill stockpiled outside of the OHW and river channel.

13. **Motorized Vehicle Storage Procedures:** No motorized vehicles will be left within the river channel (top of bank to top of bank) overnight.

14. **Vegetation Removal Procedures:** Although vegetation removal or disturbance is not expected, vegetation that cannot be avoided will be pruned, where possible, in lieu of cutting the main stem. If necessary, removal of any tree will require that the tree be cut above grade to facilitate re-growth and only the minimum amount of vegetation will be removed that is necessary to construct the project.

15. **Erosion Control:** Best Management Practices (BMPs) will be implemented to avoid and minimize erosion from stockpiles and other construction activities, including covering stockpiles, hydromulch, and wattles. No wattles with plastic filament shall be used.

16. **Spill Prevention and Cleanup Measures**: Spill prevention will be implanted for potentially hazardous materials. This includes proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting any spills. Spill cleanup kits will be onsite at all times. If any spill takes place, clean-up will occur immediately. If necessary, contaminant berms will be constructed to prevent spilled materials from reaching surface water features.

    a. All refueling and maintenance of equipment shall occur outside the creek channel (top of bank to top of bank) and at least 50 feet away from the river. Receptacles containing fuel, oil, or any other substance that may adversely affect aquatic resources shall be stored outside of the channel.
    b. Where possible, equipment and hazardous materials will be stored at least 50 feet away from surface water features.
    c. Vehicles and equipment used during construction will receive proper and timely maintenance to reduce the potential for mechanical breakdowns leading to a spill of materials.
    d. No equipment will be washed within or near the river channel, or where wash water could flow into the drainage.
    e. Work will not begin unless no precipitation is forecast for the work period.
    f. Debris, silt, bark, rubbish, oil, or other petroleum products, or any other substances resulting from project-related activities which could be hazardous to aquatic life will be prevented from contaminating the soil or entering waters of the United States.
    g. Following project construction, all equipment, materials, liter and other remaining debris will be removed from the work site.

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

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

2.1. Analytical Approach

This 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 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 as a whole for the conservation of a listed species" (50 CFR 402.02).

The designations of critical habitat for species addressed in this opinion use the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not change the scope of our analysis and in this opinion we use the terms "effects" and "consequences" interchangeably.

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

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

- If necessary, suggest a reasonable and prudent alternative to the proposed action.

To conduct the assessment presented in this opinion, NMFS examined an extensive amount of information from a variety of sources. Detailed background information on the biology and status of the listed species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. For information that has been taken directly from published, citable documents, those citations have been reference in the text and listed at the end of this document.

Additional information regarding the potential effects of the proposed activities on the listed species, their anticipated response to these actions, and the environmental consequences of the actions was formulated from the aforementioned resources, and the following:

- Sonoma County. 2020. (BA) – Biological Assessment Russian River Summer Crossing at Vacation Beach. Prepared for: Department of the Army, San Francisco District, U.S. Army COE of Engineers. November 2020. 102 pp.
- NMFS 2009 – Biological Opinion for the Ten Year Permit for the Annual Installation and Removal of Two Summer Road Crossings in the Lower Russian River: Odd Fellows Road Crossing and Vacation Beach Road Crossing in Sonoma County, California. National Marine Fisheries Service, Southwest Region. June 3, 2009.
- NMFS 2012 - Final Recovery Plan for Central California Coast coho salmon Evolutionarily Significant Unit. Southwest Region, Santa Rosa, California. September 2012.
- NMFS 2016a - 5-Year Review: Summary and Evaluation of California Coastal Chinook Salmon and Northern California Steelhead. National Marine Fisheries Service, West Coast Region. April. 61pp.
- NMFS 2016b - Final Coastal Multispecies Recovery Plan: CC Chinook Salmon, Northern California Steelhead, CCC Steelhead. West Coast Region, Santa Rosa CA. October 2016.

The issues NMFS is obliged to address in this opinion are wide-ranging, complex, and often not directly referenced in scientific literature. We base many of our conclusions on explicit assumptions informed by the available evidence. By this, we mean to make a reasonable effort to compile the best scientific and commercial empirical evidence related to the analysis and to then apply general and specific information on salmonid biology from the published literature to make inferences and establish our conclusions. In some cases, we have used the results of recent project specific studies or analyses conducted in the action area. In other situations, only more general local data are available on species presence or absence, and habitat condition. Where necessary, we have used this information and combined it with more general information from the scientific literature to infer salmonid response to the proposed action. In several instances, we make reasonable inferences that rely mainly on information in the scientific literature, because local data are not available.

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' "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 function of the PBFs that are essential for the conservation of the species.

NMFS assesses four population viability[1] parameters to discern the status of the listed Evolutionarily Significant Units (ESUs) and Distinct Population Segments (DPSs) and to assess each species ability to survive and recover. These population viability parameters are: abundance, population growth rate, spatial structure, and diversity (McElhany *et al.* 2000). While there is insufficient data to evaluate these population viability parameters quantitatively, NMFS has used existing information to determine the general condition of the populations in the CCC coho salmon and CC Chinook salmon ESUs and CCC steelhead DPS and the factors responsible for the current status of these listed species.

We use these population viability parameters as surrogates for "reproduction, numbers, and distribution" in the regulatory definition of "jeopardize the continued existence of" (50 CFR 402.02). For example, abundance, population growth rate, and distribution are surrogates for numbers, reproduction, and distribution, respectively. The fourth parameter, diversity, is related to all three regulatory criteria. Numbers, reproduction, and distribution are all affected when genetic or life history variability is lost or constrained, resulting in reduced population resilience to environmental variation at local or landscape-level scales.

This opinion analyzes the effects of the proposed action on the following federally-listed species' ESUs, DPS, and designated critical habitat.

CCC coho salmon ESU
Endangered (70 FR 37160; June 28, 2005)
Critical habitat designation (64 FR 24049; May 5, 1999);
CCC steelhead DPS
Threatened (71 FR 834; January 5, 2006)
Critical habitat designation (70 FR 52488; September 2, 2005);
CC Chinook salmon ESU
Threatened (70 FR 37160; June 28, 2005)
Critical habitat designation (70 FR 52488; September 2, 2005).

[1] NMFS defines a viable salmonid population as "an independent population of any Pacific salmonid (genus *Oncorhynchus*) that has a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100- year time frame" (McElhany *et al*. 2000).

2.2.1. CCC Coho Salmon Life History and Status

Coho Salmon Life History

In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple three year life cycle. Coho salmon are typically associated with medium to small coastal streams characterized by heavily forested watersheds; perennially-flowing reaches of cool, high-quality water; dense riparian canopy; deep pools with abundant overhead cover; instream cover consisting of large, stable woody debris and undercut banks; and gravel or cobble substrates. Adult coho salmon typically begin the freshwater migration from the ocean to their natal streams after heavy late fall or winter rains breach the sandbars at the mouths of coastal streams (Sandercock 1991). Delays in river entry of over a month, are not unusual (Salo and Bayliff 1958, Eames *et al.* 1981). Migration continues into March, generally peaking in December and January, with spawning occurring shortly after arrival to the spawning ground (Shapovalov and Taft 1954).

Preferred spawning grounds for coho salmon include the following: nearby overhead and submerged cover for holding adults; water depth of 4 to 21 inches; water velocities of 8 to 30 inches per second; clean, loosely compacted gravel (0.5 to 5 inch diameter) with less than 20 percent fine silt or sand content; cool water ranging from 39 to 50 degrees Fahrenheit (°F) with high dissolved oxygen of 8 mg/L; and inter-gravel flow sufficient to aerate the eggs. Lack of suitable gravel often limits successful spawning. Coho salmon are semelparous meaning they die after spawning. The eggs hatch after four to eight weeks, depending on water temperature. Survival and development rates depend on temperature and dissolved oxygen levels within the redd. McMahon (1983) found that egg and fry survival drops sharply when fine sediment makes up 15 percent or more of the substrate.

As the fish continue to grow, they move into deeper water and expand their territories until, by July and August, they reside exclusively in deep pool habitat. Juvenile coho salmon prefer: well shaded pools at least 3.3 feet deep with dense overhead cover, abundant submerged cover (undercut banks, logs, roots, and other woody debris); water temperatures of 54° to 59° F (Brett 1952, Reiser and Bjornn 1979), but not exceeding 73° to 77° F (Brungs and Jones 1977) for extended time periods; dissolved oxygen levels of 4 to 9 mg/L; and water velocities of 3.5 to 9.5 inches per second in pools and 12 to 18 inches per second in riffles. Water temperatures for good survival and growth of juvenile coho salmon range from 50° to 59° F (Bell 1973, McMahon 1983). Growth slows considerably at 64° F and ceases at 68° F (Bell 1973).

In the spring, as yearlings, juvenile coho salmon undergo a physiological process, or smoltification, which prepares them for living in the marine environment. They begin to migrate downstream to the ocean during late March and early April, and out-migration usually peaks in mid-May.

