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

November 19, 2021 **Refer to NMFS No:** WCRO-2021-01688

Tom Holstein
Environmental Branch Chief
California Department of Transportation, District 4
P.O. Box 23660, MS-1A
Oakland, California 94623-6371

Re: Endangered Species Act Section 7(a)(2) Biological Opinion for the Geysers Road over Frasier Creek Bridge Replacement Project

Dear Mr. Holstein;

Thank you for your letter of November 6, 2019, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Geysers Road over Frasier Creek Bridge Replacement Project (project). The bridge is located on Geysers Road, approximately 10 miles east of the town of Cloverdale, in Sonoma County, California. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

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. However, after reviewing the proposed action, we concluded that it would not adversely affect EFH, therefore, no EFH consultation is required.

The enclosed biological opinion is based on our review of the proposed projects and describes NMFS' analysis of the potential effects on endangered CCC coho salmon (*Onchorhynchus. kisutch)*, and threatened Central California Coast (CCC) steelhead (*O. mykiss*) and California Coastal (CC) Chinook salmon (*O. tshawytscha)*, and on designated critical habitat in accordance with section 7 of the ESA.

The enclosed biological opinion is based on our review of California Department of Transportation (CalTrans)[1] proposed project and describes NMFS' analysis of potential effects on threatened Central California Coast (CCC) steelhead and the designated critical habitat for the species. NMFS concludes that the project is not likely to jeopardize the continued existence of the species; nor is it likely to destroy or adversely modify critical habitat. However, NMFS anticipates take of CCC

[1] Caltrans is acting as the lead agency under direction of the June 2007 Memorandum of Understanding (MOU) (23 U.S. C. 326) between Caltrans and the Federal Highway Administration. As assigned by the MOU, Caltrans is responsible for the environmental review, consultation and coordination on this project.

steelhead in the form of injury or mortality during dewatering activities. An incidental take statement with non-discretionary terms and conditions is included with the enclosed biological opinion. NMFS has also found that the proposed project is not likely to adversely affect CC Chinook salmon, or designated salmonid critical habitat. Finally, this opinion includes a determination of may affect but not likely to adversely affect for CCC coho salmon and their designated critical habitat. This determination was made because CCC coho habitat does not occur in the action area or areas of the upper Russian River and the species has not been present in the upper basin for decades.

Please contact Andrew Trent of the NMFS North-Central Coast Office in Santa Rosa, California at (707)-578-8553, or andrew.trent@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: Keevan Harding, Caltrans, Oakland, CA, keevan.harding@dot.ca.gov
Copy to ARN File #151422WCR2021SR00129

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

Geysers Road Over Frasier Creek Bridge Replacement Project

NMFS Consultation Number: WCR0-2021-01688
Action Agency: California Department of Transportation

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely to Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely to Destroy or Adversely Modify Critical Habitat?
Central California Coast steelhead (*Oncorhynchus mykiss*))	Threatened	Yes	No	Yes	No
California coastal Chinook (*O. tshawytscha*)	Threatened	No	N/A	N/A	N/A
Central California Coast coho salmon (*O. kisutch*	Threatened	No	N/A	No	N/A

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

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Date: November 19, 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 Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.), as amended, and implementing regulations at 50 CFR part 402.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at NMFS North-Central Coast Office in Santa Rosa, California (ARN#151422WCR2021SR00129).

1.2. Consultation History

- February 15, 2018: NMFS met on site with the California Department of Transportation (Caltrans), the California Department of Fish and Wildlife (CDFW) and representatives of the Sonoma County Department of Transportation and Public Works (DTPW) to discuss construction methods, biological impacts, and potential avoidance measures.

- May 7, 2021: NMFS received an email from Caltrans that included: 1) a letter requesting initiation of Section 7 consultation for potential impacts on CCC steelhead and their designated critical habitat, CCC Coho, and CC Chinook salmon and their critical habitat due to implementation of the proposed project; and 2) the April 2021 Biological Assessment (BA) for the Geysers Road over Frasier Creek Bridge Replacement Project, Sonoma County, Bridge No. 20C0227, Caltrans and the Sonoma County DPW, Caltrans District 4, No. BRLO-5920(129).

- June 29, 2021: NMFS emailed Caltrans inquiring the extent of proposed dewatering for the Project, as well as any Low Impact Designs regarding stormwater management that will be implemented.

- July 9, 2021: Caltrans responded to NMFS via email with the requested information, providing NMFS with sufficient information to initiate formal consultation.

1.3. Proposed Federal Action

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

The Sonoma County DTPW proposes to construct a new bridge on the existing alignment of Geysers Road over Frasier Creek. Traffic on Geysers Road will be conveyed over a one-lane temporary bridge that will be constructed on the upstream alignment. The new bridge will be 80 feet long with the new abutments located further up the creek bank from the existing abutments. A single span bridge is proposed, consisting of a cast-in-place reinforced concrete box girder type approximately 32 feet wide, with two 11-foot travel lanes and two 3-foot shoulders with no bikes lanes or sidewalks. The abutment supports will be 24-inch Cast-In-Drilled-Holes (CIDH) piles. RSP will be installed to protect the abutments, with approximately 65-70 linear feet with 385 square feet of RSP placed below the Ordinary High Water Mark (OHWM). The elevation for the new bridge deck would be approximately 745 feet above sea level, allowing passage of 100-year flood level events.

