UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region, California Central Valley Office
650 Capitol Mall, Suite 5-100
SACRAMENTO, CA 95814

Refer to NMFS ECO #: WCRO-2024-01106

December 9, 2024

Scott Rothenberg
NEPA Assignment Manager
California High Speed Rail Authority
770 L Street, Suite 620
Sacramento, California 95814

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Stockton Diamond Grade Separation Project.

Dear Mr. Rothenberg:

Thank you for your April 15, 2024, letter, 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 Stockton Diamond Grade Separation Project (Project). Thank you also for your request for essential fish habitat (EFH) consultation. NMFS reviewed the proposed action for potential effects on EFH pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. We have concluded that the action would adversely affect EFH designated under the Pacific Coast Salmon Fishery Management Plan (PFMC 2014), and we included EFH conservation recommendations in this document. Pursuant to U.S. Code (U.S.C.) Title 23 Section 327, and a Memorandum of Understanding (MOU) between the Federal Rail Administration (FRA) and the State of California, effective July 23, 2019, the California High-Speed Rail Authority is the federal lead agency for review of this Project under the National Environmental Policy Act and other federal environmental laws.

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, threatened California Central Valley (CCV) steelhead distinct population segment (DPS, *Oncorhynchus mykiss*), nor destroy or adversely modify its designated critical habitat. NMFS has included an incidental take statement with reasonable and prudent measures and terms and conditions that are necessary and appropriate to avoid, minimize, or monitor incidental take of listed species associated with the Project. NMFS also concurs with the California High-Speed Rail Authority that the proposed action is not likely to adversely affect the threatened southern DPS of North American green sturgeon (*Acipenser medirostris*) or its designated critical habitat. Our analysis for concurrence is in section 2.12 of the biological opinion.

Please contact Kathryn Swick, California Central Valley Office at (301) 427-7812 or via email at kathryn.swick@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 for
California Central Valley Office

cc: File to: ARN 151422-2023-SA0044

Enclosure

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

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

Stockton Diamond Grade Separation Project

NMFS Consultation ECO Number: WCRO-2024-01106

Action Agency: California High-Speed Rail Authority

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?
CCV steelhead DPS (*Oncorhynchus mykiss*)	Threatened	No	No	Yes	No
sDPS North American green sturgeon (*Acipenser medirostris*)	Threatened	No	No	No	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 for California Central Valley Office

Date: **December 9, 2024**

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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 U.S.C. 1531 *et seq*.), as amended, and implementing regulations at 50 CFR part 402.

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

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within 2 weeks at the NOAA Library Institutional Repository (https://repository.library.noaa.gov/welcome). A complete record of this consultation is on file at the Sacramento NMFS Office.

1.2. Consultation History

- On May 17, 2021, NMFS issued an ESA Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Stockton Diamond Grade Separation Project (Project), WCRO-2021-00423
- In early 2023, the California High-Speed Rail Authority (CHSRA, the action agency) informed NMFS about design changes to the culvert that would span Mormon Slough. NMFS and the San Joaquin Regional Rail Commission (SJRRC, the applicant) worked collaboratively to assess the impacts of these changes on NMFS trust resources. During the process, the Design Team developed a measure to require that the new, proposed trash grates be removed or modified should hydrologic connectivity occur.
- On May 2, 2023, NMFS provided technical assistance via email regarding the analysis of hydrologic requirements for fish passage.
- On June 27, 2023, CHSRA requested to reinitiate informal consultation with NMFS for the Project.
- On November 2, 2023, NMFS responded with a letter of nonoccurrence, stating that formal consultation is required for the project.
- On April 15, 2024, CHSRA requested formal consultation for the Project.
- On April 29, 2024, NMFS requested more information regarding the construction schedule and specific design criteria for the Project.
- On May 8, 2024, CHSRA responded to NMFS' request for more information.

- On May 15, 2024, NMFS requested more information regarding the back slope where the applicant would place riprap.
- On May 20, 2024, CHSRA responded to NMFS's request for more information. NMFS responded with conservation recommendations to the applicant.
- On July 9, 2024, the applicant agreed to implement some of NMFS' suggested conservation recommendations, and NMFS initiated formal consultation on that date.