CCC Coho Salmon Status

Historically, the CCC coho salmon ESU was comprised of approximately 76 coho salmon populations. Most of these were dependent populations that needed immigration from other nearby populations to ensure their long-term survival. There are now 11 functionally independent populations (meaning they have a high likelihood of surviving for 100 years absent anthropogenic impacts) and 1 potentially independent population of CCC coho salmon (Spence *et al.* 2008, Spence *et al.* 2012). Most of the populations in the CCC coho salmon ESU are currently not viable, hampered by low abundance, range constriction, fragmentation, and loss of genetic diversity.

Brown *et al.* (1994) estimated that annual spawning numbers of coho salmon in California ranged between 200,000 and 500,000 fish in the 1940s. Abundance declined further to 100,000 fish by the 1960s, then to an estimated 31,000 fish in 1991. In the next decade, abundance estimates dropped to approximately 600 to 5,500 adults (NMFS 2005). CCC coho salmon have also experienced acute range restriction and fragmentation. Adams *et al.* (1999) found that in the mid-1990s, coho salmon were present in 51 percent (98 of 191) of the streams where they were historically present, and documented an additional 23 streams within the CCC coho salmon ESU with no historical records. Recent genetic research has documented reduced genetic diversity within subpopulations of the CCC coho salmon ESU (Bjorkstedt *et al.* 2005), likely resulting from inter-breeding between hatchery fish and wild stocks.

Available data from the few remaining independent populations suggests population abundance continues to decline, and many independent populations essential to the species' abundance and geographic distributions have been extirpated. This suggests that populations that historically provided support to dependent populations via immigration have not been able to provide enough immigrants to support dependent populations for several decades. The viability of many of the extant independent CCC coho salmon populations over the next couple of decades is of serious concern. These populations may not have sufficient abundance levels to survive additional natural or human caused environmental change. The overall risk of CCC coho salmon extinction remains high, and the most recent status review reaffirmed the ESU's endangered status (Rogers 2016).

The substantial decline in the Russian River coho salmon abundance led to the formation of the Russian River Coho Salmon Captive Broodstock Program in 2001. Under this program, offspring of wild captive-reared coho salmon are released as juveniles into tributaries within their historic range with the expectation that some of them will return as adults to naturally reproduce. Coho salmon have been released into several tributaries within the lower Russian River watershed as well as in Salmon, Walker, and Redwood creeks.

The five CCC coho diversity strata defined by Bjorkstedt *et al.* (2005) no longer support viable populations. The Russian River and Lagunitas Creek populations are relative strongholds for the species compared to other CCC coho salmon populations. According to Williams *et al.* (2016), CCC coho salmon abundance has improved slightly since 2011 within several independent populations (including Lagunitas Creek), although all populations remain well below their recovery targets. Within the Lost Coast – Navarro Point stratum, current population sizes range from 4 to 12 percent of proposed recovery targets. Recent sampling within Pescadero Creek and San Lorenzo River, the only two independent populations within the Santa Cruz Mountains strata, suggest coho salmon have likely been extirpated within both basins.

In positive developments, excess broodstock adults from the Russian River and Olema Creek were stocked into Salmon Creek and the subsequent capture of juvenile fish indicates successful reproduction occurred. Scott Creek experienced the largest coho salmon run in a decade from 2014 to 2015, and researchers recently detected juvenile coho salmon within four dependent watersheds (San Vincente, Waddell, Soquel and Laguna creeks) where they were previously thought to be extirpated. In the fall of 2020, over 10,000 juvenile coho were released into Pescadero Creek.

2.2.2. CCC Steelhead Life History and Status

Steelhead Life History

Steelhead spend anywhere from one to five years in saltwater, however, two to three years are most common (Busby *et al*. 1996). The older juvenile and adult life stages occur in the ocean, until the adults move up freshwater streams to spawn. Eggs, alevins (gravel dwelling hatchlings), fry juveniles (newly emerged from stream gravels), and young juveniles all rear in freshwater until they become large enough to migrate to the ocean to finish rearing and maturing to adults.

Steelhead fry rear in edgewater habitats and move gradually into pools and riffles, as they grow larger. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Shirvell 1990, Meehan and Bjornn 1991). Because rearing juvenile steelhead reside in freshwater all year, adequate flow and temperature are important to the population at all times. Rearing steelhead juveniles prefer water temperatures of 45° to 58 °F and have an upper lethal limit of 75 °F (Barnhart 1986, Bjornn and Reiser 1991). They can survive in water up to 80.5 °F with saturated dissolved oxygen conditions and a plentiful food supply. Fluctuating diurnal water temperatures also aid in survivability of salmonids (Busby *et al.* 1996). Juvenile steelhead emigrate from natal streams during fall, winter, and spring high flows, to the ocean to continue rearing to maturity. Because rearing juvenile steelhead often migrate downstream in search of available freshwater habitat (Bjornn 1971), significant percentages of the juvenile steelhead population can end up rearing in coastal lagoons and estuaries (Zedonis 1992; Shapovalov and Taft 1954). If estuarine or coastal lagoon rearing habitat is unavailable or of poor quality, the potential survival of these emigrants is low. Suspended sediment concentrations, or turbidity, also can influence the distribution and growth of steelhead (Bell 1973, Sigler *et al.* 1984, Newcombe and Jensen 1996).

The timing of upstream migration is correlated with seasonal high flows and associated lower water temperatures. Steelhead begin returning to the Russian River in December, with the run continuing into April. Although spawning typically occurs between January and May, the specific timing of spawning may vary a month or more among streams within a region, and within streams inter-annually. Spawning (and smolt emigration) may continue through June (Busby *et al.*. 1996). Steelhead do not necessarily die after spawning and may return to the ocean, sometimes repeating their spawning migration one or more years.

CCC Steelhead Status

Historically, approximately 70 populations[2] of steelhead existed in the CCC steelhead DPS (Spence *et al.* 2008, Spence *et al.* 2012). About 37 of these were considered independent, or potentially independent (Bjorkstedt *et al.* 2005). The remaining populations were dependent upon immigration from nearby CCC steelhead DPS populations to ensure their viability (McElhaney *et al.* 2000, Bjorkstedt *et al.* 2005).

While historical and present data on abundance are limited, CCC steelhead numbers are substantially reduced from historical levels. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this DPS in the mid-1960s, including 50,000 fish in the Russian River - the largest population within the DPS (Busby *et al.* 1996). Though still below historic levels, the trend of adult returns to the Warm Springs and Coyote Valley fish facilities on the Russian River has improved since the 1980s and '90s. Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with recent estimates for several streams (Lagunitas, Waddell, Scott, San Vicente, Pudding, Caspar creeks) of individual run sizes of 500 fish or less (62 FR 43937; August 18, 1997). Some loss of genetic diversity has been documented and attributed to previous among-basin transfers of stock and local hatchery production in interior populations in the Russian River (Bjorkstedt *et al.* 2005). In San Francisco Bay streams, reduced population sizes and fragmentation of habitat has likely also led to loss of genetic diversity in these populations.

A 2008 viability assessment of CCC steelhead concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable, and the limited information available did not indicate that any other CCC steelhead populations were demonstrably viable (Spence *et al.* 2008). Although there were average returns (based on the last ten years) of adult CCC steelhead during 2007/08, research monitoring data from the 2008/09 and 2009/10 adult CCC steelhead returns show a decline in returning adults across their range compared to the previous ten years. The lack of adequate spawner surveys within the Russian River precludes the estimation of wild steelhead escapement within the basin; however, hatchery returns suggest the vast majority of returning fish are of hatchery origin. Information from years of the Coastal Monitoring Program in the Santa Cruz Mountains suggests that population sizes there are higher than previously thought. However, the long-term downward trend in the Scott Creek population, which has the most robust estimates of abundance, is a source of concern. Population-level estimates of adult abundance are not available for any of the seven independent populations (i.e., Novato Creek, Corte Madera Creek, Guadalupe River, Saratoga Creek, Stevens Creek, San Francisquito Creek, and San Mateo Creek) inhabiting the watersheds of the coastal strata.

Certain aspects of the steelhead life history have afforded it greater resistance to extinction. For example, juveniles are able to tolerate a wider range of habitat conditions than most salmonids. This has allowed them to survive where others cannot (in very low numbers in portions of constructed flood control channels for example). One apparent adaptive strategy however, appears to have created a challenge to their recovery. The habit of rearing in the estuary affords

[2] Population as defined by Bjorkstedt *et al*. 2005 and McElhaney *et al*. 2000 as, in brief summary, a group of fish of the same species that spawns in a particular locality at a particular season and does not interbreed substantially with fish from any other group. Such fish groups may include more than one stream.

significant growth opportunities to that portion of the population, which spends some or all of its time doing so, rather than in the stream environment (Bond 2006; Hayes *et al.*2006). The propensity for estuarine rearing appears to increase with populations in more southern latitudes and may be an adaptation to reduced instream growth opportunities in more arid regions where summer rearing habitat may be limited.