The temporary bridge will be 18 feet wide by a minimum of 55 feet long to clear the low flow channel. The temporary bridge will require temporary reinforced concrete spread footings. The hillside where the temporary bridge will be constructed has a steep slope. In order to retain this hillside, a temporary shoring wall is required along the northwest side approximately 120 feet in length. After demolition of the existing bridge and construction of the new bridge is complete, the temporary bridge including the abutments and shoring walls will be removed and the adjacent hillside will be graded back to a stabilized slope.

1.3.1. Construction Activities

Work in Frasier Creek is required to remove the existing superstructure, pier wall, abutments, sacked concrete, slope protection (grouted rock) and their respective foundations. If encountered, piles will need to be removed to a minimum of three feet below original ground. Likewise, placement and later removal of bridge falsework will also take place at the edge of the creek channel. After traffic is switched to the new bridge from the temporary, removal of the temporary bridge will be required which includes temporary abutments and shoring wall.

Vertically, fill will be placed to meet the new required bridge grade. Approximately 160 feet of approach work is required on the southwest end and approximately 285 feet on the northeast end. The approach would also be widened with two 11-foot lanes and two 3-foot shoulders. Midwest guardrail systems will be installed along all four corners of the bridge approximately 75 feet in advance of the new bridge abutments. Existing ditches adjacent to the Project site would need to be filled, and temporary ditches would be constructed that would convey water into Big Sulphur Creek.

Sonoma DTPW will construct the project over one construction season, with work in the wetted channel occurring between June 15 and October 15. Vegetation removal will occur during the winter preceding construction, to avoid the bird-nesting season. Vegetation removal includes removal and pruning of shrubby riparian vegetation along the bridge alignment, and approximately 15 trees of various species. Tree removal has been minimized to the fewest necessary in order to maximize the amount of out of creek space used for construction, staging, and debris removal.

1.3.2. Temporary Creek Diversion System and Work Pad Installation

Construction access to the work within Frasier Creek will require temporary dewatering of a maximum of 100 feet of stream channel. A temporary creek diversion system will be constructed to

divert creek flow through the worksite during the proposed construction season. After June 15, block nets would first be installed at the upstream end of the pad by a qualified fisheries biologist. Fish would then be herded downstream out of the project area to the extent feasible. A downstream block net would then be installed to create an isolated work area. Next, flexible 24-inch polyethylene culvert(s) with temporary cofferdams located at the upstream and downstream ends will be installed. The biologist will relocate any fish remaining in the work area to suitable habitat. Culvert(s) will be placed on the streambed to limit water contact with the construction work pad. Hydraulic conditions within the culverts will be appropriate for aquatic habitat life. Prior to placing the culverts, any low spots within the culvert alignment will be leveled by placing small amounts of clean river run gravel on the stream bed. Excavation of the channel bottom is not necessary. Culverts will be placed with equipment operating from the existing gravel bar, outside the flowing water. Culverts will be installed to avoid a backwater on the upstream end of the work pad and increasing water velocities at the outlet of the culverts. The number and size of culverts used will be determined based on stream flow.

Once the bypass culverts are in place, a dam of imported clean river-run gravel and K-rails will be used to direct flowing water into the culverts. Dam construction will be limited to equipment operating from the dry side of the channel, outside the flowing water. The diversion dam will be lined with impermeable plastic and will be located approximately 45 feet upstream of the existing bridge structure. A filter dam, lined with filter fabric, will be constructed at the downstream end of the work pad. Material to construct the downstream dam will be lowered into the channel by an excavator working from the existing gravel bar.

Once the upstream and downstream dams are in place, the work pad (approximately 2,400 cubic yards) will be completed by filling in the confined pool between the dams with imported clean river-run gravel and a top layer of crushed rock to create a surface suitable for operation of large equipment. A fabric layer could be placed between river-run gravel and base rock layer to ease removal following construction. Gravel will be placed at such a rate that displaced water does not overtop either dam. This will be accomplished by either pumping out the trapped water while depositing the clean river-run gravel or by adding the gravel slowly enough for the filter dam to sieve the water through its mesh. If water is pumped out it will be pumped up into a holding tank for storage and disposal or to an upland location where it will not drain along the ground surface back into the creek. The layer of compactable aggregate (crushed rock) to be placed on top of the river run gravel would not exceed the minimum amount needed to provide sufficient support for the safe and efficient operation of heavy equipment. Loss of compactable aggregate over the edges of the work pad would be avoided by maintaining a minimum 3-foot buffer of uncovered river-run gravel at the ends of the work pad. The block nets would be removed once the pad was complete and the gravel will be left in the stream channel where the excess grouted rock and concrete has been excavated

1.3.3. Temporary Bridge

The temporary bridge will be about 55 feet long by 18 feet wide clear span concrete bridge over Frasier Creek. All work on the temporary bridge will be performed from the top of the roadway and outside of the Frasier Creek stream channel. Temporary shoring walls or new engineered fills are required to grade a new temporary road into the steep side slopes north of the existing alignment. A 120-foot temporary shoring wall will be constructed on the northwest approach and a 40-foot on the northeast. Engineered fills would be used in lieu of retaining walls where feasible. Temporary K-

rails would be placed across Geyser Road on both the west and east ends of the existing bridge in order to guide vehicles along the temporary alignment as well as provide a construction zone for safety. Temporary striping and stop signs will be used to direct one-way traffic around the bridge construction.