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on May 6, 2024 (89 Fed. Reg. 24268). We are applying the updated regulations to this consultation. The 2024 regulatory changes, like those from 2019, were intended to improve and clarify the consultation process, and, with one exception from 2024 (offsetting reasonable and prudent measures), were not intended to result in changes to the Services' existing practice in implementing section 7(a)(2) of the Act. 89 Fed. Reg. at 24268; 84 Fed. Reg. at 45015. We have considered the prior rules and affirm that the substantive analysis and conclusions articulated in this biological opinion and incidental take statement would not have been any different under the 2019 regulations or pre-2019 regulations.

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). Under the MSA, "Federal action" means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal agency (see 50 CFR 600.910). The CHSRA proposes to carry out, along with the SJRRC, the Stockton Diamond Project, which is the construction of a grade separation of two principal railroad lines in Stockton, California. At present, the Burlington Northern and Santa Fe Railway Stockton Subdivision (BNSF-SS) and the Union Pacific Railroad Fresno Subdivision (UPRR-FS) consist of two main tracks each. These tracks intersect each other at a crossing known as the Stockton Diamond. This at-grade rail crossing at the Stockton Diamond results in significant congestion and delays to services that move people and freight throughout the California Central Valley and freight throughout the broader national network. The applicant plans to replace the existing at-grade intersection of the BNSF-SS and UPRR-FS rail lines with a structure that will elevate the UPRR-FS's main tracks above the BNSF-SS's main tracks so that both rail lines may intersect without causing delays. To elevate the UPRR-FS's main tracks, the applicant will build a flyover spanning the Mormon Slough and associated floodplain.

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would not. The following sections describe the project location, project description, and proposed avoidance, minimization, and conservation measures (AMMs).

1.3.1. Project location

The Project is located in the City of Stockton in San Joaquin County, California. It is located in the Stockton West United States Geological Survey 7.5-minute topographic quadrangle. The new railroad flyover will cross the middle of Mormon Slough at approximately 37°56'42.7"N

121°16'28.7"W. Figure 1 shows the general vicinity of the Project, and Figure 2 shows the Project area.

For the purposes of this biological opinion, the project study area is in reference to areas where the applicant assessed for adverse impacts to species and critical habitat. The northern limits of the project includes East Weber Avenue, a major east-to-west arterial in Downtown Stockton. Just north of East Weber Avenue is the Robert J. Cabral Station. The southern limit of the project study area is the Union Pacific (UP) Stockton Yard, located approximately at East Fourth Street. The eastern and western limits of the project study area are South Pilgrim Street and South Grant Street, respectively.

The proposed Project location is in an area that is mainly industrial, with some pockets of residential use. Previously, the Lower Mormon Slough supported aquatic wildlife and botanical species. However, after the construction of the Stockton Diversion Canal in 1911, the area is no longer hydrologically connected to the Calaveras River and Delta, and receives water mainly through surface runoff during large storm events. The Stockton Diversion Canal's southern end is located roughly 2.5 miles east of the Project area and connects upstream portions of the Mormon Slough to the San Joaquin River to the west. The Stockton Diversion Canal hydrologically isolates this portion of the Mormon Slough from upstream waters (the active portion of the Mormon Slough). The lower Mormon Slough is littered with extensive trash and abandoned vehicles and is occupied by unhoused individuals.

1.3.2. Project description

The proposed Project is a critical freight and passenger mobility project. The current congestion at the Stockton Diamond, an at-grade intersection for the BNSF-SS and UPRR-FS rail lines, results in delays, reliability, and performance scheduling conflicts. This rail intersection is located just south of Downtown Stockton near South Aurora Street and East Scotts Avenue, and is considered the busiest, at-grade railway junction in California. The proposed Project will replace the existing at-grade intersection with a grade separation structure that will raise UPRR-FS's main tracks above the BNSF-SS's main tracks, enabling through traffic without delays. The applicant proposes to shift the Union Pacific flyover alignment east of the existing Fresno Subdivision tracks so that construction of the new flyover would minimize impacts on existing rail operations.

