UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

Refer to NMFS No: WCRO-2020-01702

October 14, 2020

Ryan T. Larson
Levees and Channels Branch Chief
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the McClaren Drive Bank Protection Project

Dear Mr. Larson:

Thank you for your letter of April 20, 2020, 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 McClaren Drive Bank Protection Project. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR Part 402 as amended; 84 Fed. Reg. 44976, 45016 (August 27, 2019).

NMFS also reviewed the likely effects of the proposed action on essential fish habitat (EFH), pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), and concluded that the action would adversely affect the EFH of Pacific Coast Salmon. Therefore, we have included the results of that review in Section 3 of this document.

Based on the best available scientific and commercial information, the biological opinion concludes that the proposed Project is not likely to jeopardize the continued existence of the federally listed as threatened California Central Valley steelhead distinct population segment (*Oncorhynchus mykiss*), and is not likely to destroy or adversely modify its designated critical habitat. NMFS has included an incidental take statement with reasonable and prudent measures and non-discretionary terms and conditions that are necessary and appropriate to avoid, minimize, or monitor incidental take of listed species associated with the Project.

Please contact Elizabeth Keller at the California Central Valley Office of NMFS at (916) 930-3606 or via email at elizabeth.keller@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

A. Catherine Marcinkevage

Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

Enclosure

cc: Copy to the AR File No: 151422-WCR2020-SA00006

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

McClaren Drive Bank Protection Project

NMFS Consultation Number: WCRO-2020-01702

Action Agency: U.S. Army Corps of Engineers (USACE)

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?
California Central Valley steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	No

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes

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

Issued By: A. Catherine Marcinkevage

Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

Date: October 14, 2020

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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

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 *et seq*.), and implementing regulations at 50 CFR 402, as amended.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 *et seq*.) and implementing regulations at 50 CFR 600 .

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

1.2. Consultation History

- On February 12, 2020, NMFS received a letter and Biological Assessment (BA) from U.S. Army Corps of Engineers (USACE) requesting concurrence with the determination that the McClaren Drive Bank Protection Project (Project) is not likely to adversely affect listed species and designated critical habitat.

- On February 19, 2020, NMFS and USACE communicated via phone to address NMFS's questions and needed information about the project.

- On February 25, 2020, NMFS and USACE had a call to discuss project information and determinations, including that NMFS does not concur with the determination that the project is not likely to adversely affect (NLAA) steelhead critical habitat, due to impact to critical habitat. It was agreed the consultation would be re-requested as a formal consultation.

- On March 3, 2020, NMFS sent a letter to USACE notifying that the informal consultation request was considered withdrawn.

- On April 20, 2020, NMFS received a consultation request letter from USACE requesting formal consultation on the Project.

- On April 30, 2020, NMFS requested additional Project information regarding the area of Flexamat and plantings, the expected growth of vegetation through the Flexamat, and monitoring details.

- During May and June 2020, NMFS, USACE, and consultants on the Project engaged in multiple calls and emails to discuss project details and additional information needed.

- On June 25, 2020, NMFS received a BA addendum with additional project description.

- On June 26, 2020, NMFS received sufficient information, and formal consultation was initiated.

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).

Gunite bank protection (sprayed concrete), installed in the early 1960s on the western bank of the Lower American River near RM 13.8, is currently failing. This gunite extends approximately 250 linear feet along the bank line of two private residential properties and vertically from the toe of the slope below the low summer water levels to the top of the river bank. The bank at the project site is steep, and there is evidence of erosion behind the gunite wall. The existing bank consists of fracturing gunite with small amounts of primarily non-native vegetation and no functional riparian habitat. The homeowners of the private residential properties propose to remove the existing gunite bank protection and replace it with a new bank protection structure of predominantly Flexamat (defined below) combined with rock slope protection (RSP) at the toe of the slope. The private citizen homeowners have applied for a Section 404 permit through the USACE.

Removal of existing gunite

The existing gunite structure would be demolished, removed, and disposed of over the course of 5–7 days. An excavator with demolition attachment (*e.g.*, hydraulic hammer), skid-steer loader, front-end loader, and haul trucks would be used. Approximately 115 tons of existing gunite bank protection and concrete covering 0.11 acre would be demolished and hauled to the nearest disposal site. Before Flexamat placement, the subgrade would be prepared to ensure it is smooth and free of all rocks, sticks, roots, other protrusions, and debris of any kind. No trees that provide shaded riverine aquatic (SRA) habitat will be removed.

Flexamat installation

Flexamat is a permanent erosion control mat utilized to stabilize levee slopes, channels, low water crossings, inlets/outlets, and shorelines. Flexamat consists of 6.5-inch square concrete blocks (with a 2.25-inch profile) locked together and embedded into a high-strength geogrid. There are 1.5-inch spaces between the blocks to provide flexibility and allow vegetation growth. Approximately 77 percent of the total area of Flexamat consists of concrete blocks, whereas 23 percent of the area are geogrid gaps between concrete, which allow for vegetation to grow

through. A total of 0.11 acre of Flexamat would be installed below the ordinary high water mark (OHWM). The project would require approximately 11,400 square feet of Flexamat rolls.

After the slope is cleared and graded, Flexamat would be laid over the slope. Flexamat would be installed on the slope in approximately 15-foot-wide rolls with an 18-inch geogrid extension. Installation would involve embedding 24 inches of matting along the upper slope edge and upstream/downstream sides. The termination trench where matting is embedded would be filled and compacted with cohesive soil or concrete. Cross-plate percussion anchors would be used to secure the Flexamat. Overlap seams between sections of Flexamat would be secured in 2-inch increments using cross-plate percussion anchors penetrating the upstream mat and geogrid extension from adjacent downstream mat. Cross-plate percussion anchors would also be installed in 2-inch increments along the upstream edge of armor.