1.3.4. Work Pad Removal

Following completion of in-channel work, and prior to October 15, the work pad would be removed as described below. Immediately prior to work pad removal, block nets, or another suitable method identified by a fisheries biologist, will be installed upstream of the work pad to prevent fish from entering the culvert(s). The culvert(s) will be lifted out of the channel, starting upstream and draining downstream. A qualified biologist would be on-site during culvert removal. The biologist would inspect any areas of ponded water created by the removal of each section of culvert to ensure they are clear of fish. Then workers using hand shovels or the bucket of the excavator would smooth out the gravel to re-establish normal flow through the channel created where the culvert was removed. The remaining river-run gravel would be left in the channel to be transported downstream with winter flows. After the pad has been smoothed and the re-established channel has stabilized, all equipment will be removed from below top of the bank, along with all surplus materials and debris. The block nets will be removed and fish will be allowed to return to the site. Temporary disturbance areas above the top-of-bank (excluding pre-existing disturbed areas such as the road shoulder, pullout, and existing access) would be seeded with an erosion control mix.

1.3.5. Conservation Measures

Section 2.4 of the biological assessment (Caltrans 2021) is incorporated here by reference and describes several construction methods and best management practices that will be implemented to avoid and minimize impacts to listed species and their habitat in the action area including, but not limited to:

- Erosion and Sediment Control
- Prevention of Accidental Spills and Pollution
- Air Quality and Dust Control
- Vegetation Replacement in Riparian Areas – Specifically, onsite restoration will occur in areas that have been disturbed during project construction and within interstitial spaces of the RSP. The amount of habitat created/restored will be at a 3:1 ratio of new plantings per large (6 in. in diameter at breast height) woody plant removed. This replanting ratio will help ensure successful establishment of at least one vigorous native plant for each plant removed.
- Prevention of Spread of Invasive Species.

Additionally, post construction BMPs will be implemented to treat runoff from the new impervious areas. Runoff will be routed to treatment basins, through vegetated swales or across vegetated buffer strips to treat for any pollutants from the roadway prior to discharge into Big Sulphur or Frasier creeks.

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

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

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

2.1. Analytical Approach

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

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

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

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

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

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.

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

2.1.1. Use of Best Available Scientific and Commercial Information

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

- Biological Assessment: Geysers Road over Frasier Bridge Replacement Project, Sonoma County, CA. 04-SON-0CR. April 2021. (Caltrans 2021).
- CDFW Stream Inventory Report: Frasier Creek. 2006. (CDFW 2006).
- CDFW Stream Inventory Report: Big Sulphur Creek. 2006 (CDFW 2006).
- NMFS Final Coastal Multispecies Recovery Plan: CC Chinook Salmon, Northern California Steelhead, CCC Steelhead. West Coast Region, Santa Rosa CA. October 2016. (NMFS 2016).
- A History of the Salmonid Decline in the Russian River. Steiner Environmental Consulting. August 1996.
- SCWA. 2003. Sonoma County Water Agency. Upper Russian River Steelhead Distribution Study. March 2003.

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. A complete administrative record of this consultation is on file at the NMFS North-Central Coast Office in Santa Rosa, California (Administrative Record Number 151422WCR2021SR00129).

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis. The opinion also examines the condition of critical habitat

throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the PBFs that are essential for the conservation of the species.

This biological opinion analyzes the effects of the proposed action on the following listed species Distinct Population Segment (DPS) and designated critical habitat:

Threatened Central California Coast (CCC) steelhead
Listing determination (71 FR 834; January 5, 2006)
Critical habitat designation (70 FR 52488; September 2, 2005).

2.2.1. CCC Steelhead Status

Historically, approximately 70 populations[2] of steelhead existed in the CCC steelhead DPS (Spence *et al.* 2008, Spence *et al.* 2012). Many of these populations (about 37) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts (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). Recent estimates for the Russian River are on the order of 4,000 fish (NMFS 1997). 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). 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. For more detailed information on trends in CCC steelhead abundance, see: Busby *et al*. 1996, NMFS 1997, Good *et al*. 2005, Spence *et al*. 2008, Williams *et al.* 2011, and Williams *et al.* 2016.

CCC steelhead have experienced serious declines in abundance and long-term population trends suggest a negative growth rate. This indicates the DPS may not be viable in the long term. DPS populations that historically provided enough steelhead immigrants to support dependent populations may no longer be able to do so, placing dependent populations at increased risk of extirpation. However, because CCC steelhead remain present in most streams throughout the DPS, roughly approximating the known historical range, CCC steelhead likely possess a resilience that is likely to slow their decline relative to other salmonid DPSs or Evolutionarily Significant Units (ESUs) in worse condition. The 2005 status review concluded that steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Good *et al*. 2005). On

[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. These authors use this definition as a starting point from which they define four types of populations (not all of which are mentioned here).

January 5, 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834).

A more recent viability assessment of CCC steelhead concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable, and that the limited information available did not indicate that any other CCC steelhead populations could be demonstrated to be viable[3] (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 shows a decline in returning adults across their range compared to the last ten years (Jeffrey Jahn, NMFS, personal communication, 2010). The most recent status update concludes that steelhead in the CCC steelhead DPS remains "likely to become endangered in the foreseeable future" (Howe, 2016), as new and additional information available since Williams *et al.* (2011) does not appear to suggest a change in extinction risk.