The proposed Project will require construction across Mormon Slough. A closed, six-cell box culvert is part of the proposed flyover for the Project. The proposed cast-in-place, six-cell culvert will include five one-foot-wide piers in Mormon Slough, with 12-foot-wide and 12-foot-tall openings between each cell. These dimensions meet the Central Valley Flood Protection Board's 200-year flood and freeboard requirements. The proposed culvert will be 77 feet wide and 261 feet long, have an upstream flow line elevation of 5.1 feet and soffit of 17.1 feet, and downstream flow line elevation of 5.0 feet and soffit of 17.0 feet (all elevations NAVD88). The rail grade would be approximately 49 feet above the channel (Figure 3).

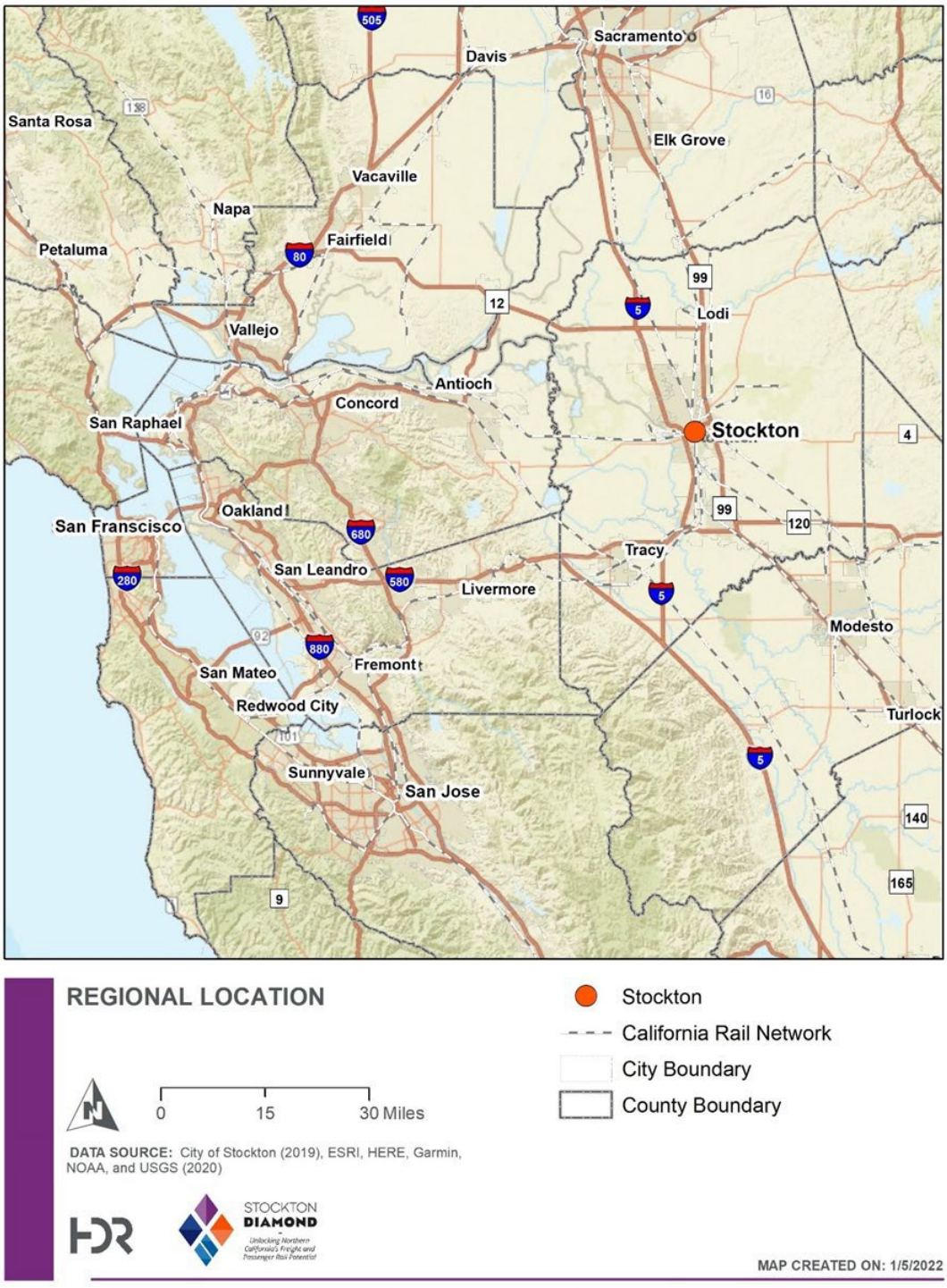

Figure 1. Regional location of the project (HDR 2024).