Rock placement

The project would require approximately 150 cubic yards (approximately 300 tons) of rock for toe protection. To secure the toe, launch-able rock would be placed between the existing in-channel concrete anchor block and along the slope, up to 6 feet from the existing ground surface. RSP will be installed on top of the Flexamat at the levee toe. Approximately 0.04 acre of RSP will be installed below OHWM. If necessary to accommodate the angular launch-able rock, the anchor block would be pushed up to 2 to 3 feet away from the bank with a long excavator extension.

All heavy equipment, including the excavator, would remain on the bank throughout construction activities and would not enter the water, with the potential exception of the excavator bucket to move the anchor block (if necessary). Manual laborers would work in the water for 3 to 5 days during Flexamat and/or rock revetment placement. Before moving the anchor block or placing materials in the wetted portion of the channel, a silt curtain would be installed to minimize potential turbidity impacts.

Vegetation planting

After Flexamat installation, pole cuttings of native shrubby species would be installed near the mid to lower slope; potential species to be planted include sandbar willow *(Salix exigua),* common buttonbush *(Cephalanthus occidentalis),* and mulefat *(Baccharis salicifolia).* Native grass plugs, such as creeping wild rye *(Leymus triticoides)*, would be established within the spaces between Flexamat blocks.

The Project would include the planting of native willow (*Salix* spp.) poles into the Flexamat at both vertical and lateral intervals approximately 2-3 feet apart. The plantings would be vertically staggered to maximize coverage, growth, survival ability and habitat attributes. Willow plantings would span from an upper Water Surface Elevation (WSE) of 42 feet down to 38 feet. The plantings would include a row of tules (*Schoenoplectus acutus*) planted at approximately 1-foot intervals for the length of the Project, located at a WSE of 37 feet (approximately 1 foot below the last willow plantings). Depending upon the WSE at the time of construction, tules may need to be planted at a later date. Any such variances would be included in the post-construction report and coordinated with NMFS prior to a decision being made.

Site Monitoring

Following completion of construction, an initial report would be submitted to NMFS and USACE within 30 days. The report would include representative site photos showing the placement of Flexamat and plantings, as well as a final count of willows.

The site would be monitored for a total of three years following the completion of construction (*i.e.*, 2021-2023). Site monitoring would occur within 1 month of the Project completion date each year with a subsequent report submitted to NMFS and USACE within 30 days of the monitoring event. Monitoring would include a survival count for the willows along with site photos. If survival of willows is below 80 percent of the previous year's count, in any given year additional willow poles would be planted to achieve the target of 80 percent. If willow plantings are consistently not surviving in a particular location, NMFS and USACE would be notified and consulted with to determine a course of action and to recommend alternative plantings and/or locations within the Project footprint.

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

We considered, under the ESA, whether or not the proposed action would cause any other activities that would have consequences on listed species or its critical habitat and determined that it would not. 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.

1.4. Proposed Avoidance and Minimization Measures

The following are Best Management Practices (BMPs) proposed to minimize overall impacts associated with the proposed action:

- Turbidity reduction measures would be put in place.
    - All local, State, and Federal regulations and environmental requirements regarding turbidity reduction measures would be complied with, including measures specified in the Streambed Alteration Agreement, Clean Water Act (CWA) Section 401 Water Quality Certification, and CWA Section 404 permit.

    - A silt curtain would be installed and maintained around the in-water construction area to minimize turbidity to surrounding areas until in-water activities are complete. A qualified biologist would be present during silt curtain installation. If any special-status fish are observed in the action area, installation would be halted until they have voluntarily left the area.

- Construction materials
    - Conduct all work according to site-specific construction plans that minimize the area of ground disturbance and restrict stockpiling of construction materials, including portable equipment and supplies, to the designated area.

    - All litter, debris, unused materials, equipment, and supplies would be removed daily from any areas below the OHWM and stored in a designated area.

- Stockpiles would be stabilized and protected from exposure to erosion.

- Contaminants
  - A Spill Prevention Containment and Countermeasures Plan (SPCCP) would be developed and implemented that includes appropriate hazardous materials handling, storage, and spill response practices, including on-site handling rules of construction and maintenance materials.

  - All refueling and servicing of equipment would be conducted in a designated area away from the river and with absorbent material or drip pans underneath to contain spilled fuel. Any fluid drained from machinery during servicing would be collected in leak-proof containers and delivered to an appropriate disposal or recycling facility.

  - Biodegradable hydraulic fluid would be used in all machines that have the potential to come in contact with surface waters.

  - Spill cleanup equipment would be maintained in proper working condition, and absorbent booms would be kept onsite to prevent petroleum products from entering the river in the event of a spill or leak.

  - In the event of a spill, the spill would be cleaned up and NMFS, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife, and Central Valley Regional Water Quality Control Board would be notified immediately (within 24 hours) of any spills and cleanup procedures.

- A worker awareness training program would be conducted for construction personnel before the start of construction activities and as needed when new personnel begin work on the project. The program will include a brief overview of sensitive fisheries and aquatic resources in the action area, measures to minimize impacts on those resources, and conditions of relevant regulatory permits.

- In-water construction activities would be restricted to months when special-status fish species/sensitive life stages are least likely to be present (e.g., July 1 to October 31).

- No trees would be removed.

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 incidental take statement (ITS) that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

This biological opinion includes both a jeopardy analysis and 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 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 of critical habitat for CCV steelhead uses 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 44976, 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.

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. See Table 1 for species and critical habitat information.

Table 1. Description of species, critical habitat, current ESA listing classification, summary of species and habitat status.