The scarcity of information on CCC steelhead abundance continues to make it difficult to assess whether conditions have changed appreciably since the previous status review assessment (Williams *et al.* 2016). The most recent status update concludes that steelhead in the CCC DPS remain "likely to become endangered in the foreseeable future", as new and additional information does not appear to suggest a change in extinction risk (Howe 2016). NMFS concluded that the CCC steelhead DPS shall remain listed as threatened (81 FR 33468; May 26, 2016).

2.2.3. CC Chinook Life History and Status

CC Chinook Life History

Chinook salmon follow the typical cycle of Pacific salmon, hatching in freshwater, migrating to the ocean, and returning to freshwater to spawn and die. The low flows, high water temperatures, and sand bars that develop in smaller coastal rivers of coastal California during the summer months favor an ocean-type life history or fall-run (Kostow 1995). With this life history, adults enter freshwater between August and January (Fukushima and Lesh 1998; Chase *et al.* 2007) and smolts typically outmigrate as sub-yearlings between April and July (Myers *et al.* 1998). Fall-run fish typically enter freshwater, move rapidly to their spawning areas on the mainstem or lower tributaries of mainstem rivers (elevations of 200 to 1,000 feet), and spawn within a few weeks of freshwater entry. Juveniles emigrate to estuarine or marine environments shortly after emergence from the redd (Healy 1991). After emigrating, Chinook salmon remain in the ocean for two to five years and tend to stay in the coastal waters off California and Oregon (Healey 1991).

Optimal spawning temperatures range between 5.6 and 13.9°C. Successful incubation depends on several factors, including dissolved oxygen levels, temperature, substrate size, amount of fine sediment, and water velocity. Maximum survival of incubating eggs and pre-emergent fry occurs at water temperatures between 5.6 and 13.3°C with an optimal temperature of 11.1°C (Beauchamp *et al.* 1983). Fry emergence begins in December and continues into mid-April (Leidy and Leidy 1984).

CC Chinook Status

The CC Chinook salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River, in Humboldt County, to the Russian River. Seven artificial propagation programs were considered part of the ESU at the time of listing: the Humboldt Fish Action Council (Freshwater Creek), Yager Creek, Redwood Creek, Hollow Tree, Van Arsdale Fish Station, Mattole Salmon Group, and Mad River Hatchery fall-run Chinook hatchery programs. The CC Chinook salmon ESU was historically comprised of approximately 32 Chinook salmon populations (Bjorkstedt *et al.* 2005). About 14 of these populations were independent, or potentially independent. The remaining populations were likely more dependent upon immigration from nearby independent populations than dependent populations of other salmonids (Bjorkstedt *et al.* 2005).

Data on CC Chinook salmon abundance, both historical and current, is sparse and of varying quality (Bjorkstedt *et al.* 2005). Estimates of absolute abundance are not available for populations in this ESU (Myers *et al.* 1998). In 1965, CDFG (1965) estimated escapement for this ESU at over 76,000. Most were in the Eel River (55,500), with smaller populations in Redwood Creek (5,000), Mad River (5,000), Mattole River (5,000), Russian River (500) and several smaller streams in Humboldt County (Myers *et al.* 1998). The Russian River population of Chinook salmon has shown no discernable trend in population abundance, with an average annual escapement counted at the Mirabel counting facility of 3,257 fish (Williams et al. 2016).

CC Chinook salmon populations remain widely distributed throughout much of the ESU. Notable exceptions include the area between the Navarro River and Russian River and the area between the Mattole and Ten Mile River populations (Lost Coast area). The lack of Chinook salmon populations both north and south of the Russian River (the Russian River is at the southern end of the species' range) makes it one of the most isolated populations in the ESU. Myers *et al.* (1998) reports no viable populations of Chinook salmon south of San Francisco, California.

Because of their prized status in the sport and commercial fishing industries, CC Chinook salmon have been the subject of many artificial production efforts, including out-of-basin and out-of-ESU stock transfers (Bjorkstedt *et al.* 2005). Therefore, it is likely that CC Chinook salmon genetic diversity has been significantly adversely affected despite the relatively wide population distribution within the ESU. An apparent loss of the spring-run Chinook life history in the Eel River Basin and elsewhere in the ESU also indicates risks to the diversity of the ESU.

Williams *et al.* (2016) did not find evidence of a substantial change in conditions since the last status review (Williams *et al.* 2011). Williams *et al.* (2016) summarized conclusions from previous status reviews (Good *et al.* 2005, Williams *et al.* 2011) 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. Williams *et al.* (2016) concluded the extinction risk of the CC Chinook salmon ESU has not changed since the last status review. The latest status review of CC Chinook salmon determined that there is no change in the extinction risk for this ESU, and NMFS affirmed that the CC Chinook salmon ESU should remain listed as threatened (NMFS 2016a). NMFS's recovery plan (NMFS 2016b) for the CC Chinook salmon ESU identified the major threats to recovery as: channel modification, roads, logging and timber harvesting; water diversions and impoundments; and severe weather.

2.2.4. Status of Critical Habitat

PBFs for CCC steelhead and CC Chinook salmon critical habitat within freshwater include:

- freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;

- freshwater rearing sites with:
    - water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
    - water quality and forage supporting juvenile development;
    - natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks;
- freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

For CCC coho salmon critical habitat, the following essential habitat types were identified: 1) juvenile summer and winter rearing areas; 2) juvenile migration corridors; 3) areas for growth and development to adulthood; 4) adult migration corridors; and 5) spawning areas. Within these areas, essential features of coho salmon critical habitat include adequate: 1) substrate, 2) water quality, 3) water quantity, 4) water temperature, 5) water velocity, 6) cover/shelter, 7) food, 8) riparian vegetation, 9) space, and 10) safe passage conditions (64 FR 24029, 24059; May 5, 1999).

The condition of CCC coho salmon, CCC steelhead and CC Chinook salmon 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[3]: logging, agriculture, mining, urbanization, stream channelization and bank stabilization, 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; Busby *et al.* 1996; 64 FR 24049; 70 FR 52488). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within coho and Chinook salmon ESUs and steelhead DPSs. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

2.2.4.1. Additional Threats to Listed Species and Critical Habitat

Another factor affecting the rangewide status of coho and Chinook salmon and steelhead, and their critical habitat at large, is climate change. Impacts from global climate change are already

[3] Other factors, such as over fishing and artificial propagation have also contributed to the current population status of these species. All these human induced factors have exacerbated the adverse effects of natural environmental variability from such factors as drought and poor ocean productivity.

occurring in California and listed salmonids here may have already experienced some detrimental impacts. For example, average annual air temperatures, heat extremes, and sea level have all increased in California over the last century (Kadir *et al.* 2013). California has a history of episodic droughts. However, the five-year period from 2012 to 2016 was the driest since record keeping began (Williams *et al.* 2016). Current water levels in Lake Sonoma and Mendocino (at the time of this opinion issuance) are the lowest they have ever been in the month of April. Also in California, August through October of 2020 were the hottest of those months ever recorded (NOAA).

The threat to salmonids from global climate change will continue 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 be comprised of higher temperatures (Hayhoe *et al.* 2004, Moser *et al.* 2012; Kadir *et al.* 2013). Total precipitation in California will likely decline and critically dry years may increase (Lindley *et al.* 2007; Schneider 2007; Moser *et al.* 2012).

For Northern California, most models project heavier and warmer precipitation. Extreme wet and dry periods are projected, increasing the risk of both flooding and droughts (DWR 2013). Many of these changes are likely to further degrade salmonid habitat by reducing stream flow during the summer and raising summer water temperatures. For example, in the San Francisco Bay region, warm temperatures generally occur in July and August, but as climate change takes hold, the occurrences of these events will likely begin in June and could continue to occur in September (Cayan *et al.* 2012). Climate simulation models project that the San Francisco region will maintain its Mediterranean climate regime, but will also experience a higher degree of variability of annual precipitation during the next 50 years.

Although wildfires are an integral ecological feature in California, they are expected to increase in frequency and magnitude (Westerling *et al.* 2011, Moser *et al.* 2012, Goss *et al.* 2020). In 2020, the Walbridge fire alone burned over 55,000 acres and included approximately half of the CCC coho salmon spawning habitat available in the lower Russian River tributaries. In the same year, the CZU Lightning Complex fire burned 86,500 acres in San Mateo and Santa Cruz Counties. Of the nine historic CCC coho salmon populations in the Santa Cruz Mountains identified in the recovery plan, six experienced burning, of which three experienced severe burning. These three populations (Gazos Creek, Waddell Creek, and Scott Creek) represented some of the highest quality habitat for CCC coho salmon south of San Francisco (J. Casagrande, personal communication 2020). Wildfires can increase wet-season runoff, reduce summertime surface flows, and increase stream temperatures (Boughton et al. 2007). When wildfires are followed by heavy rains in areas which are geomorphically unstable, high flows may cause an increase in sediment delivery to streams via debris torrents (Spina and Tormey 2000, Keeley 2006), that cover habitats and fish alike.

Estuaries may also experience changes detrimental to salmonids. 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 *et al.* 2004; Osgood 2008; Turley 2008; Abdul-Aziz *et al.* 2011; Doney *et al.* 2012).