2.2.2. Status of CCC Steelhead Critical Habitat

In designating critical habitat, NMFS considers, among other things, the following requirements of the species: 1) space for individual and population growth, and for normal behavior; 2) food, water, air, light, minerals, or other nutritional or physiological requirements; 3) cover or shelter; 4) sites for breeding, reproduction, or rearing offspring; and, generally; and 5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on PBFs and essential habitat types within the designated area that are essential to the conservation of the species and that may require special management considerations or protection (81 FR 7414).

PBFs for critical habitat, and their associated essential features within freshwater include:

1. freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;
2. freshwater rearing sites with:
    a. water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
    b. water quality and forage supporting juvenile development; and
    c. 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;
3. 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.

The condition of CCC steelhead critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the

[3] Viable populations have a high probability of long-term persistence (> 100 years).

following human-induced factors affecting critical habitat[4]: logging, agriculture, mining, urbanization, stream channelization and bank stabilization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Habitat 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/quantity, lost riparian vegetation, and increased sediment delivery into streams from upland erosion (Weitkamp *et al*. 1995; Busby *et al.* 1996; 64 FR 24049; 70 FR 37160; 70 FR 52488). In addition, widespread diverting of rivers and streams, as well as the pumping of groundwater hydraulically connected to stream flow, has dramatically altered the natural hydrologic cycle in many of the streams within steelhead DPSs, which can delay or preclude migration and dewater aquatic habitat.

2.2.3. Global Climate Change

One factor affecting the range-wide status of the CCC steelhead DPS, and aquatic habitat at large is climate change. Impacts from global climate change are already occurring in California. For example, average annual air temperatures, heat extremes, and sea level have all increased in California over the last century (Kadir *et al*. 2013). Snow melt from the Sierra Nevada has declined (Kadir *et al*. 2013). However, total annual precipitation amounts have shown no discernable change (Kadir *et al*. 2013). CCC steelhead may have already experienced some detrimental impacts from climate change. NMFS believes the impacts on listed salmonids to date are likely fairly minor because natural, and local climate factors likely still drive most of the climatic conditions steelhead experience, and many of these factors have much less influence on steelhead abundance and distribution than human disturbance across the landscape. In addition, CCC steelhead are not dependent on snowmelt driven streams and, thus, not affected by declining snow packs.

The threat to CCC steelhead from global climate change will increase in the future. Modeling of climate change impacts in California suggests that average summer air temperatures are expected to continue to increase (Lindley *et al*. 2007, Moser *et al*. 2012). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe *et al*. 2004, Moser et al. 2012, Kadir *et al.* 2013). Total precipitation in California may decline; critically dry years may increase (Lindley *et al*. 2007, Schneider 2007, Moser *et al*. 2012). Wildfires are expected to increase in frequency and magnitude (Westerling *et al*. 2011, Moser *et al*. 2012).

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 experience a higher degree of variability of annual precipitation during the next 50 years and years that are drier than the historical annual average during the middle and end of the 21st Century. The greatest reduction in precipitation is projected to occur in March and April, with the core winter months remaining relatively unchanged (Cayan *et al.* 2012).

[4] 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.

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). The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007, Santer *et al*. 2011).

2.3. Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the project encompasses the active channel 500 feet upstream and 150 feet downstream of the bridge. This includes the active channel of Frasier Creek where the existing bridge crosses the creek, the banks disturbed by RSP placement, the bypass culverts, and the channel downstream to include the length of the waterway in which any temporary disruption to habitat (e.g., fine sediment plume) might be detectable. Additionally, the action area includes 500 feet upstream and 150 feet downstream of the construction site to the confluence with Big Sulphur where fish relocation activities may occur.

2.4. Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The 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).

2.4.1. Status of CCC Steelhead and Critical Habitat in the Action Area

Little quantitative data is available for the size of recent steelhead runs on Frasier Creek, though there are extensive anecdotal records of steelhead on Frasier Creek and observations of spawning (NMFS 2001). Juvenile steelhead have been observed during site visits. Adult steelhead may be present at the site during the spawning season of late fall to April, and young steelhead could be present at any time of year. During electrofishing surveys on Big Sulphur Creek (confluence of Frasier with Big Sulphur is 150 feet downstream of bridge site) in 2006, roach, sculpin, sucker, and steelhead were found (CDFW 2006). Steelhead likely utilize the action area for rearing, though elevated stream temperatures during the summer may limit juvenile rearing opportunities. Many juvenile steelhead likely move downstream into the mainstem Russian River where summer stream temperature may be suitable in wet years due to water cold-water releases from Lake Mendocino (SCWA 2003).

Frasier Creek within the action area is primarily composed of a narrow riffle section of smooth boulder substrate. At the bridge site rock and concrete line the channel where scour has occurred. Flow currently runs above and below the grouted rock. On the April 2018 site visit, flow was approximately one foot deep at the thalweg just upstream of the bridge. Streambed incision has reduced salmonid habitat function within the action area. Additional impacts due to river incision include the loss bank stability and riparian vegetation and increased stream temperatures which reduces rearing habitat quality for juvenile steelhead. Reduced habitat quality in this reach has likely led to reduced numbers of juvenile salmonids utilizing this area and a reduced number of steelhead within this portion of the Russian River watershed.