Species Name	Current Final Listing Status	Status Summary	Critical Habitat Designated	Critical Habitat Status Summary
California Central Valley Steelhead	1/5/2006 71 FR 834 Threatened	According to the NMFS 5-year species status review (NMFS 2016), the status of CCV steelhead appears to have remained unchanged since the 2011 status review that concluded that the Distinct Population Segment (DPS) was in danger of becoming endangered. Most natural-origin CCV populations are very small, are not monitored, and may lack the resiliency to persist for protracted periods if subjected to additional stressors, particularly widespread stressors such as climate change. The genetic diversity of CCV steelhead has likely been impacted by low population sizes and high numbers of hatchery fish relative to natural-origin fish. The life-history diversity of the DPS is mostly unknown, as very few studies have been published on traits such as age structure, size at age, or growth rates in CCV steelhead. CCV steelhead is likely to become endangered within the foreseeable future through all or a significant portion of its range.	9/2/2005 70 FR 52488	Critical habitat for CCV steelhead includes stream reaches of the Feather, Yuba, and American rivers, Big Chico, Butte, Deer, Mill, Battle, Antelope, and Clear creeks, the Sacramento River, as well as portions of the northern Delta. Critical habitat includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high-water line. In areas where the ordinary high-water line has not been defined, the lateral extent will be defined by the bankfull elevation. Physical and biological features (PBFs) considered essential to the conservation of the species include: spawning habitat; freshwater rearing habitat; freshwater migration corridors; and estuarine areas. Many of the PBFs of CCV steelhead critical habitat are currently degraded and provide limited high quality habitat. Although the current conditions of PBFs for CCV steelhead critical habitat in the Central Valley are significantly limited and degraded, the habitat remaining is considered highly valuable.

2.2.1. Global Climate Change

One major factor affecting the rangewide status of the threatened and endangered anadromous fish in the Central Valley and aquatic habitat at large is climate change. Warmer temperatures associated with climate change reduce snowpack and alter the seasonality and volume of seasonal hydrograph patterns (Cohen *et al.* 2000) Central California has shown trends toward warmer winters since the 1940s (Dettinger and Cayan 1995). Projected warming is expected to affect CCV steelhead because fish are restricted to low elevations as a result of impassable rim dams.

CCV steelhead are blocked from the vast majority of their historic spawning and rearing habitat and may be particularly sensitive to temperature increases in these habitats, because juvenile CCV steelhead need to rear in the stream for one to two summers prior to emigrating as smolts. In the Central Valley, summer and fall temperatures below the dams in many streams already exceed the recommended temperatures for optimal growth of juvenile CCV steelhead, which range from 14°C to 19°C (57°F to 66°F).

In summary, observed and predicted climate change effects are generally detrimental to the species (McClure 2011, Wade *et al.* 2013), so unless offset by improvements in other factors, the status of the species and critical habitat is likely to decline over time. The climate change projections referenced above cover the time period between the present and approximately 2100. While there is uncertainty associated with projections, which increases over time, the direction of change is relatively certain (McClure *et al.* 2013).

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 Project site is on the north bank, at approximately river mile (RM) 13.4, of the lower American River in Sacramento County, California. The action area encompasses an approximately 0.32-acre area of the Lower American River and adjacent land on the north bank of the river (Figure 1). The project footprint is approximately 0.26 acre. The additional acreage of the action area beyond the footprint accounts for the silt curtain that would be installed around the project. The silt curtain is expected to reduce turbidity, but would not completely eliminate it. Therefore, an additional 100 feet downstream is included to define the action area to account for turbidity increases. The action area is immediately upstream (less than 0.2 mile) of where the levee begins on the north side of the river.

Figure 1. Aerial photograph of the Action Area from the Biological Assessment prepared by GEI Consultants, Inc. The NMFS-defined action area includes this area, as well as 100 feet downstream (indicated as south).

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 Listed Species and Critical Habitat in the Action Area

The action area, which includes a portion of the American River and associated bank and riparian area at and adjacent to the Project work area, functions as spawning, rearing, and migratory habitat for CCV steelhead. Adult CCV steelhead migration in the action are occurs from November to April. Spawning occurs from December through April. Juvenile rearing occurs throughout the year. Fish abundance in the action area is at its lowest between the months of July and October.

The in-water work location is located in designated critical habitat for CCV steelhead. Designated critical habitat for CCV steelhead in the American River extends from the American River's confluence with the Sacramento River, up to the base of the Folsom Dam. The Physical or Biological Features (PBFs) of CCV steelhead designated critical habitat within the action area include freshwater spawning habitat, freshwater rearing habitat and freshwater migration corridors. All three of these PBFs have been degraded from their historical condition due to human activity on and near the American River. The construction of Nimbus and Folsom dams has restricted access to historical spawning and rearing habitat for both species. Degradation of these PBFs has contributed to significant population declines within the American River. Drought conditions have also had detrimental effects to PBFs through reduced flows and increased water temperatures. These effects have led to reduced quality of spawning and rearing habitat and has likely limited migration corridors in summer months due to thermal barriers.

Spawning adults, holding post-spawn adults, and rearing juveniles may utilize the action area. CCV steelhead are known to spawn consistently in the Lower American River and naturally spawning fish are primarily hatchery-produced (Lindley *et al.* 2007). Although Hannon (2013) observed some returning adults with adipose fins (indicating wild origin) in the Lower American River, the in-river population is thought to be composed entirely of individuals raised in Nimbus Hatchery or their descendants (NMFS 2009). Juveniles are known to rear in the Lower American River throughout the year. In river-wide surveys conducted throughout the Lower American River, juvenile CCV steelhead have been observed exclusively in riffle and fast water habitat areas (U.S. Bureau of Reclamation 2015).

The "Recovery Plan for the Evolutionary Significant Units of Sacramento River winter-run Chinook salmon and Central Valley spring-run Chinook salmon and the Distinct Population Segment (DPS) of California Central Valley steelhead" (NMFS 2014, herein referred to as "Recovery Plan") provides a watershed profile for the American River, in the Northern Sierra Nevada Diversity Group. The Recovery Plan identifies the American River below Nimbus as a Core 2 watershed with a "High" risk of extinction. Core 2 populations provide increased life

history diversity to the DPS and are likely to provide a buffering effect against local catastrophic occurrences that could affect other nearby populations.