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 this project is the area that will be directly and indirectly impacted by the proposed installation and removal of the summer road crossing located at Vacation Beach. This includes the bank to bank width of the Russian River at the Vacation Beach Summer Crossing Site, upstream approximately 500 feet and approximately one and a half miles downstream. The action area is based on observations made by a NMFS biologist during the installation of the crossing in May 2002 where turbidity extended one and a half miles downstream (NMFS 2009). The action area is extended upstream approximately 500 feet due to the potential disturbances caused by the heavy equipment and the disturbances to the wetted channel, which may cause fish to move upstream.

The action area has a Mediterranean climate characterized by cool wet winters with typically high runoff, and dry warm summers characterized by greatly reduced instream flows. Fog is a dominant climatic feature along the coast, generally occurring daily in the summer and not infrequently throughout the year. Higher elevations and inland areas tend to be relatively fog free. Most precipitation falls during the winter and early spring as rain, with occasional snow above 1,600 ft. along the coast, average air temperatures range from 46° to 56° Fahrenheit (F). Further inland and in the southern part of the action area, annual air temperatures are much more varied, ranging from below freezing in winter to over 100°F during the summer months.

High seasonal rainfall on bedrock and other geologic units with relatively low permeability, erodible soils, and steep slopes contribute to the flashy nature (stream flows rise and fall quickly) of the watersheds within the action area. In addition, these high natural runoff rates have been increased by road systems, urbanization, and other land uses. High seasonal rainfall combined with rapid runoff rates on unstable soils delivers large amounts of sediment to river systems. As a result, many river systems within the action area contain a relatively large sediment load, typically deposited throughout the lower gradient reaches of these systems.

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).

The action area is within the lower portion of the Russian River watershed near Guerneville and is confined in a narrow canyon/valley with limited floodplain area and steep forested hillsides. This reach of the Russian River is stable with little meander or movement from one year to the next and a gravel bar consistently forms on the south side of the river that extends approximately half the channel width. The land use around the project sites is primarily rural residential and with some agriculture, mainly vineyards. The upland areas are predominately forested with rural residences.

2.4.1. Status of CCC Coho Salmon, CCC Steelhead, and CC Chinook Salmon in the Action Area

CCC Coho Salmon

Information on the historic run size of coho salmon in the Russian River is limited. Late 19th and early 20th Century records are sparse, or non-specific as to species (Chase *et al.* 2007). They once occupied many tributaries throughout the basin, probably reared in backwater areas of the main stem, and were a major component of the fish community (Spence *et. al*. 2005). Bjorkstedt (2005) concluded that coho salmon existed as two populations in the Russian River: a large independent population in the lower basin, and a smaller ephemeral population that occupied tributaries in the northwest corner of the basin. The lower river population represented what was historically the largest and most dominant source population in the ESU. They are now restricted to a few tributaries in the lower watershed (CDFG 2002), and rear only in isolated areas of suitable habitat.

The Russian River Coho Salmon Captive Broodstock Program (RRCSCBP) was initiated in 2001 to reestablish self-sustaining runs of coho salmon in tributary streams within the Russian River Basin (Obedzinski et al. 2007). Under this program, offspring of wild captive-reared coho salmon are released as juveniles into tributaries within their historic range with the expectation that a portion of them will return to these areas as adults to naturally reproduce. Recent data collected during 2019 monitoring surveys indicates that natural-origin juvenile coho salmon were present in small numbers in 23 tributaries of the lower Russian River (SCWA 2020).

Genetic analyses of coho salmon sampled from Russian River tributaries are consistent with what would be expected for a population with such extremely reduced abundance. A review by Bjorkstedt (2005) found both strong departures from genetic equilibrium and evidence of recent, severe population bottlenecks. Historical hatchery practices may also have contributed to these results. This evidence suggests an acute loss of genetic diversity for the Russian River coho salmon population.

Based on the decline in abundance, restricted and fragmented distribution, and lack of genetic diversity, the Russian River population of coho salmon is in immediate danger of extinction. The Russian River population itself is in the middle of the CCC coho salmon ESU's range and inhabits a watershed that represents fully a third of the ESU by area. For these reasons, irrespective of the condition of the watershed, the Russian River has great potential to provide important geographic continuity, diversity, and habitat space for the species. The continued existence of CCC coho salmon in the Russian River is therefore significant to the survival and recovery of the entire CCC coho salmon population.

CCC Steelhead

Russian River steelhead runs once ranked as the third largest in California behind the Klamath and Sacramento rivers. The Russian River was renowned as one of the world's finest steelhead rivers during the l930's and on through the 1950's (SEC 1996). SEC (1996) reported historic Russian River catch estimates for steelhead: 15,000 for the 1936 sport catch, and 25,000 for the 1956/57 sport catch. These estimates are based on best professional judgment by a CDFG employee and, for the latter estimate, a sportswriter. Other estimates include one of 57,000 steelhead made in 1957 (SEC 1996). Since the mid-20th Century, Russian River steelhead populations have declined. Estimates based on best professional judgment infer a wild run of 1,750 to 7,000 fish near the end of the 20th Century (Busby 1996). Hatchery returns averaged 6,760 fish for the period 1992/93 to 2006/07, and ranged from 2,200 to 11,828 fish. The information available suggests that recent basin-wide abundance of wild steelhead has declined considerably from historic levels. A limited catch-and-release hatchery sport fishery still offers a fishing season for hatchery steelhead in the Russian River.

Reproduction of the Russian River steelhead population is primarily dependent on tributary spawning outside the action area. Steelhead also rear in the mainstem, but in very low numbers. Degraded rearing habitat and low densities indicate the mainstem within the action area is not currently capable of supporting large numbers of rearing juvenile steelhead. The mainstem throughout the action area and beyond, although degraded for rearing, is used by out-migrating smolts on their way to the Pacific Ocean.

Hatchery practices have also impacted steelhead populations within the action area. Since the 1870's, millions of hatchery-reared salmonids have been released into the Russian River Basin. The combination of planting out-of-basin stocks, hatchery selecting processes, and interbreeding have led to a decrease in salmonid genetic diversity and loss of local adaptations (SEC 1996). There are two fish production facilities in operation within the Russian River Basin: Don Clausen Fish Hatchery (also referred to as the Warm Springs Hatchery) and Coyote Valley Fish Facility. Both facilities are owned by the COE and operated under contract by CDFW. The Coyote Valley Fish Facility, located upstream of the action area primarily produces and releases steelhead which have the potential to effect naturally-produced steelhead within the action area.

Despite declines in abundance, steelhead remain widely distributed within the basin (NMFS 2005). The primary exceptions to this are the barriers to anadromy caused by the Coyote Valley Dam and Warm Springs Dam. The Coyote Valley Dam has blocked approximately 21 percent of the historical habitat of the Upper Russian River population, and the Warm Springs Dam has blocked approximately, 56 percent of the Dry Creek population's historical habitat (Spence 2006).

While the steelhead population has declined dramatically in the Russian River over the past several decades, its current numbers, distribution, and diverse use of habitat will likely provide much stronger resistance to environmental and anthropogenic disturbance when compared to coho salmon and Chinook salmon. However, no information exists that demonstrates that the decline in the Russian River steelhead population has stabilized.

CC Chinook Salmon

Steiner Environmental Consulting (SEC) (l996) reported that there were no Chinook salmon population estimates until the 1960's, and by that time the returns appeared strongly associated with periods of sustained hatchery supplementation. Estimated Chinook salmon escapement was 1,000 in 1966 (CDFG 1966) and 500 in 1982 (COE 1982). SEC (1996) reported that despite heavy planting in Dry Creek during the 1980's, a viable Chinook salmon run was not established. Returns to Warm Springs Dam from 1980 to 1996 ranged between zero and 304, with the biggest count in 1988. Hatchery supplementation was finally terminated in 1996.

Since 2000, the Sonoma County Water Agency (SCWA) has conducted annual counts of CC Chinook salmon moving past the Mirabel Dam water diversion facility located approximately 10 miles upstream from the proposed project. Between 2000 and 2013, the average number of adult Chinook salmon counted at Mirabel Dam was 3,283 fish, and in 2012, 6,697 adult Chinook salmon were counted at the station which was the highest total counted to date (NMFS 2016a). No data was obtained for 2014 and 2015. Between 2016 and 2019, the average number of adult Chinook salmon counted was 1320. In 2019, 909 adult Chinook salmon were counted, the lowest total since counting began (SCWA, 2020). These data suggest a decrease in adult escapement in the past 20 years.

Genetic diversity is an important measure of viability as well. Genetic analysis of Russian River Chinook salmon suggests they are not closely related to either the nearby Eel River or Central Valley Chinook salmon, and likely evolved as part of a diverse group of native coastal populations (Hedgecock 2002). A history of hatchery stocking, however, has likely had some effect on genetic diversity (Bjorkstedt *et al.* 2006, Chase *et al.* 2007).