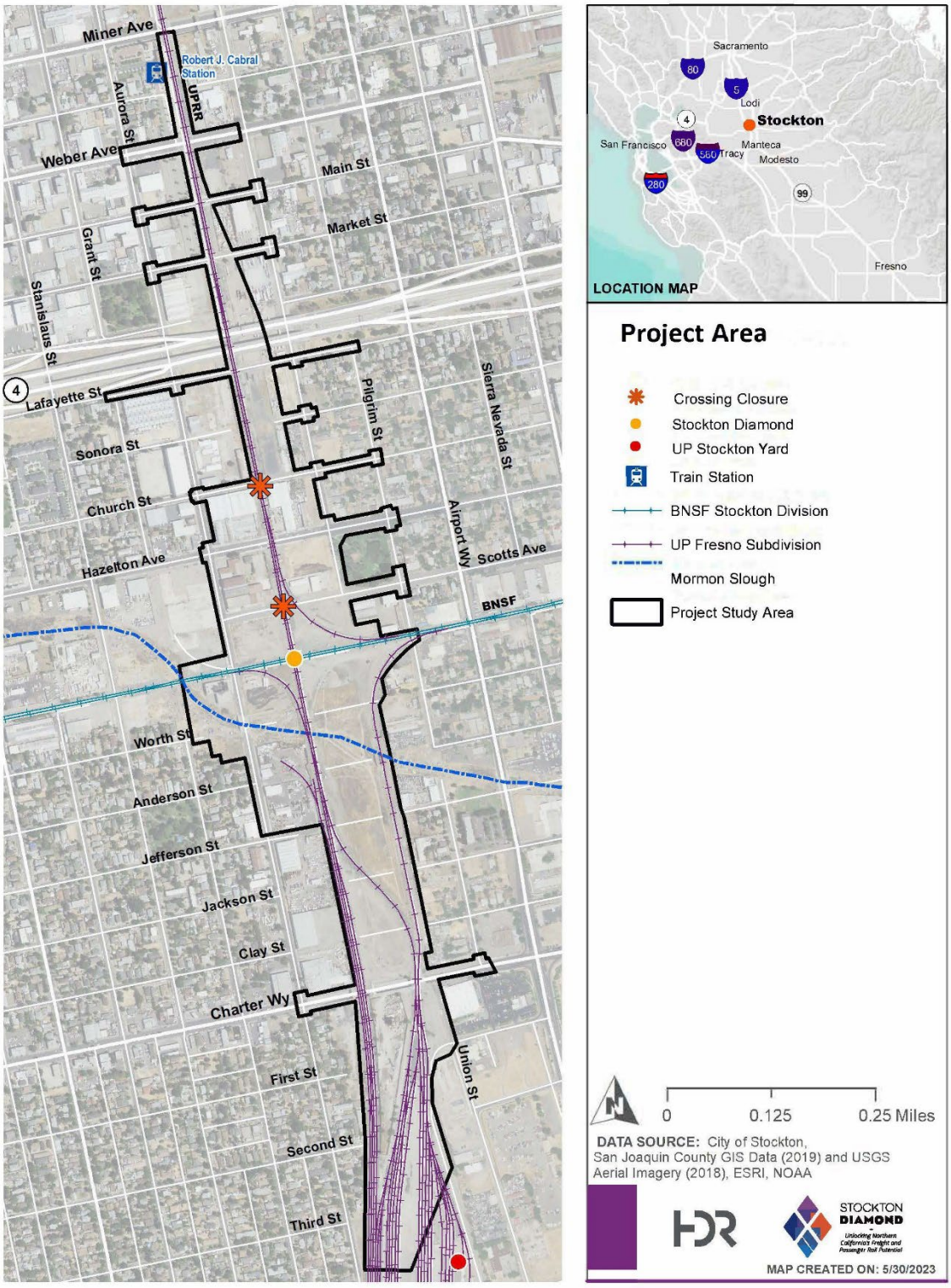

Figure 2. Project area, Stockton, California (HDR 2024).