2.4.2. Factors Affecting Listed Species and Critical Habitat in the Action Area

The Lower American River has been degraded from its historic condition and many anthropomorphic and naturally occurring factors have led to the decline of anadromous fish in the system. Due to the construction of Nimbus and Folsom dams, flows and temperatures in the action area have been altered from their natural and historic regimes. Altered flow regimes can influence migratory cues, water quality (including contaminants, dissolved oxygen and nutrients for primary productivity) and temperature.

Construction of the dams has also restricted access to historic spawning and rearing habitat, leading to the decline of anadromous fish abundance in the Lower American River. Dams also block passage to spawning areas that are of greater intrinsic value, so all populations natal to the American River are currently forced to complete any natural spawning at a lower elevation than they otherwise would have, below Folsom Dam. Spawning in sub-par areas can involve higher than optimal water temperatures, degraded water quality due to anthropogenic pollution, and decreased water flow and velocity needs to oxygenate the developing eggs. Dams also retain the sediments that would normally re-supply spawning beds with appropriately sized gravel. Current spawning beds are losing suitable gravel due to the natural erosion and riverine transport while not being replenished, therefore diminishing in total area over time. Spawning site, rearing site and migration corridor PBFs have been degraded as a result of dam construction.

Drought conditions, exacerbated by climate change, have played a significant role in recent years, as flows have decreased and temperatures have increased, leading to unfavorable environmental conditions in the river. This has resulted in short term and long term impacts to listed fish as well as impacts to critical habitat. Heat stress, heat shock and disruption of migration due to thermal barriers have resulted from decreased flows in the river. Increased temperatures also have the potential to disrupt aquatic macroinvertebrate production, leading to declines in food availability (Ward and Stanford 1982).

It is likely that the in-river population of CCV steelhead is composed entirely of individuals raised in Nimbus Hatchery or their descendants (NMFS 2009, 2011). Hatchery production in recent years has been responsible for sustaining the CCV steelhead population in the American River, though there are likely hatchery-related genetic effects that have occurred within the population. Early broodstock used at Nimbus Hatchery contained steelhead from many different populations and geographic regions. There is also some concern that rainbow trout were introduced to the in-river population. Garza and Pearse (2008), using highly variable microsatellite markers from adults returning to the hatchery, identified over one third of the fish as hatchery rainbow trout. Reduced wild population size and altered selection regimes have likely led to the current genetic assemblage of CCV steelhead in the Lower American River (Waples 1991).

The areas surrounding the Lower American River have been heavily urbanized. This has likely increased the amount of contaminant loading in the aquatic ecosystem. Heavy metals, Polycyclic Aromatic Hydrocarbons, petroleum products, plastics, fertilizer and many other contaminants

can enter the river via urban runoff. Shoreline areas along the Lower American River have also been highly developed over time, including artificially created levees. Levees and other shore-side development substantially reduce density and diversity of riparian vegetation and lead to decreased recruitment of large woody material (LWM), resulting in a loss of habitat complexity which is a critical component of the freshwater rearing site PBF.

One such levee project is the American River Common Features Project, which was consulted on with NMFS in 2015. Construction will occur from 2021-2024. The project will involve construction of bank protection and/or launchable rock trenches on the North and South Levees from the confluence with the Sacramento River upstream for approximately 12 miles during 2021–2024. This will impact an estimated total of 45,367 linear feet of impacts to shaded riparian aquatic habitat along the American River.

Riparian vegetation provides a host of ecosystem services and its removal has diminished habitat value within the action area. Riparian vegetation plays a key role in the value of rearing habitat for conservation of all salmonid life stages by providing shade to lower stream temperatures, increasing the recruitment of large woody material into the river, increasing habitat complexity, providing shelter from predators and enhancing the productivity of aquatic macroinvertebrates (Anderson and Sedell, 1979; Pusey and Arthington, 2003). It has also been shown to directly influence channel morphology and may be directly correlated with improved water quality in aquatic systems (Dosskey *et al*., 2010; Schlosser and Karr, 1981).

The American River also hosts water sports and recreation, such as swimming and boating. While largely harmless to listed fish in individual occurrences, such activities can cumulatively approach worrisome levels during hot days and on weekends when many members of the public seek relief from high daytime temperatures. Fishes may avoid areas that experience high watersport use due to underwater noise created by boat motors, music, and splashing. These activities can also create temporary sediment plumes in high traffic wading and swimming areas, which may deter fish or affect them at sub-lethal physiological levels. Human use of rivers typically leads to introduced materials like forgotten refuse, and petroleum products may enter the river through engine oil or fuel leaks.

Importance of the Action Area to the Survival and Recovery of Listed Species

The Lower American River contains spawning and rearing habitat for CCV steelhead. The portion of the Lower American River within the Action Area is designated critical habitat for CCV steelhead and contains spawning sites, rearing habitat, and migration corridor for CCV steelhead. Based on the current status, range and estimated abundance of CCV steelhead, the Action Area is an important portion of the Lower American River. Due to the presence of Nimbus Dam, spawning habitat for CCV steelhead is confined to those areas below the dam. The current in river population depends on spawning areas in and near the Action Area.

Rearing habitat within the Action Area contains important PBFs for the CCV steelhead population. Juveniles rear in the Action Area primarily in the winter and spring but may be present year-round. For this reason, the flow and temperature regimes in the river can potentially have important implications for juvenile recruitment. Habitat complexity and food availability

are also important components within the Action Area as they facilitate juvenile rearing and growth.

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).

2.5.1. Effects of the Proposed Action to CCV Steelhead

Increased Sedimentation and Turbidity

Increased sedimentation and turbidity may result from the proposed Project. In the action area, silt and sand on the river bottom would be disturbed during placement of new materials. Activities including site clearing, earthwork, planting, and construction would result in disturbance of soil and riverbed sediments and therefore temporary increases in turbidity and suspended sediments. Disturbance of sediments could lead to a degradation of water quality.