The Russian River is the largest watershed in the CC Chinook Central Coastal Diversity Stratum and likely has the largest population. This population is also at the southern extent of the species range. Its extinction would therefore constitute a substantial range restriction, the loss of the largest population in the stratum, and probably the loss of a unique genetic component of the ESU. For these reasons, the survival and recovery of the Russian River population of CC Chinook is important to the conservation of the ESU as a whole.

2.4.2. Status of Critical Habitat in the Action Area

The functioning of salmonid critical habitat within the lower mainstem Russian River has been compromised by changes in flow, temperature and fine sediment loading resulting from upstream dams and diversions. In 1922, the completion of Scott Dam forming Lake Pillsbury on the upper Eel River allowed the storage and diversion of water from that basin to the Russian River Basin. Subsequently, the construction of the Coyote Valley Dam in 1958 in the upper Russian River Basin and the construction of the Warn Springs Dam on Dry Creek in 1982 further altered the flows and sediment routing in the Russian River. Environmental Consulting (SEC) (1996) cite unpublished data from the California State Water Resources Control Board

(CSWRCB), which state that there are over 500 small dams on the Russian River and its tributaries.

The action area is also influenced by the annual installation of two summer dams on the mainstem Russian River. The upstream dam is Johnson's Beach summer dam in Guerneville which impounds water to approximately one mile downstream of the Odd Fellows crossing. The second dam is Vacation Beach summer dam, which is located just upstream of the Vacation Beach summer crossing and impounds water upstream to the Johnson's Beach summer dam. Increased summer flows and the installation of these two summer dams, along with fine sediment loading through the winter and spring period have decreased the value of salmonid rearing habitat within the action area and have also created habitat conditions more favorable to introduced and native warm-water fish species such as Sacramento pikeminnow (*Ptychocheilus grandis*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieui*), striped bass (*Marone saxatilis*), and green sunfish (*Lepomis cyanellus*).

These dams have a variety of functions including residential, commercial, and agricultural water supply, flood and/or debris control, and recreation. These small dams interfere with fish migration, affect sediment transport, and affect water flow and temperature. Forestry and agriculture are other significant land uses within the basin, and there are some in-channel gravel mining operations. Brown and Moyle (1991) reported that logging and mining in combination with naturally erosive geology have led to significant aggradation of up to 10 feet in some areas of Austin Creek, a lower Russian River tributary.

The riverbed material of the Russian River consists mostly of alluvial deposits of igneous and sedimentary origin. The upper reaches of the river have a dominant substrate of gravel with cobbles. However, by the time the river nears the Guerneville area, additional fine sediment has entered the river system and the dominant substrate is gravel mixed with a large sediment load. The substrate in the action area lacks clean, loosely compacted, gravel in cool water with highly dissolved oxygen and an inter-gravel flow necessary for spawning. Lack of clean gravel and high water temperatures are two of the factors that make the areas in the lower river unsuitable for spawning habitat. However, the lower river is used by all the salmonid species as a migration corridor to the upper reaches of the mainstem and to the tributaries of the upper and lower river.

The Russian River was included on the 2013 CWA section 303(d) list of water quality limited segments. The pollution factors for the Russian River vary by sub-watershed, but commonly include sediment, temperature, dissolved oxygen, various nutrients, and many chemical pollutants and pathogens. Forestry, agriculture, dams with flow regulation, urban and land development, and nonpoint sources are listed as the potential sources for these factors. Lake Sonoma, a reservoir impounded by Warm Springs Dam, is included on the section 303(d) list because of elevated levels of mercury associated with historic mining. Total maximum daily load (TMDL) is a regulatory term in the CWA, describing a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards (www.epa.gov). Currently, there is no approved TMDL for the Russian River watershed.

Since 2015, NOAA has been working with partners to evaluate the viability of Forecast-Informed Reservoir Operations (FIRO) in achieving improved flood management, water supply, and environmental flows associated with the operations of Lake Mendocino, the reservoir created by the Coyote Valley Dam. The FIRO program, authorized by the COE, allows reservoir operators to use forecasts to inform the storage and release of water in the portion of the flood control pool. If effective, FIRO will provide several benefits for listed salmonids, including: increased cold-water pool availability, more reliable and higher minimum in-stream flows, and better water quality conditions.

We rely on information from section 2.2.5 with respect to the broader climatic variables influencing the current condition of habitat in the action area. Variables such as air temperature, wind patterns, and precipitation are likely influencing localized environmental conditions, such as water temperature, stream flow, and food availability. These local environmental conditions can affect the biology of listed species and the functioning of critical habitat and its value for conservation. The combination of climate change effects and effects of past and current human activities on local environmental conditions further reduce the current condition of available habitat for listed species in the lower Russian River.

Rearing habitat in the mainstem of the Russian River is marginal; primarily due to elevated stream temperatures, fine sediment loading, and the abundance of warm-water predator fish species. Overwinter and outmigration habitat conditions are also poor because the mainstem channel lacks habitat complexity and velocity refuge and carries a high level of fine sediment (Ritter and Brown 1971, COE 1982, Beach 1996, CDFG 2001). Therefore, salmonid habitat conditions within the action area are poor and are not anticipated to improve in the immediate future.

2.4.3. Previous Section 7 Consultations

The following opinions concluded that the projects, as proposed, were not likely to jeopardize the continued existence of, or adversely modify designated critical habitat for threatened CCC steelhead or CC Chinook salmon. Small amounts of incidental take were anticipated, mostly due to the use of block nets and placement of gravel into flowing water, activities necessary to complete the project(s).

On June 11, 2003, NMFS provided an opinion to the COE for the Vacation Beach Summer Crossing (File Number 151422SWR2002SR6434). An amended opinion was issued on May 30, 2006 (File Number 151422SWR2006SR00314). On June 4, 2008, NMFS provided an opinion to the COE for a one-year time extension (File Number 151422SWR2008SR00131).

On June 3, 2009, NMFS issued a new opinion for the *Ten Year Permit for the Annual Installation and Removal of Two Summer road Crossings in the Lower Russian River: Odd Fellows Road Crossing and Vacation Beach Road Crossing in Sonoma County, California*. (File Number 2009/09020). A request from the County to extend their COE permit was granted on January 21, 2020, and the permit was extended until December 31, 2020.

This current consultation covers permit activities from 2021 to 2031.

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. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

The 10-year duration of this opinion will span project activities that occur from 2021 through 2031. NMFS considers the similarities of actions covered under the 2009 opinion and those proposed for the upcoming 2021 construction season and the subsequent 10-year period to be nearly identical in scope and scale. Effects of the proposed actions in both opinions were analyzed for the same species and geographic reach and found to result in low levels of incidental take for federally listed species. Therefore, NMFS finds any potential impacts that may occur due to extending project actions for one year to be negligible.

Installation

The annual installation date of June 15 for the summer crossing will minimize effects to out-migrating Chinook salmon smolts, coho salmon smolts, and steelhead smolts since the majority of outmigration for these species occurs prior to June 15. However, salmonid outmigration monitoring conducted by the SCWA at the Mirabel dam has confirmed that small numbers of salmonid smolts outmigrate through June in some years.

During outmigration, most downstream movements of salmonid smolts occur at night (Moyle 2002) and are not continuous, but are interspersed with periods of holding and feeding (Moser et al. 1991). During holding, salmonids occupy areas in the stream with cover (Raleigh et al. 1984), including shallow water along stream banks (Moyle 2002). Although the installation date will avoid the majority of out-migrating salmonids, low numbers of Chinook salmon, coho salmon, and steelhead smolts may be migrating though the action area during the day. Due to the lower temperature preferences and requirements of coho salmon (Brett 1952, Bell 1973, Reiser and Bjornn 1979, McMahon 1983) as compared to juveniles and smolts of Chinook salmon and steelhead, and because temperatures in the Russian River progressively rise above coho preferred temperatures starting in early May (SCWA 2005), NMFS expects migration of coho juveniles and smolts will mostly becompleted prior to the crossing installation. However, it is still possible for juvenile coho to be in the action area during installation. Low numbers of juvenile steelhead are also expected to be rearing in the action area. Therefore, it is possible that low numbers of Chinook salmon, coho salmon, and steelhead smolts, and rearing juvenile coho and steelhead, may be affected by the following during the installation of the crossing:

- Crushing or displacement during placement of gravel within the wetted channel;
- Reduced fitness or behavioral changes during turbidity plumes;

- Stranding due to flow alteration;
- Loss of food source.

Installation of the summer road crossing at Vacation Beach will use heavy equipment to push gravel into the flowing water of the Russian River from the bank across the channel to the existing bridge abutment. The outer edge section of the low flow channel at this crossing is covered with gravel in order to construct the roadway. The area of the low flow channel that is covered by gravel at this site varies annually due to changes in river morphology and flows. At the Vacation Beach crossing, up to just over half of the width of a shallow section of the low flow channel may be filled in.