2.4.2. Factors Affecting the Species Environment in the Action Area

Frasier Creek watershed drains a watershed area of approximately 3.81 square miles, discharging into Big Sulphur Creek within the western slopes of the Mayacamas, and ultimately into the Russian River. A vast majority of the watershed is privately owned. Land uses in the watershed are dominated by grazing, very low density rural residences, private hunting, and electricity production at the Geysers geothermal resource area. Major vegetation communities in the watershed include grassland, oak woodland, and oak/bay woodland, as well as chaparral and pine forest at the upper elevations. The project is located in the Mayacamas Mountains, within the canyon of Big Sulphur Creek. Frasier Creek is a tributary stream that has its confluence with Big Sulphur Creek approximately 150 ft. downstream of the action area. In general, this canyon is narrow and steep, occasionally broadening into shallow valleys. Steep slopes and ridges up to 2,900 feet in elevation characterize the topography in the general vicinity. Approaching the bridge on Geysers Road, the topography of the area consists of steep road cut and slopes adjacent to the road, and the creek channels on each side at the bridge location. The bridge is at 750 feet above sea level. The roadway crosses over Frasier Creek, which flows in a southern direction into Big Sulphur Creek.

Habitat conditions throughout the Russian River watershed have been impacted by agricultural development and rural development over the past 150 years. Many landowners have encroached on the floodplain, reduced the riparian areas along the river and many divert stream flow for vineyards and domestic purposes. In general, these actions have created stream conditions throughout the valley reaches of the Russian River tributaries that have less than optimal flows and stressful temperature conditions for juvenile steelhead (Steiner Environmental Consulting 1996). CDFW has conducted many biological inventories of Big Sulphur Creek and results suggest that Big Sulphur has historically been a problem area for salmonids, being highly influenced from the energy development operations waste discharges, high water temperatures and the presence of predacious non-native fish (CDFW 2006).

2.4.3. Previous Section 7 Consultations Affecting the Action Area

No known previous Section 7 consultations have occurred within the action area.

2.5. Effects of the Action

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

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

Construction activities associated with the proposed project may affect CCC steelhead and their habitat. The following may result from construction activities: unintentional direct mortality during fish collections, relocations, and dewatering activities; temporary loss of benthic habitat, reductions in riparian vegetation and cover, and temporary impacts to channel bed morphology.

2.5.1. Dewatering and Fish Relocation Activities

The proposed project may require dewatering and relocation of steelhead during construction period. The stream channel within the project site will be dewatered and fish will be removed and relocated to an appropriate stream reach that will minimize impacts to captured fish as well as fish that are residing at the release site. Fish relocation activities may injure or kill rearing juvenile steelhead because of the associated risk that collecting poses to fish, including stress, disease transmission, injury, or death (Hayes 1983). The amount of injury and mortality attributable to fish capture varies widely depending on the method used, the ambient conditions, and the expertise and experience of the field crew. The effects of seining and dip-netting on juvenile steelhead include stress, scale loss, physical damage, suffocation, and desiccation. Electrofishing can kill juvenile steelhead, and researchers have found serious sub-lethal effects including spinal injuries (Nielsen 1998, Nordwall 1999). Based on prior experience with current relocation techniques and protocols likely to be used to conduct the fish relocation, unintentional mortality of juvenile CCC steelhead expected from capture and handling procedures is not likely to exceed three percent. Mortality from these activities can be reduced to near one percent with increased skill and experience of the operator, and field crew conducting the work.

Although sites selected for relocating fish will likely have similar water temperature as the capture site and should have ample habitat, in some instances relocated fish may endure short-term stress from crowding at the relocation sites. Relocated fish may also have to compete with other native and non-native fishes for available resources such as food and habitat. Some of the fish at the relocation sites may move and reside in areas that have more suitable habitat and lower fish densities. As each fish moves, competition is expected to remain localized to a small area or quickly diminish as fish disperse.

Most of the impacts to CCC steelhead associated with fish relocation is anticipated to be non-lethal, however, a very low number of rearing juveniles (mostly young of the year) captured may be injured or die. The number of CCC steelhead affected by increased competition is not expected to be significant at most fish relocation sites, based upon the suspected low number of relocated fish inhabiting the small project areas.

Effects to CCC steelhead associated with fish relocation activities are expected to be significantly reduced by implementing measures to reduce stress and potential for injury or death (Caltrans 2021). NMFS expects that fish relocation activities associated with this action will not significantly reduce the number of returning CCC steelhead adults. Fish relocation activities will occur during the summer low-flow period after emigrating smolts have left the proposed project site and before adult fish travel upstream in the late fall. Therefore, the majority of CCC steelhead that may be captured will be juveniles, generally young of the year and one-year age classes. Although most

mortalities of steelhead during relocation activities are likely to occur almost exclusively at the young of the year stage, there is a potential of unintentional mortality of older age-class fish.

2.5.2. Increased Mobilization of Sediment in the Stream Channel and Water Quality

The proposed action would result in the disturbance of the streambed and banks for equipment access and construction. Disturbed soils may become mobilized when fall and winter rains return subsequent to construction. NMFS anticipates these activities would result in small short-term increases in turbidity during rewatering and subsequent higher flows caused by winter storms after construction is completed. Instream and near-stream construction activities have been shown to result in temporary increases in turbidity (reviewed in Furniss et al. 1991, Reeves et al. 1991, and Spence et al. 1996).