Increased sedimentation and turbidity could have short term and long term adverse physiological and behavioral effects to fish. High concentrations of suspended sediment can clog or abrade gill surfaces, disrupt normal feeding behavior, reduce feeding efficiency, and decrease food availability, reduce predator avoidance, or result in avoidance or displacement of fish from preferred habitat (Cordone and Kelley 1961, Phillips and Campbell 1961, Newcombe and Jensen 1996, Kemp *et al.* 2011). Salmonids have been observed to move laterally or downstream to avoid turbidity plumes (Sigler *et al.* 1984). Temporary spikes in suspended sediment may result in behavioral avoidance of the site by fish; several studies have documented active avoidance of turbid areas by juvenile and adult salmonids (e.g., Sigler *et al.* 1984, Lloyd 1987, Servizi and Martens 1992). Juvenile salmonids are unlikely to avoid increased levels of turbidity below a level of 70 nephelometric turbidity units (NTU) (Bash *et al.* 2001). As a result, they may be at greater risk to turbidity and sediment-related effects than adults. Chronic exposure to high turbidity and suspended sediment may also affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Berg and Northcote 1985, Servizi and Martens 1992, Waters 1995).

Any increase in turbidity associated with proposed instream work is likely to be brief and localized, attenuating downstream as suspended sediment settles out of the water column. Potential effects of increased sedimentation and turbidity would be minimized through implementation of proposed BMPs including turbidity reduction measures, such as silt fencing, as well as stipulations included in the CWA Section 401 Water Quality Certification. All in-water work would be conducted between June 1 and October 31 to minimize exposure to fish and avoid exposure to redds or eggs. Although there is potential for impacts to adult and juvenile fish due to temporary, localized plumes of turbidity during these processes, BMPs would

minimize the extent of sedimentation and turbidity effects caused by the proposed action and, therefore, impacts to listed fish are expected to be minimal and temporary.

Contaminants and Pollution-Related Effects

The proposed action would involve construction equipment and activities that could impair water quality if a spill were to occur. Potential sources of pollutants include fuel, lubricants, and hydraulic fluid. A spill or discharge could result in the introduction of heavy metals, nutrients, hydrocarbons, or synthetic compounds, which may cause increased temperatures, disease susceptibility, or algal blooming. Potential pollution-related effects have the potential to be persistent in the action area and may affect multiple life stages, if they were to occur.

High concentrations of contaminants can cause adverse effects to fish. Effects include mortality from exposure, reduced oxygen availability, or increased susceptibility to disease that reduces the overall health and survival of the exposed fish. The severity of these effects depends on the contaminant, the concentration, duration of exposure, and sensitivity of the affected life stage. A potential indirect effect of contamination is reduced prey availability (invertebrate prey survival could be reduced following exposure), making food less available for fish. Fish consuming affected prey may also absorb toxins indirectly.

For CCV steelhead, potential adverse effects of reduced water quality during Project construction would be minimized with proposed BMPs and implementation of a SPCCP, which would minimize the probability of pollutant incursion into the American River. With the proposed BMPs being utilized, impacts to adult or juvenile CCV steelhead from contaminants are not expected to occur.

Construction disturbance

Construction has the potential to introduce noise, vibration, and other physical disturbances into the immediate environment that can result in the harassment of fish by disrupting or delaying their normal behaviors and use of areas, or less likely, causing injury or mortality. Noise, vibration, and in-water disturbance associated with construction activities could cause fish present to move away and avoid the area, causing a disruption to their normal feeding or other behaviors. Displacement may temporarily expose juvenile fish to a greater risk of predation Injury or mortality could potentially occur if listed fish are present in the in-water work area and are contacted by the excavator. The excavator bucket would be the only heavy equipment that would enter the water. General construction-related effects may also include debris falling into the active channel, tools and/or equipment falling into the active channel. Adults and juveniles could potentially encounter equipment being used or objects being placed in the water. Such instances could cause physical injury or death, or acute avoidance of equipment would be an alteration of their normal behaviors and induce physiological stress.

Construction activity will be limited to the work window of July 1 to October 31. This work window somewhat decreases the probability that listed fish will be exposed, due to the seasonal timing of their life history patterns. Even so, there remains a possibility that both adult and juvenile CCV steelhead may occur in this action area and be adversely affected by construction. While an accidental catastrophe may cause direct injury or mortality (*e.g.*, heavy equipment

falling into the water), it is far more likely that equipment operation, general construction noises, and human presence may disturb or alter the behavior of listed fishes, such as migratory patterns or result in displacement.

Best management practices, avoidance, and minimization techniques would be implemented to the extent feasible to minimize the probability of construction-related effects in the action area. After installation, the silt curtain would limit some fish from entering the work area from outside the work area. Any juvenile fish trapped within the curtain during installation could suffer direct injury or mortality from general construction activity.

2.5.2. Effects of the Proposed Action to Critical Habitat

Degradation of River Habitat

The addition of 0.11 acres of Flexamat and 0.04 acres of RSP along the American River would impact the bank and the associated nearshore habitat. Flexamat and RSP would degrade the quality of shoreline habitat due to installation of permanent concrete blocks, which reduce physical complexity. Installation of concrete and RSP would prevent the bank from being restored to a fully natural riparian corridor or having natural river morphology. Loss of natural river morphology and function is the result of river channelization and confinement, which leads to a decrease in riverine habitat complexity, and thus, a decrease in the quantity and quality of juvenile rearing and migratory habitat PBFs.

Alteration of water quality

The action area contains spawning, rearing, and migratory habitat for CCV steelhead. There is potential for degradation of PBFs resulting from turbidity and sedimentation during the action. Kemp *et al.* (2011) describe a suite of physiochemical effects to lotic aquatic systems resulting from increased sedimentation and turbidity-related events. Sedimentation has the potential to increase turbidity on a broad temporal scale and reduce oxygen supply. These impacts could degrade the PBFs for CCV steelhead. BMPs and minimization and avoidance measures, such as groundcover and stabilization using silt fencing and fiber rolls, would be implemented during construction to minimize Project-disturbed soil on land from entering the water (see Section 1.4). Potential adverse effects to critical habitat PBFs for the species addressed in this biological opinion resulting from turbidity and sedimentation are not expected to occur at a scale in which critical habitat would be permanently impacted. With the minimization and avoidance measures included in the proposed action, turbidity and sedimentation are expected to result in minor and short-term effects to PBFs of designated critical habitat for CCV steelhead in the action area.