Cover is an important habitat component for juvenile salmonids and smolts, both as velocity refuge and as a means of avoiding predation (Shirvell 1990, Meehan and Bjornn 1991, Moyle 2002). Salmonid juveniles will balance their use of cover and foraging habitats based on their competing needs for energy acquisition and safety (Bradford and Higgins 2001). Critical forms of cover include submerged vegetation, woody debris, and the interstitial spaces of stream bed gravel substrate (Raleigh et al. 1984). Juveniles will respond to threats of predation, including overhead motions, by huddling together and/or fleeing to nearby cover (Bugert and Bjornn 1991). Few young-of-the-year are found more than one meter from cover (Raleigh et al. 1984). Juvenile steelhead, particularly the younger, smaller individuals, have a notable response to disturbance; they rely on nearby substrate particles (i.e., gravel) for cover more so than other salmonids (Chapman and Bjornn 1969, Everest and Chapman 1972).

The placement of gravel into the flowing water of the Russian River with heavy equipment has the potential to harm or kill individual salmonids and steelhead that occupy the area and seek refuge in the substrate interstices in response to the disturbance. Smaller juvenile salmonids and steelhead may be injured or killed as the gravel is placed in the channel. Larger juvenile Chinook salmon, coho salmon, and steelhead, including smolts, are less prone to crushing as they will likely flee the area, but may be forced out of their rearing or holding areas to either downstream or upstream of the crossing to lower quality instream habitat and may suffer an increased risk of predation. Due to the timing for installation, NMFS expects very low densities of Chinook salmon, coho salmon, and steelhead smolts, and rearing juvenile salmonids and steelhead to be present within the action area during installation in most years and therefore only minimal mortality is anticipated to result from placing gravel into the flowing water.

Turbidity is the degree to which water loses its transparency due to the presence of suspended sediment. Turbidity may have beneficial or detrimental effects on fish, depending on the intensity, duration and frequency of exposure (Newcombe and MacDonald 1991). A level of turbidity greater than five nephelometric turbidity units (NTU) is considered visible turbidity and turbidity levels above 25 NTU have been shown to cause reductions in salmonid growth (Sigler et al. 1984). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Deposition of fine sediments can reduce incubation success (Bell 1991), interfere with primary and secondary productivity (Spence *et al.* 1996), and degrade cover for juvenile salmonids (Bjornn and Reiser 1991). Chronic, moderate turbidity can harm newly-emerged salmonid fry, juveniles, and even adults by causing physiological stress that reduces feeding and growth and increases basal metabolic requirements (Bjornn and Reiser 1991, Servizi and Martens 1991, Spence *et al.* 1996). Older salmonids typically move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Servizi and Martens 1991).

To decrease the impacts of turbidity during the installation phase, the proposed project will use only imported, clean, river-run gravel for the base of the crossing. Levels of increased turbidity will fluctuate as each load of gravel is pushed into the flowing water. Even though an increase in turbidity is anticipated during installation, based on observations and data collected during previous years, increased turbidity will occur during the installation and fall back within a normal range after two to six hours after the last gravel is pushed into the flowing water. It usually takes three to four days to complete the gravel installation at Vacation Beach. Water samples were taken by a County biologist 100 feet downstream of the crossing prior to, during, and after the input of material into the flowing water at on July 10, 2019. NTU levels rose from 3.25 to 3.9 immediately upon placing gravel into the channel. However, the levels dropped below initial baseline to 2.95 NTU 30 minutes later.

Based on the effects described above, it is anticipated that Chinook salmon, coho salmon, and steelhead smolts, and rearing juvenile salmonids and steelhead downstream of the Vacation Beach crossing may be affected by short-term increases in turbidity caused during the placement of gravel into the flowing water. These pulses of turbidity may cause fish to move downstream or upstream of the crossing to avoid the turbidity. Pulses of increased turbidity are not anticipated to reach lethal levels. However, pulses of increased turbidity may result in salmonids and steelhead temporarily vacating preferred habitat areas and temporarily reducing their feeding efficiency. The behavioral modifications affecting small numbers of juvenile fish will likely result in less fitness of individual fish due to occupation of less suitable habitat, reduced feeding, and potentially greater intra and interspecific competition which, along with increased predation risks, will result in a very minor reduction in survival rates. Due to the timing of the installation, low numbers of Chinook salmon, coho, and steelhead smolts, and rearing juvenile salmonids and steelhead are anticipated to be affected.

Based on observations made during previous Vacation Beach crossing installations, changes in flow and dewatering of the river channel are expected to occur as gravel is pushed into the wetted channel during installation. At this crossing, an increase in flow will occur as the flow is concentrated to the channel between the bridge piers. Concentrating the flow to the channel between the bridge piers by placing gravel within the channel may also result in the dewatering of part of the channel directly downstream of the crossing.

Reductions in downstream flow have the potential to strand fish along stream banks, or they may cause fish to become isolated in small pools or other marginal habitats. The adverse effects of rapid, artificial fluctuations in stream flows on fisheries resources are well documented (Cushman 1985). Risk of stranding is generally highest where the channel slope in areas subjected to dewatering is gentle or irregular. Fish stranded in dewatered areas are vulnerable to both desiccation and increased predation from birds or mammals and they may be subjected to higher rates of mortality due to the effects of deteriorating water quality (e.g., elevated temperatures). Dewatering at the Vacation Beach crossing has the potential to strand and ultimately kill individual Chinook salmon smolts, steelhead smolts, and rearing juvenile steelhead that are within the area that is dewatered. Due to the low numbers of Chinook salmon, coho salmon, and steelhead expected to be present during installation, NMFS anticipates that effects to these species will primarily be non-lethal with a possible minimal amount of mortality.

Direct loss of aquatic macro invertebrates will likely result when organisms are buried or crushed during placement of gravel in the wetted channel. Localized losses in benthic macro invertebrate abundance are expected when substrates are modified (Thomas 1985; Harvey 1986). These organisms are consumed by salmonids, and may represent a substantial portion of their diet at various times of the year. The effect of macro invertebrate loss on salmonids is likely to be temporary because rapid recolonization of the disturbed areas is expected. Reported rates of recolonization range from about one month (Thomas 1985) to 45 days (Harvey 1986). Drift from upstream is likely to provide food supply downstream, as well as insect drop from riparian plants in the action area and upstream unaffected by the project. Since impacts to the substrate will be localized to the area of channel that is covered by gravel, no adverse effects to salmonids are anticipated.

Removal

Monitoring by SCWA at the seasonal Mirabel Dam upstream of the action area indicates that adult Chinook salmon migration begins in mid-August and increases in October with a peak of migration usually occurring in November (S. Chase, personal communication 2002). On October 2, 2002 over 1,000 adult Chinook salmon were counted by SCWA at the Mirabel Dam. This day represents the largest daily count during eight years of monitoring conducted by SCWA with the exception of over 2,000 Chinook salmon counted on November 7, 2002. The increase on October 2 was most likely caused by the October 1 removal of the Vacation Beach summer dam within the action area and the removal of the Johnson's Beach summer dam. Removal of these dams will occur by October 1 each year, so it is not anticipated that Chinook salmon will be congregated within the action area. However, in some years large numbers of adult Chinook salmon may be within the action area during the removal of each crossing.

The removal date of October 15 for the crossing has the potential to affect adult Chinook salmon that are within the action area. Removal of the crossing is not expected to affect adult coho salmon or steelhead because upstream migration occurs later in the fall and winter for these species. Juvenile rearing coho salmon and steelhead may also be within the action area during the removal of each crossing. Therefore, it is possible that low numbers of adult Chinook salmon and rearing juvenile coho salmon and steelhead may be affected by the following during removal of the crossing:

- Exposure to contaminants,
- Reduced fitness or behavioral changes during turbidity plumes.

Removal of each of the crossings will not require any instream work. The compactable road fill material will be skimmed and excavated off the top of the gravel roadway. This material will be stockpiled on the adjacent County right of way. Gravel that is within the wetted channel at Vacation Beach will be partially removed to an elevation of two feet above the water surface to minimize turbidity. High winter flows will disperse the remaining gravel downstream. During the removal of the compactable fill and gravel, minimal amounts of fill and gravel may unintentionally fall into the water. The amount of fill and gravel that does fall into the water during removal is anticipated to cause a localized temporary increase in turbidity near the crossing, and it is not anticipated to crush any fish. However, the behavior of rearing salmonids and steelhead and adult Chinook salmon may be temporarily modified by the increase turbidity and by the noise and vibrations of the heavy equipment used during gravel removal.

This may cause fish to move downstream or upstream of the crossing to avoid the turbidity and noise. Since removal will only affect the immediate area at each crossing, the effects to adult Chinook salmon and rearing juveniles are anticipated to be minor and short-term and are unlikely to result in permanent reduction in the fitness of individual fish.

Each gravel roadway outside of flowing water but within the channel will be graded out with a large bulldozer to approximate the pre-construction contour. These areas will be graded to slope toward the low flow channel and will be left free of holes and depressions that may trap fish with fluctuations in flow. Any increase in turbidity from these disturbed areas would be difficult to distinguish from the background turbidity of floodwaters during storm events.