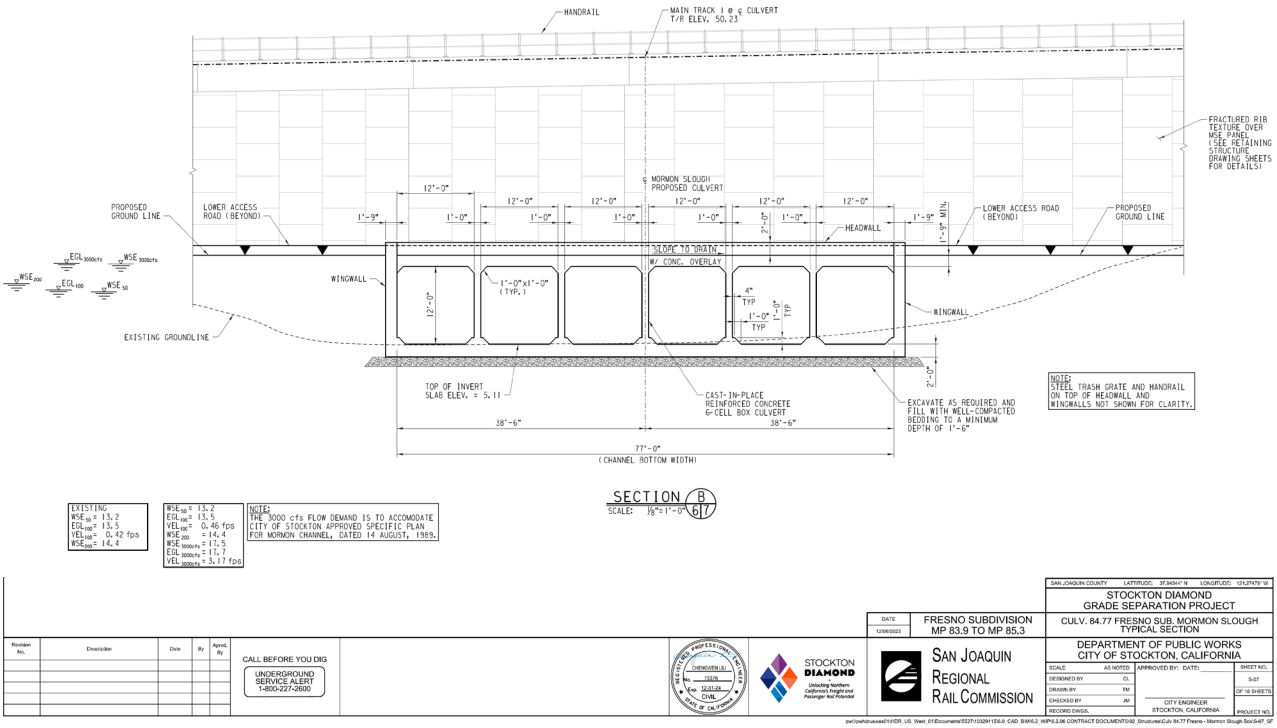

Figure 3. The proposed six-cell culvert. The proposed culvert will be 77 feet wide and 261 feet long and will create five one-foot-wide piers in the Mormon Slough with 12-foot-wide and 12-foot-tall openings between each cell (HDR 2024).

The slope of the culvert will be less than 0.1%, and the concrete substrate will have a smooth surface that will not result in flow rates that would impede fish passage should the Mormon Slough regain hydrologic connectivity. Trash grates will be installed across the entirety of the culvert on both ends with grates spaced 6 inches on-center. Rock slope protection (RSP) will be placed on slopes of the streambed adjacent to the culvert, and riprap armor will be required at the base of the culvert footing to prevent scour. The riprap armor will consist of an approximately 80-foot by 16-foot layer of 2.5-foot-thick rock riprap placed on the upstream and downstream ends of each culvert apron (Figure 4).

Existing drainage structures along Mormon Slough will remain in place after construction of the proposed slough bridge. Further, pipe culverts under the existing Union Pacific main tracks immediately west of the flyover alignment would be left in place to support the remaining at-grade connection track to BNSF. Figure 5 shows the existing bridge crossings and the orientation of the proposed crossing.