Riparian vegetation plantings

Riparian vegetation plays a key role in the value of rearing and migration habitat for the conservation of many salmonid life stages. It provides shading to reduce stream temperatures, increases the recruitment of large woody material into the river, increasing habitat complexity, provides shelter from predators, and enhances the productivity of aquatic macroinvertebrates (Anderson and Sedell 1979, Pusey and Arthington 2003). Riparian zones enhance water quality by reducing the input of fine sediments and pollutants into streams (Karr and Schlosser 1978, Lowrance *et al.* 1985). It has also been shown to directly influence channel morphology and may

be directly correlated with improved water quality in riverine systems through biogeochemical cycling, soil and channel chemistry, water movement, and erosion (Schlosser and Karr 1981, Dosskey *et al.* 2010).

The proposed action would affect the American River by permanently impacting bank and shoreline habitat with the addition of concrete and RSP, adversely impacting the spawning, rearing and, migratory corridor PBFs that support CCV steelhead. The bank stabilization design replaces gunite (100 percent cement bank) and utilizes Flexamat, which would allow for the establishment of some riparian plantings between the concrete blocks along the riverbank. Riparian vegetation would be planted within the 1.5-inch gaps between the 6.5-inch concrete blocks. This addition of riparian vegetation is expected to return some PBFs of migratory corridor and rearing habitat for CCV steelhead. Establishment of riparian trees and shrubs between the larger sections of concrete would stabilize the bank and decrease the risk of erosion or bank failure, would result in shade, which has the potential to decrease summer stream temperatures, increase water quality, increase available food sources and detritus associated with canopy cover, and improve growth and condition of juvenile salmonids (Anderson and Sedell 1979, NMFS 1997, Pusey and Arthington 2003, Windell *et al.* 2017). The use of a Flexamat design is expected to minimize the adverse impacts of bank protection, though due to the inclusion of concrete, the ability to support listed fish migrating or rearing along the bank is limited.

Retaining riparian habitat to support species is important to fish growth and survival, as indicated in the Recovery Plan (NMFS 2014), which outlines several recommended recovery actions for the Lower American River:

- Develop and Implement programs and projects that focus on retaining, restoring and creating river riparian corridors within their jurisdiction in the American River watershed.

- Utilize biotechnical techniques that integrate riparian restoration for riverbank stabilization instead of conventional rip rap in the American River.

Adding the ability for some spaced plantings would create more complex habitat and result in the site being closer to its natural and native condition than a bank protection design that does not include vegetation. However, establishment of riparian vegetation within the concrete structure of the Flexamat would result in permanent impacts, and would not be expected to provide all PBFs of rearing or migrating habitat.

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 in the environmental baseline (Section 2.4).

Increased Urbanization

Increases in urbanization and housing developments can impact habitat by altering watershed characteristics and changing both water use and stormwater runoff patterns. Increased growth will place additional burdens on resource allocations, including natural gas, electricity, and water, as well as on infrastructure such as wastewater sanitation plants, roads and highways, and public utilities. Some of these actions, particularly those that are situated away from waterbodies, will not require federal permits, and thus will not undergo review through the ESA section 7 consultation process with NMFS.

Increased urbanization also is expected to result in increased recreational activities in the action area. Among the activities expected to increase in volume and frequency is recreational boating. Boating activities typically result in increased wave action and propeller wash in waterways. This potentially will degrade riparian and wetland habitat by eroding channel banks and mid-channel islands, thereby causing an increase in siltation and turbidity. Wakes and propeller wash also churn up benthic sediments thereby potentially re-suspending contaminated sediments and degrading areas of submerged vegetation. This in turn will reduce habitat quality for the invertebrate forage base required for the survival of juvenile salmonids moving through the system. Increased recreational boat operation is anticipated to result in more contamination from the operation of gasoline and diesel powered engines on watercraft entering the associated water bodies.

Rock Revetment and Levee Repair Projects

Depending on the scope of the action, some non-federal riprap projects carried out by state or local agencies do not require federal permits. These types of actions and illegal placement of riprap occur within the Sacramento River watershed. The effects of such actions result in continued degradation, simplification and fragmentation of riparian and freshwater habitat.

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.

In our *Rangewide Status of the Species* section, NMFS summarized the current likelihood of extinction of CCV steelhead. We described the factors that have led to the current listing of CCV

steelhead under the ESA and across their range. These factors include past and present human activities and climatological trends and ocean conditions that have been identified as influential to the survival and recovery of the listed species. Beyond the continuation of the human activities affecting the species, we also expect that ocean condition cycles and climatic shifts will continue to have both positive and negative effects on the species' ability to survive and recover. The *Environmental Baseline* section reviewed the status of the species and the factors that are affecting their survival and recovery in the action area. The *Effects of the Action* section reviewed the exposure of the CCV steelhead and critical habitat to the proposed action. NMFS then evaluated the likely responses of individuals, populations, and impacts to critical habitat. The *Cumulative Effects* section described future activities within the action area that are reasonably certain to have a continued effect on federally listed fish.

In order to estimate the risk to CCV steelhead as a result of the proposed action, NMFS uses a hierarchical approach. The condition of the DPS is summarized in the *Status of the Species* section of this opinion. We then consider how the status of populations in the action area are affected by the proposed action, as described in the *Environmental Baseline* section. Effects on individuals are summarized, and the consequences of those effects are applied to establish risk to the DPS.