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

Although sediment and turbidity may affect listed salmonids as described above, sedimentation and turbidity levels associated with the proposed Project, including bridge removal and replacement, temporary bridge installation and removal, removal of concrete debris from the channel, and placement of RSP, are not expected to rise to the levels discussed in the previous paragraph because the Project proposes several measures to prevent the mobilization of sediment during and after construction. During construction, NMFS expects sediment input to the creek would be minimal, because the Project proposes to control exposed soil by stabilizing slopes and protecting channels (e.g., using silt fences and straw wattles).

Post-construction, modified or disturbed portions of the stream channel, banks, and riparian areas would be restored as nearly as possible to natural and stable contours (elevations, profile, and gradient). Native substrates removed during excavations and earthwork would be stockpiled and returned to the creek bed and banks. A native grass seed mix would be applied to areas disturbed by construction, creek access, and contouring, as well as to areas where native soils overlay the buried RSP. Riparian habitat areas temporarily disturbed shall be replanted using riparian species that have been recorded along the Frasier Creek in the action area, including willow (*Salix lasiolepis* and *Salix laevigata*), white alder (*Alnus rhombifolia*), Bay Laurel (Laurus nobilis), CA Buckeye (Aesculus californica), Fremont cottonwood (*Populus fremontii*) Live Oak (*Quercus wislizenii*) and Valley Oak (*Quercus lobata*). Onsite restoration will occur in areas that have been disturbed during project construction and within interstitial spaces of the RSP. The amount of habitat created/restored shall be at a 3:1 ratio of new plantings per large (6 in. in diameter at breast height) woody plant removed. This replanting ratio will help ensure successful establishment of at least one vigorous plant for each plant removed to accommodate the project. Revegetation monitoring would

be implemented and be initiated immediately following completion of the planting. The monitoring surveys will consist of a general site walkover evaluating the survival and health of riparian plantings, signs of drought stress, weed or herbivory problems, and the presence or trash or other debris. If monitoring results indicate that revegetation efforts are not meeting established success criteria, corrective measures would be implemented.

NMFS anticipates any resulting elevated turbidity levels would be small and only occur for a short time, well below levels and durations shown in scientific studies as causing injury or harm to salmonids (see for example Newcombe and Jensen 1996). NMFS expects any sediment or turbidity generated by the Project would not extend more than 100 feet downstream of the work site based on site conditions (low flows) and methods used to control sediment and turbidity. NMFS does not anticipate harm, injury, or behavioral impacts to CCC steelhead associated with exposure to elevated suspended sediment levels that would be generated by this Project.

Additionally, some post construction storm water BMPs were proposed as part of the project to address water quality concerns associated with road projects as detailed by numerous sources such as the California State Water Resources Control Board (CSWRCB). 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 as the causal factor in salmonid mortalities at concentrations of less than a part per billion (Tian et al., 2020). 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). Diverting the stormwater runoff into a vegetated area prior to entering the waterbody, allows it to infiltrate into soils through large amounts of organic matter. This infiltration is expected to mitigate deleterious effects to salmonids by the process of binding the 6-PPD quinone, filtering out tire particles, and removing other contaminants related to automobiles (polycyclic aromatic hydrocarbons, oil, greases, metals, etc.) by preventing it from reaching the waterbody (Caltrans 2003; McIntrye et al. 2015).

Mortality is expected to be insignificant due to the rural setting of the road and the addition of impervious surfaces being minimal. Furthermore, runoff will be routed to treatment basins, through vegetated swales or across vegetated buffer strips to treat for any pollutants from the roadway prior to discharge into Big Sulphur or Frasier creeks. This should reduce the amount of stormwater runoff, including 6-PPD quinone, from flowing directly into the waters of Big Sulphur or Frasier Creeks.

2.5.3. Impacts to Channel Form and Function

RSP and other cut and fill work would impact approximately 65-75 linear feet at each abutment with 385 cubic yards below the OHWM of Frasier Creek. By design, streambank stabilization projects prevent lateral channel migration, effectively forcing streams into a simplified linear configuration that, without the ability to move laterally, instead erode and deepen vertically (Leopold et al. 1968; Dunn and Leopold 1978). The resulting “incised” channel fails to create and maintain aquatic and riparian habitat through lateral migration, and can instead impair groundwater/stream flow connectivity and repress floodplain and riparian habitat function. The

resulting simplified stream reach typically produces limited macroinvertebrate prey and poor functional habitat for rearing juvenile salmonids (Florsheim et al. 2008).

The proposed RSP and channel armoring for this project is expected to maintain simplification of habitat in the future. However, by reducing the amount of fill in the Project area through the removal of the existing mid-channel abutment and concrete debris in the stream under the existing bridge, the new bridge abutments will encroach less on the stream channel as compared to existing bridge. The reduction of fill in the creek is expected to allow the stream channel to transport sediment and develop a natural pool, and riffle sequence. Disturbance from using heavy equipment in the streambed is expected to be minimized with winter high flow events that will redistribute gravels and restore channel form.

2.5.4. Toxic Chemicals

Oils and similar substances from construction equipment can contain a wide variety of polynuclear aromatic hydrocarbons (PAHs) and metals. Both can result in adverse impacts to salmonids. PAHs can alter salmonid egg hatching rates and reduce egg survival as well as harm the benthic organisms that are a salmonid food source (Eisler 2000). Some of the effects that metals can have on salmonids are immobilization and impaired locomotion, reduced growth, reduced reproduction, genetic damage, tumors and lesions, developmental abnormalities, behavior changes (avoidance), and impairment of olfactory and brain functions (Eisler 2000).