Fish passage will not be affected during the proposed action since the crossing includes a bridge that spans the low flow channel. The low flow channel below the bridge will provide passage for juvenile salmonids and adult Chinook salmon.

Heavy construction equipment will be utilized during both the installation and removal of the summer crossing. Oils and similar substances from construction equipment can contain a wide variety of hydrocarbons, some of which evaporate rapidly while others sorb to sediments and may persist for long periods of time. These polynuclear aromatic hydrocarbons (PAHs) can prove harmful to benthic communities (EPA 1993) which are a salmonid food source. In a study conducted by Pitt et al. 1995 (reviewed in EPA 1999), 50 percent of samples from parking areas were found to be highly or moderately toxic, 67 percent of samples from streets were found to be moderately toxic and 34 percent of samples from landscaped areas were found to be highly or moderately toxic. Some of the identified chronic toxicity effects to benthic invertebrates in the study are decreased growth and respiration rates.

Construction equipment utilized for the proposed action has the potential to leak toxic chemicals, including metals and petroleum hydrocarbons, in to the riverbed and banks. Fluid leaking from construction equipment or cars can also contain metals, which do not degrade in the environment (e.g., mercury, cadmium, lead, chromium) and bioaccumulate in aquatic organisms. Some of the sub-lethal effects that metals can cause in salmonids include: immobilization and impaired locomotion, reduced growth, reduced reproduction, elevated oxygen consumption, genetic damage, impaired metabolism, alteration of gill tissue structure, tumors and lesions, developmental abnormalities, behavior changes (avoidance), immunosuppression (decreased resistance to bacterial infection), and impairment of olfactory and brain functions (Eisler 2000).

During installation and removal, equipment refueling, fluid leakage and maintenance activities risk, it is proposed that no motorized equipment will be left within the river channel (top of bank to top of bank) overnight unless absorbent material is placed under the equipment to contain any leaking fluids. However, this does not completely minimize all the risks. Fluid leakage can occur during operation, refueling and during maintenance activities. There is a potential for leakage of toxic chemicals to occur during installation and removal of the crossing that may have the potential to affect adult Chinook salmon and rearing juvenile coho salmon and steelhead. Most of the work would occur outside of the wetted channel, which reduces the chance that toxic chemicals would be released in the flowing water. If there is a leak, NMFS anticipates that it can be contained prior to entering the flowing water, thus making it unlikely that salmonids will be adversely affected. Additionally, roadway materials which may have come into contact with contaminants through the summer season (leakage from automobiles, for example) will be removed from the channel when the upper portion of the roadway is removed before winter rains occur, preventing their contact with the flowing waters of the Russian River.

The CSWRCB has issued a storm water permit for Caltrans, which includes background information from a recent publication that identifies a degradation product of tires (6PPD-quinone) as the causal factor in salmonid mortalities at concentrations of less than a part per billion (Tian et al., 2020). It should be noted that the few studies that have identified this link were conducted in highly urbanized areas with extensive impervious surfaces (such as Puget Sound and Los Angeles). This contaminant is widely used by multiple tire manufacturers and the tire shreds that produce it have been found to be ubiquitous where both rural and urban roadways drain into waterways (Sutton et al., 2019). Previous published work first focused on identifying the issue and determining the cause of observed mortalities of adult coho salmon in the wild (Scholz et al., 2011) and then showed mortality to juvenile coho salmon in laboratory settings (Chow et al., 2019). More recent examinations of juvenile steelhead and Chinook salmon by NMFS Northwest Fisheries Science Center and partners also indicates mortality of up to 40 percent for steelhead and up to 10 percent for Chinook salmon (Tian et al., 2020).

These contaminants accumulate on hard surfaces, then wash into watersheds via stormwater runoff during rain events. In one study, 6PPD-quinone was not detected in samples collected during pre and post storm conditions (Tian 2021). The presence of adult Chinook salmon and juvenile salmonids and steelhead will likely coincide with the rainy season that may bring them into contact with contaminants from the bridge and gravel roadway. Therefore, run-off from the bridge deck, the road approaches, and the built-up gravel roadway are likely to deliver tire shreds to the river channel and result in adverse effects to salmonids within the action area. However, mortality is expected to be low due to the rural setting of the proposed project and will be minimized with proper stormwater runoff drainage at the site. Water from the bridge, approach roads and gravel road will mostly be diverted into vegetated areas and roadside ditches prior to entering the Russian River. The County may also incorporate additional straw wattles on the approach roads and within the roadside ditches to slow flowing water and further increase biofiltration. Additionally, roadway materials which may have come into contact with these tire-related contaminants through the summer season will be removed from the channel when the upper portion of the roadway is removed before winter rains occur, preventing their contact with the flowing waters of the Russian River.

2.6. Cumulative Effects

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

For the purpose of this analysis, the action area that is the subject of this opinion is limited to the bank to bank width of the Russian River at the Vacation Beach Summer Crossing Site, upstream approximately 500 feet and approximately one and half miles downstream, as described above in the Action Area section of this opinion. Actions occurring outside of the action area may affect the action area. For example, a new water diversion upstream may affect flows in the action area. Therefore, future actions occurring in the watershed may be considered cumulative effects, depending upon their specific location and impact. Future Federal actions, including the ongoing operation of dams, hatcheries, fisheries, water withdrawals, and land management activities will be reviewed through separate ESA section 7 consultation processes and are not considered here.

Additional development, tourism, and accompanying infrastructure construction is expected to occur in the Russian River Watershed based on the general and specific plans of local communities and Sonoma County. Additional development is likely to lead to increasing water demands, which may impact stream flows if current allocations are not being fully utilized. Agricultural activities surrounding the action area are primarily the cultivation of crops, mainly viticulture. The impacts of this land use on aquatic species include decreased bank stability, loss of shade and cover-producing riparian vegetation, increased sediment inputs, decreased ground and surface water supply, and elevated coliform bacteria levels. Vineyard development and management will continue to impact salmonid habitat by increasing sediment delivery to streams, diverting and decreasing stream flow, and encroaching on riparian habitat.

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).

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 as a whole for the conservation of the species.

The CCC coho salmon ESU is at a high risk of extinction, with the Russian River population being the largest historic population within the ESU. The availability of rearing habitat for coho salmon has been greatly reduced in the Russian River watershed and elsewhere as the result of numerous developmental activities. Coho salmon require especially cold water in which to rear, and developmental activities have undoubtedly limited the availability of such cold water habitats. High flow releases from the Warm Springs Dam during summer and fall months greatly limit the value of the PBFs of critical habitat for rearing coho salmon. Successful recovery of this species will very likely require protection, restoration, and enhancement of existing rearing habitats. Given that the Russian River is the largest watershed occupied by CCC coho salmon and that it is centrally located in this ESU, it is unlikely that the CCC coho can be recovered without a successful restoration of coho salmon habitat and runs in the Russian River.

The CCC steelhead DPS is at a moderate risk of extinction. As with other salmonid species, Steelhead populations have declined significantly. There is substantial fragmentation in their distribution associated with the intense urbanization pressures in and around the San Francisco bay area. However, the CCC steelhead have maintained higher numbers relative to other salmonids, and continue to utilize a wider range of habitat conditions. Their populations in coastal watersheds are widespread and fairly abundant. These conditions suggest steelhead may have a greater resilience to pe1iurbation than other salmonids.

The CC Chinook salmon ESU is at a moderate risk of extinction. While CC Chinook salmon have suffered substantial reductions in abundance and face many challenges to their successful reproduction, they have maintained a wide distribution and have had some positive return rates in recent years. This suggests that the threat of extinction for this species remains present; however, it is not imminent. Although the annual installation and removal of the summer crossing at Vacation Beach will likely have some adverse effect on rearing habitats for Chinook salmon, these effects will probably be minor because each year, proposed activities will affect only a small portion (less than 1 mile) of the 94 mile long main stem Russian River. This 94 mile segment effectively supports rearing habitat for juvenile Chinook salmon along its entire length and spawning habitat at riffles along the approximately 58 mile segment upstream from Healdsburg.

The majority of reproduction for Chinook salmon and steelhead occurs upstream of the action area. Therefore, a large percentage of both smolts and adults of Russian River Chinook salmon, and steelhead migrate through the action area. Remnant populations of coho salmon primarily spawn in lower river tributaries located near or upstream of the action area, thus a smaller percentage of both smolts and adults of Russian River coho salmon will also migrate through the action area. However, salmonid habitat conditions within the action area are generally poor and rearing habitat in the mainstem of the Russian River within the action area is marginal; primarily due to elevated stream temperatures, high rates of fine sediment loading, and the abundance of warm-water predator fish species. Overwinter and outmigration habitat conditions are also degraded because the mainstem channel lacks habitat complexity and velocity refuges in many areas and has an un-naturally high load of fine sediment due to extended releases of highly turbid water captured and stored behind dams during peak flow events (Ritter and Brown 1971; COE 1982; Beach 1996; California Department of Fish and Game 2001).