Status of the Species, Critical Habitat, and Environmental Baseline

Since the 2016 status review, the status of the CCV steelhead DPS appears to have remained unchanged and the DPS is likely to become endangered within the near future throughout all or a significant portion of its range (NMFS 2016). Many of the PBFs of CCV steelhead critical habitat are degraded and provide limited high-quality habitat. These spawning, rearing, and migratory corridor PBFs that support CCV steelhead would be adversely impacted through permanent installation of concrete and RSP to the riverbank and shoreline. These permanent impacts only represent a small loss in the scope of the available habitat for CCV steelhead, but the intrinsic value of the area for the conservation of fish remains high.

The evidence presented in the *Environmental Baseline* section indicates that past and present activities within the American River have caused significant habitat loss, degradation, and fragmentation. This has significantly reduced the quality and quantity of the remaining PBFs within the action area for the population of CCV steelhead that utilizes this area. Loss of habitat due to dams, alterations in flow regimes, removal of riparian vegetation, reduced habitat complexity, and construction of armored levees have also substantially reduced the functionality of the waterways.

Cumulative Effects

Urbanization and rock revetment and levee projects are reasonably expected to continue in the future in the action area. The effects of these actions result in the continued degradation, simplification, and fragmentation of the riparian and freshwater habitat. Some of these actions, particularly those that are situated away from waterbodies, would not require federal permits, and thus would not undergo review through the ESA section 7 consultation process with NMFS.

Summary of the Effects of the Proposed Action

CCV steelhead are expected to be harassed, injured, or killed during completion of the proposed action through various pathways. Effects from Project activities are expected to result in adverse effects through habitat loss and degradation, or prey items killed from sediment or pollutant buildup. Construction-related increases in sedimentation and siltation above background level are expected to affect fish species and their habitat, reducing survival of juveniles or interfering with feeding, migrating, and rearing activities. Fish trapped inside the silt curtain would suffer injury or mortality. Avoidance and minimization measures, as well as BMPs, would be implemented to minimize any adverse effects to listed species; however, these actions are expected to adversely affect CCV steelhead.

Critical habitat has been designated in the action area for CCV steelhead and PBFs affected for each species are described in section 2.5.2. The proposed action would temporarily and permanently affect the action area, which already contains degraded PBFs. Bank stabilization would impact the American River by permanently impacting bank and shoreline habitat with addition of concrete and RSP, adversely impacting the spawning, rearing and, migratory corridor PBFs that support CCV steelhead. The critical habitat that remains is considered to have high intrinsic value for conservation of the species. Therefore, the loss of any amount of these PBFs in the action area is expected to adversely affect CCV steelhead.

As discussed in Section 1.3 above, the proposed action includes riparian plantings to partially restore the bank, in between concrete. The planting and establishment of riparian vegetation are expected to provide PBFs of freshwater rearing and migratory corridor habitat for CCV steelhead. Over the long term, as vegetation is established, PBFs of riparian habitat is expected to support the growth and survival of rearing salmonids by providing habitat with cover, abundant food in the form of aquatic invertebrates, structural diversity, such as instream woody material, and cooler stream temperatures.

Effects to the DPS

According to the most recent status reviews (NMFS 2016), CCV steelhead are at risk of becoming endangered, due to past and present activities causing habitat loss, degradation and fragmentation.

The Recovery Plan (NMFS 2014) identifies the CCV steelhead population in the lower American River as a Core 2 population. A Core 2 population is characterized as meeting, or having the potential to meet, the biological recovery standard for moderate risk of extinction set out in the Recovery Plan. These populations provide increased life history diversity to the ESU/DPS and are likely to provide a buffering effect against local catastrophic occurrences that could affect other nearby populations, especially in geographic areas where the number of Core 1 populations is lowest. The recovery criteria for the Northern Sierra Nevada Diversity Group, which includes the American River, includes establishment four viable populations of CCV steelhead. Upstream of major dams in the American River is considered a candidate for reintroduction, which could satisfy one of the needed viable (Core 1) populations if successful.

Although the proposed Project is expected to result in long-term and short-term impacts to the DPS, the impacts are expected to be minor, with construction occurring during seasons when fish abundance is at a minimum. Planting riparian vegetation between blocks of concrete, and monitoring to ensure successful establishment of the vegetation, would support the lower American River population that could aid in recovery. Therefore, the proposed project is not expected to reduce appreciably the likelihood of both the survival and recovery of CCV steelhead in the wild, nor appreciably diminish the value of designated or proposed critical habitat for the conservation of the species.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of CCV steelhead DPS 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). "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 incidental take of juvenile CCV steelhead in the form of harassment, harm, or mortality. Increased sedimentation and turbidity is expected to cause fish avoidance of the work areas or induce detrimental sub-lethal effects. Additionally, adverse impacts to steelhead are expected as a result of installation of Flexamat, including concrete blocks, and RSP along the bank. These are expected to reduce the ability of the bank to provide the full habitat benefits of a natural riparian corridor, resulting in harm to listed species.

It is not practical to quantify or track the amount or number of individuals that are expected to be incidentally taken as a result of the proposed action, due to the variability associated with the response of CCV steelhead to the effects of the proposed action, annual variations in the timing

of spawning and migration, individual habitat use within the action area, and difficulty in observing injured or dead fish. However, it is possible to estimate the extent of incidental take by designating ecological surrogates, and it is practical to quantify and monitor the surrogates to determine the extent of incidental take that is occurring. The most appropriate thresholds for incidental take are ecological surrogates of area within the silt curtain and permanent habitat disturbance expected to occur due to installation of Flexamat and RSP.

1. Construction effects and increased turbidity within the silt curtain would adversely impact any fish trapped within the silt curtain (low numbers expected), resulting in incidental take in the form of harm, harassment, injury, or death. NMFS anticipates incidental take would be limited to the area within the silt curtain of 0.06 acres.