The Project has proposed several measures to prevent the discharge of contaminants and avoid degradation of creek waters during construction activities. The stream would be dewatered when construction equipment is working in the streambed; spill containment and remediation material would be nearby; and vehicles would not be fueled or otherwise serviced within the streambed. Due to these measures, NMFS expects that an accidental spill and toxic chemical contamination of the action area would be unlikely.

2.5.5. Impacts to Critical Habitat

Features of critical habitat for CCC steelhead found within the action area include sites for migration, spawning, and rearing. Effects of the proposed project on designated critical habitat may include elevated turbidity, streambank and floodplain habitat degradation, and precluding natural fluvial and geomorphic channel dynamics.

Caltrans proposes to place RSP to protect the new bridge. Bio-engineering techniques such as willow sprig planting through the riprap and will be used. In order to place the rip-rap armoring onto the streambank, heavy machinery will dig within the streambank for access to the site and disrupt the streambed to excavate a toe trench for placing rip-rap. The proposed disturbance of the site will likely dislodge previously armored and sequestered inter-gravel fine sediment and allow it to be mobilized and transported downstream when the action area re-waters the following fall.

As mentioned above, streambank stabilization projects prevent lateral channel migration and simplify the channel. The 65-70 feet of RSP and the 385 cubic feet of RSP installed below OHWM will hinder channel migration and riparian development along Frasier Creek. However, with the removal of concrete debris and the existing abutment in the center channel, the new span bridge will encroach less on the stream channel as compared to existing bridge. The reduction of fill in the

creek is expected to allow the stream channel to transport sediment, develop a natural pool, and riffle sequence. Therefore, the project is unlikely to compromise the value of available critical habitat in the action area for the foreseeable future.

2.6. Cumulative Effects

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

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

2.7. Integration and Synthesis

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

The Frasier Creek and Big Sulphur Creeks' watershed is part of the Upper Russian River "independent" population, and serves an essential role in CCC steelhead recovery efforts (NMFS 2016). A small number of steelhead inhabiting the action area will experience a higher likelihood of perishing prior to reaching adulthood and spawning, primarily due to reduced fitness and growth brought about by the proposed bridge replacement project construction and its negative impact on instream habitat. However, the anticipated small loss of juvenile steelhead is unlikely to appreciably impact the future survival and recovery at the DPS scale, since adequate quantities of habitat remain within the tributary reaches of the Frasier Creek, where the lost production can be regained.

As described in the *Effects of the Action* section above, NMFS identified dewatering and fish relocation as the adverse effects on CCC steelhead in the action area that would result from the proposed Project. Prior to dewatering a maximum of 100 linear feet of creek for construction, fish would be collected and relocated from the work area. Fish that elude capture and remain in the Project area during construction activities would likely die due to desiccation or thermal stress, or be crushed by heavy equipment during construction operations. However, based on the low mortality rates for similar capture and relocation efforts, NMFS anticipates few juvenile steelhead would be injured or killed by fish relocation and construction activities during implementation of this Project. Due to the relatively large number of juveniles produced by each spawning pair,

steelhead spawning in the Frasier Creek watershed in future years are likely to produce enough juveniles to replace the few that may be lost at the Project site due to relocation and dewatering. It is unlikely that the small potential loss of juveniles by this Project would impact future adult returns.

Global climate change presents another real threat to the long-term persistence of CCC steelhead, especially when combined with the current depressed population status and human caused impacts. Regional (*i.e.,* North America) climate projections for the mid to late 21st Century expect more variable and extreme inter-annual weather patterns, with a gradual warming pattern in general across California and the Pacific Northwest. However, extrapolating these general forecasts to our smaller action area is difficult, given local nuances in geography and other weather-influencing factors. Water temperatures may rise somewhat in the action area due to climate change over the next several decades, reinforcing the likelihood of reduced carrying capacity in the action area due to bank stabilization as described above.

The proposed action will degrade PBFs and essential habitat types in the action area, namely those related to juvenile rearing. Yet, the effects of the proposed action, when added to the environmental baseline, cumulative effects, and species status, are not expected to appreciably reduce the quality and function of critical habitat at the larger CCC steelhead DPS, given the small area being degraded compared to the quality and quantity of habitat within the Russian River watershed. Thus, the proposed action will not impair the ability of critical habitat to play its intended conservation role of supporting populations of CCC steelhead at the DPS level.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the action is not likely to jeopardize the continued existence of CCC steelhead or destroy or adversely modify its designated critical habitat.

2.9. Incidental Take Statement

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

2.9.1. Amount or Extent of Take

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

NMFS anticipates that the take of juvenile CCC steelhead associated with the construction of a new bridge over Frasier Creek in Sonoma County, California will be in the form of harm, injury, or mortality caused by dewatering, fish relocation, bank stabilization, and increased turbidity levels over a period of four months.

The precise number of CCC steelhead that are likely to be taken by the project cannot always be accurately quantified because steelhead: (1) are relatively small (especially as eggs, alevins, and juveniles); and (2) live in aquatic environments where visibility is often low, hiding cover is often available, and predators feed. In cases where NMFS cannot specify a quantity of individuals that are expected to be incidentally taken by the action, incidental take must be quantified using a surrogate as an extent. Thus, NMFS has used the maximum percentage of three percent-expected injury or mortality of listed CC steelhead to be incidentally taken.