The timing of the project installation, removal, and use of the summer crossing will avoid the majority of both juvenile and adult migrations through the action area for Chinook salmon, coho salmon, and steelhead. However, the timing of the project removal will overlap with late out-migrating juvenile salmonids in some years, and will overlap with the beginning of upstream adult Chinook salmon migration in all years, with a very small possibility of overlapping coho adult migration that NMFS believes is discountable. NMFS believes the possibility of the project removal impacting adult coho upstream migration is discountable because upstream migration of coho salmon does not begin until the latter half of November (CDFG 2002), much later than the Chinook salmon upstream migration. In addition, a small number of juvenile coho and steelhead may rear in the action area and may be present during the project installation. Therefore, Chinook salmon adults and smolts, and rearing juvenile coho and steelhead and smolts are expected to be affected by the proposed actions. A small number of rearing coho and steelhead fry or juveniles, which do not flee the area where gravel is pushed into standing or flowing water at the Vacation Beach site, may be crushed while taking refuge in the interstices of the substrate. The behavioral modifications of juvenile Chinook and coho salmon and steelhead which may result from project impacts, (i.e., reduced feeding rates, occupation of less suitable habitat, and potentially greater intra and/or inter-species competition), will likely result in less fitness of individual fish. Reduced fitness of individual fish, along with potentially increased predation risks, may result in a minor reduction in survival rates.

Habitat changes resulting from this project is limited to a very small area. Based on habitat conditions within the action area and the timing of the primary adverse effects from installation and removal, NMFS expects that very few juvenile or adult salmonids will be present during installation, removal, and use of the summer crossing. The minimization measures contained within the proposed action minimize risks to listed salmonids and designated critical habitat. As a result, the effects of the project is not likely to appreciably reduce the numbers, distribution or reproduction of CC Chinook salmon or CCC coho and CCC steelhead and are not likely to diminish the value of designated critical habitat in the Russian River. Thus, appreciable reductions in the likelihood of survival and recovery of these populations, or the ESU/DPS, are not expected and the value of designated critical habitat is not likely to be diminished.

2.8. Conclusion

After reviewing the best available scientific and commercial information, the current status of the CC Chinook salmon ESU, CCC coho salmon ESU, and CCC steelhead DPS, the environmental baseline for the action area, the effects of the proposed COE ten-year CWA 404 permit to allow the continuation of the annual installation and removal of the summer crossing at Vacation Beach, and the cumulative effects, it is NMFS' biological opinion that the proposed continuation of the annual installation and removal of the crossing is not likely to jeopardize the continued existence of CC Chinook salmon, CCC coho salmon, or CCC steelhead or destroy or adversely modify designated critical habitat for these species.

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:

The continuation of the annual installation and removal of the summer crossing over the lower Russian River at Vacation Beach by the County of Sonoma, as permitted by the COE, is expected to result in incidental take of federally endangered CCC coho and threatened CC Chinook salmon and CCC steelhead. A small number of these salmonids may be herded with block-nets or crushed when gravel is put into the flowing water of the Russian River, or may become stranded in areas that get dewatered. These activities could result in injury or minimal mortality of a low number of Chinook and coho salmon smolts, steelhead smolts, and rearing juvenile coho salmon and steelhead. Adult and juvenile Chinook salmon, and coho salmon and steelhead juveniles and smolts may also be displaced and suffer an increased risk of predation, and may have behavioral modifications caused by the increase in turbidity and by the noise and vibrations of the heavy equipment used during installation and removal of each crossing. These behavioral modifications will likely result in less fitness of individual fish due to occupation of less suitable habitat, reduced feeding, and potentially greater intra and/or inter-species competition, which, along with increased predation risks, will result in a minor reduction in survival rates.

The number of Chinook salmon, coho salmon, and steelhead that may be incidentally taken during project activities has been determined to be very small, but cannot be accurately quantified because (1) the number of fish that may be present is likely low in number but is unknown; (2) the precise number of fish that may be herded, crushed, or stranded, although small, is unknown; (3) the number of fish that may be displaced or undergo other behavioral modifications due to the temporary turbidity plume is likely low, but unknown. In instances where NMFS cannot precisely determine the number of listed salmonids incidentally taken, surrogates such as the extent of habitat affected or modified by the proposed action are used.

Therefore, incidental take is limited to minimal mortality and harm associated with the installation of the Vacation Beach crossing. All salmonids present in the Vacation Beach portion of the action area annually during installation after June 15 may be harassed or harmed by project activities. For adult Chinook salmon potentially affected during removal of the crossing by minor harassment, no harm or lethal take is anticipated. Incidental take which results in mortality is limited to the juvenile Chinook and coho salmon and steelhead which may take refuge in the interstitial spaces of the substrate in the immediate area where gravel will be pushed into standing or flowing water, or those possibly stranded downstream due to minor dewatering of the river's edge. Incidental take which results in harm is limited to juvenile salmonids occupying the habitat for 2 miles downstream during the period of installation at Vacation Beach which may be subjected to a temporary turbidity plume causing behavioral modifications, which may result in a minor reduction in survival rates

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 CCC coho salmon, CCC steelhead, and CC Chinook salmon:

1. Measures shall be taken to minimize the amount or extent of incidental take resulting from the installation and removal of the summer crossing.

2. Implement measures to reduce direct delivery of contaminants from fuel leaks or run-off from road approaches and the steel and gravel bridges from being delivered into the river.

3. Ensure completion of a monitoring and reporting program to confirm that the take exemption for the proposed action is not exceeded, and that the terms and conditions in this ITS are effective in minimizing incidental take.

2.9.4. Terms and Conditions

The terms and conditions described below are non-discretionary, and the COE or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The COE 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.

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

1. The applicant shall retain a qualified biologist with expertise in the areas of salmonid and steelhead biology, behavior, habitat relationships; and biological monitoring. The applicant shall ensure that all fisheries biologists working on this project be qualified to monitor fish presence and behavior in a manner which minimizes all potential risks to ESA-listed Chinook salmon and steelhead.

2. The fisheries biologist shall monitor the construction site during placement and removal of the summer crossing to ensure that any adverse effects to Chinook and coho salmon and steelhead are minimized. The biologist shall be on-site during all construction events to ensure that all ESA-listed fish are avoided to the maximum extent practicable and any use of seining or block-nets is in accordance with BMPs developed to minimize potential harmful effects or mortality.

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

1. Construction equipment used within the river channel will be checked each day prior to work within the river channel (top of bank to top of bank) and, if necessary, action will be taken to prevent fluid leaks. If leaks occur during work in the channel, the County or their contractors will contain the spill and removed the affected soil.

2. Only non-petroleum based dust palliatives will be used during the summer crossing installation and removal.

The following terms and conditions implement reasonable and prudent measure 3:

1. In order to monitor the impact of incidental take, the COE or the County of Sonoma must notify the NMFS Santa Rosa Office by letter or email within 30 days after project completion and describe in detail any incidental take that occurred during the project. This shall include the species taken, date taken, type of take (injury or mortality), number taken, and fork length of any mortalities.

2. The applicant will prepare an implementation monitoring report for the first three years following the project and submit to NMFS annually by January 1. The monitoring report should include the following:

    a. Project identification;
    b. Permittee name, permit number, and project name;
    c. COE and County contact persons;
    d. Start and end dates of installation and removal activities;
    e. Summary of habitat conditions – Include photos (including both river banks, upstream and downstream views, and the bridge crossing itself) of the project site before, during and after installation and removal activities;
    f. Results of downstream turbidity monitoring before, during and after installation and removal activities.

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).

1. The COE and/or the County of Sonoma are encouraged to explore alternatives that would reduce or alleviate the need to place fill material in the flowing waters of the Russian River annually.

2. The DOE and/or the County of Sonoma should engage NMFS in early consultation and prepare a Biological Assessment in a timely manner towards the end of this 10-year project so as to avoid extension requests.

2.11. Reinitiation of Consultation

This concludes formal consultation for Russian River Summer Crossing at Vacation Beach in Guerneville, California. As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

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

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

(50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH [CFR 600.905(b)]

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

3.1. Essential Fish Habitat Affected by the Project

Pacific coast salmon EFH may be adversely affected by the proposed action. Specific habitats identified in the PFMC (2014) for pacific coast salmon include habitat areas of particular concern (HAPCs), identified as: 1) complex channels and floodplain habitats; 2) thermal refugia; and 3) spawning habitat. HAPCs for coho salmon and Chinook salmon include all waters, substrates, and associated biological communities falling within critical habitat areas described above in the accompanying biological opinion for the project located on the mainstem of the Russian River. The existing habitat at the project site lacks adequate in-stream cover and experiences too much solar exposure to provide good habitat for coho salmon or Chinook salmon year-round. There is no spawning habitat within the project location. However the site provides a migration corridor for adults and juveniles of both species.

3.2. Adverse Effects on Essential Fish Habitat

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

3.3. Essential Fish Habitat Conservation Recommendations

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

3.4. Supplemental Consultation

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

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion is the COE and the County of Sonoma. Individual copies of this opinion were provided to these agencies. The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. 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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