2. Flexamat concrete and RSP result in riparian habitat loss and prevent the bank from being restored to support fish, resulting in incidental take in the form of harm. Juvenile CCV steelhead response to the Project bank repair includes reduced growth and fitness. NMFS anticipates incidental take would be limited to the Project footprint of 0.11 acres of Flexamat and an overlapping 0.04 acres of RSP.

If the area within the silt curtain installed exceeds 0.06 acres by more than 10 percent, the anticipated incidental take levels described are exceeded, triggering the need to reinitiate consultation. If the area of Flexamat and RSP installed below the OHWM exceeds 0.11 acres by more than 10 percent, the anticipated incidental take levels described are also exceeded, triggering the need to reinitiate consultation.

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 non-discretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

1. Measures shall be taken by USACE and the permit applicant, including all employees contracted by the applicant to carry out the permitted work, to ensure the implementation of and adherence to best management practices and conservation measures.

2. Measures shall be taken by USACE and the permit applicant to minimize sedimentation events and turbidity plumes in the action areas and related adverse effects to listed species and their critical habitat.

3. Measures shall be taken by USACE and the permit applicant to monitor and report on Project activities and vegetation monitoring.

2.9.4. Terms and Conditions

The terms and conditions described below are non-discretionary, and the USACE or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The USACE or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

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

    a. USACE shall ensure that construction of the proposed action will occur during the identified in-water work window.

    b. USACE and the permit applicant shall take all reasonable precautions to prevent heavy machinery from entering the water, with the exception of the excavator bucket.

    c. The Corps shall include the above terms and conditions in the permit to be issued.

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

    a. USACE, the applicant, and their contractors shall remain in compliance with all site BMPs specified and all other permit conditions to minimize the introduction of sediment into waterways, including preventing, controlling, and abating water quality degradation from soil erosion, vehicles, stormwater, and wastewater.

    b. Best Management Practices for erosion control shall be implemented, and monitored to prevent sediment incursion into the active channel until the project is completed.

    c. Turbidity and settable solids shall be monitored according to water quality permits. If acceptable limits are exceeded, work shall be suspended until acceptable measured levels are achieved.

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

    a. A report shall include a summary description of in-water construction dates and activities, avoidance and minimization measures taken, and any revegetated areas on-site.

    b. Updates and reports required by these terms and conditions shall be submitted (preferably via email) by December 31 of each year during the construction and each of the three years of vegetation monitoring to:

Cathy Marcinkevage
Assistant Regional Administrator
Central Valley Office
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento California 95814
Email: ccvo.consultationrequests@noaa.gov and Phone: (916) 930-3600

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. USACE and the applicant should provide a NMFS-approved Worker Environmental Awareness Training Program for construction personnel to be conducted by a NMFS-approved biologist for all construction workers prior to the commencement of construction activities. The program shall provide workers with information on their responsibilities with regard to federally-listed fish, their critical habitat, an overview of the life-history of all the species, information on take prohibitions, protections under the ESA, and an explanation of terms and conditions identified in this biological opinion. Written documentation of the training should be submitted to NMFS within 30 days of the completion of training. Completion of this training is consistent with agency requirements set forth in section 7(a)(1).

2. USACE and the applicant should limit vegetation removal to the absolute minimum amount required for construction.

3. USACE should work cooperatively with other state and federal agencies, private landowners, governments, and local watershed groups to identify opportunities for cooperative analysis and funding to support salmonid habitat restoration projects within the Sacramento River Basin. Implementation of future restoration projects is consistent with agency requirements set forth in section 7(a)(1).

2.11. Reinitiation of Consultation

This concludes formal consultation for the McClaren Drive Bank Protection Project.

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 USACE 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

EFH designated under the Pacific Coast Salmon FMP may be affected by the proposed action. Additional species that utilize EFH designated under this FMP within the action area include fall-run/late fall-run Chinook salmon. Habitat Areas of Particular Concern (HAPCs) that may be either directly or indirectly adversely affected include (1) complex channels and floodplain habitats, (2) thermal refugia, (3) spawning habitat.

3.2. Adverse Effects on Essential Fish Habitat

Effects to the HAPCs listed in section 3.1 are discussed in context of effects to critical habitat PBFs as designated under the ESA in section 2.4.1. A list of adverse effects to EFH HAPCs is included in this EFH consultation. Affected HAPCs are indicated by number corresponding to the list in section 3.1:

1. Sedimentation and Turbidity
    - Reduced habitat complexity (1)
    - Degraded water quality (1, 2, 3)
    - Reduction in aquatic macroinvertebrate production (1)

2. Habitat loss/modification
    - Reduced shelter from predators (1, 2)
    - Reduction/change in aquatic macroinvertebrate production (1)
    - Reduced habitat complexity (1)

3.3. Essential Fish Habitat Conservation Recommendations

NMFS determined that the following conservation recommendations are necessary to avoid, minimize, mitigate, or otherwise offset the impact of the proposed action on EFH.

The following conservation recommendations are necessary to avoid, mitigate, or offset the impact of the Project on EFH:

1. USACE and applicant should protect existing, and wherever practicable, establish new riparian buffer zones wide enough to support shading, large woody debris input, leaf litter inputs, sediment and nutrient control, and bank stabilization functions.

2. USACE and applicant should revegetate areas adjacent to the river with native plant species, including shaded riverine aquatic cover vegetation.

3. USACE and applicant should recommend to contractors to use biodegradable lubricants and hydraulic fluid in construction machinery. The use of petroleum alternatives can greatly reduce the risk of contaminants from entering the aquatic ecosystem.

Fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in section 3.2, above, for Pacific Coast salmon.

3.4. Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, USACE must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative time frames for the Federal agency response. The response must include a description of the measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5. Supplemental Consultation

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

4. Data Quality Act Documentation and Pre-Dissemination Review

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

4.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the USACE. Other interested users could include permit applicant, citizens in the affected area, and others interested in the conservation of the affected CCV steelhead DPS. An individual copy of this opinion were provided to the USACE. 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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