Take of listed juvenile and CCC steelhead may occur during fish relocation and dewatering in a maximum of 100 linear foot reach at the project site between June 15 and October 1. The number of CCC steelhead that may be incidentally taken during dewatering activities is expected to be small, and limited to the pre-smolt and young-of-year juvenile life stage. NMFS expects that no more than 3 percent of juvenile steelhead within the maximum of 100 linear foot dewatering area of Frasier Creek will be injured, harmed, or killed during fish relocation and dewatering activities. If more than 3 percent of the total number juvenile steelhead captured are harmed or killed, incidental take will have been exceeded.

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 CCC steelhead, or destruction or adverse modification of their critical habitat.

2.9.3. Reasonable and Prudent Measures

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

NMFS believes the following reasonable and prudent measures (RPM) are necessary and appropriate to minimize take of CCC steelhead:

> (1) Undertake measures to ensure that harm and mortality to listed steelhead resulting from fish relocation and dewatering activities is low.
>
> (2) Undertake measures to minimize harm to CCC steelhead resulting during and from construction of the Project.

(3) Undertake measures to monitor the performance of the Project's post-construction revegetation performance.

(4) Prepare and submit reports that summarize the effects of construction, fish relocation, and dewatering activities, and post-construction site performance.

2.9.4. Terms and Conditions

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

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

    a. At least 60 days prior to the initiation of construction, a stream dewatering plan and a fish relocation plan shall be provided to NMFS for review and approval.

    b. Captured fish shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish shall not be removed from this water except when released. To avoid predation, the biologist shall have at least two containers and segregate young-of-year fish from larger age classes and other potential aquatic predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which habitat condition are present to allow for adequate survival of transported fish and fish already present.

    c. If any salmonids are found dead or injured, the biologist shall contact NMFS biologist Andrew Trent by phone immediately at (707) 578-8553 or the NMFS North-Central Coast Office at (707) 575-6050. The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All salmonid mortalities shall be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location of collection, fork length measured, and frozen as soon as possible. Frozen samples shall be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS North-Central Coast Office without obtaining prior written approval from NMFS. Any such transfer will be subject to such conditions as NMFS deems appropriate.

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

    a. Construction equipment used within the creek channel will be checked each day prior to work within the creek 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 (top of bank to top of bank), Caltrans, the County of Sonoma or their contractor will

contain the spill and remove the affected sediment.

b. In areas where concrete is used, a dry work area must be maintained to prevent conveyance of runoff from curing concrete to the surface waters of the adjacent stream at all times. Water that inadvertently contacts uncured concrete must not be discharged into surface waters.

c. Once construction is completed, all Project-introduced material (pipe, cofferdam, *etc*.) must be removed. Excess materials will be disposed of at an appropriate disposal site. All cofferdams, pumps, pipes and other diversion materials will be removed from the stream upon work completion and no later than October 15.

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

a. At least 60 days prior to the initiation of construction, the County of Sonoma and Caltrans shall provide a plan to NMFS for review and approval regarding monitoring the success of the riparian vegetation.

4. The following terms and conditions implement reasonable and prudent measure 4:

a. Caltrans or the County of Sonoma must provide a written report to NMFS by January 31 of the year following construction of the proposed action. The report must be provided to NMFS North-Central Coast Office, Attention: North Coast Branch Chief, 777 Sonoma Avenue, Room 325, Santa Rosa, California, 95404-6528. The report must contain, at a minimum, the following information:

i. Construction Related Activities – The report must include the dates construction began and was completed, a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, a description of any and all measures taken to minimize those unanticipated effects and a statement as to whether or not the unanticipated effects had any effect on ESA-listed fish, the number of salmonids killed or injured during the Project action, and photographs taken before, during, and after the activity from photo reference points.

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

2.10. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered

species. Specifically, "conservation recommendations" are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). NMFS has no conservation recommendations for this Project on Frasier Creek in Sonoma County, California.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Geysers Road over Frasier Creek Bridge Replacement Project.

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

2.12. "Not Likely to Adversely Affect" Determinations

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

NMFS does not anticipate the proposed action will adversely affect:

Central California Coast (CCC) coho salmon ESU (*O. kisutch*)
Endangered (70 FR 37160; June 28, 2005)
Critical habitat (64 FR 24049; May 5, 1999);

California Coastal (CC) Chinook salmon ESU (*O. tshawytscha*)
Threatened (June 28, 2005; 70 FR 37160).

CCC coho salmon have never been observed in the action area, and though historically may have occasionally been observed in the upper river portion of the Russian River, they have not been observed in several decades, and are currently thought to occupy the Russian River watershed only in the watershed below Healdsburg, California. CC Chinook salmon are found in the upper Russian River mainstem and lower gradient tributaries, but have not been found in the action area, and would have migrated downstream to the ocean prior to the timing of project operations. Thus, these ESA-listed salmonids are unlikely to be present in the action area during the project's in-water construction activities and the effects of the project's activities are anticipated to be discountable.

Critical habitat has not been designated in the action area for CC Chinook and the action area does not contain PBFs considered essential for the conservation of CCC Coho salmon. Therefore, the potential effects of the project are not expected to result in either a net change to existing habitat values or adverse impacts to designated critical habitat for CC Chinook or CCC coho salmon.

3. 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.

3.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this opinion is Caltrans. Other interested users may include Sonoma County DTPW. Individual copies of this opinion were provided to the Caltrans. The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adhere to conventional standards for style.

3.2. 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.

3.3. Objectivity

Information Product Category: Natural Resource Plan

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

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

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