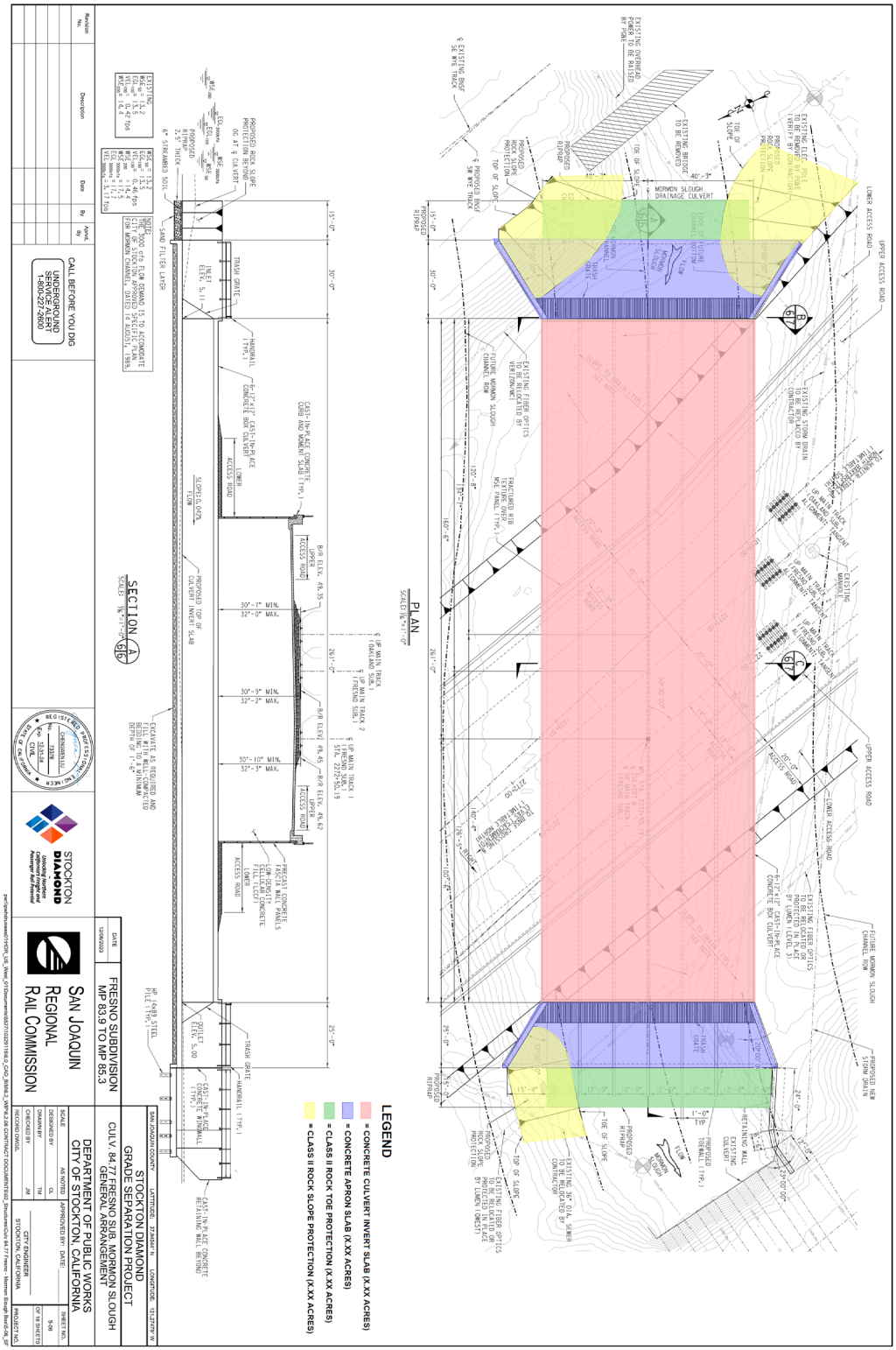

Figure 4. General arrangement of the culvert in the Mormon Slough. Trash grates will be installed across the entirety of the culvert on both ends with grates spaced 6 inches on-center. Rock slope protection (RSP) will be placed on slopes of the streambed adjacent to the culvert, and riprap armor will be required at the base of the culvert footing to prevent scour (HDR 2024).

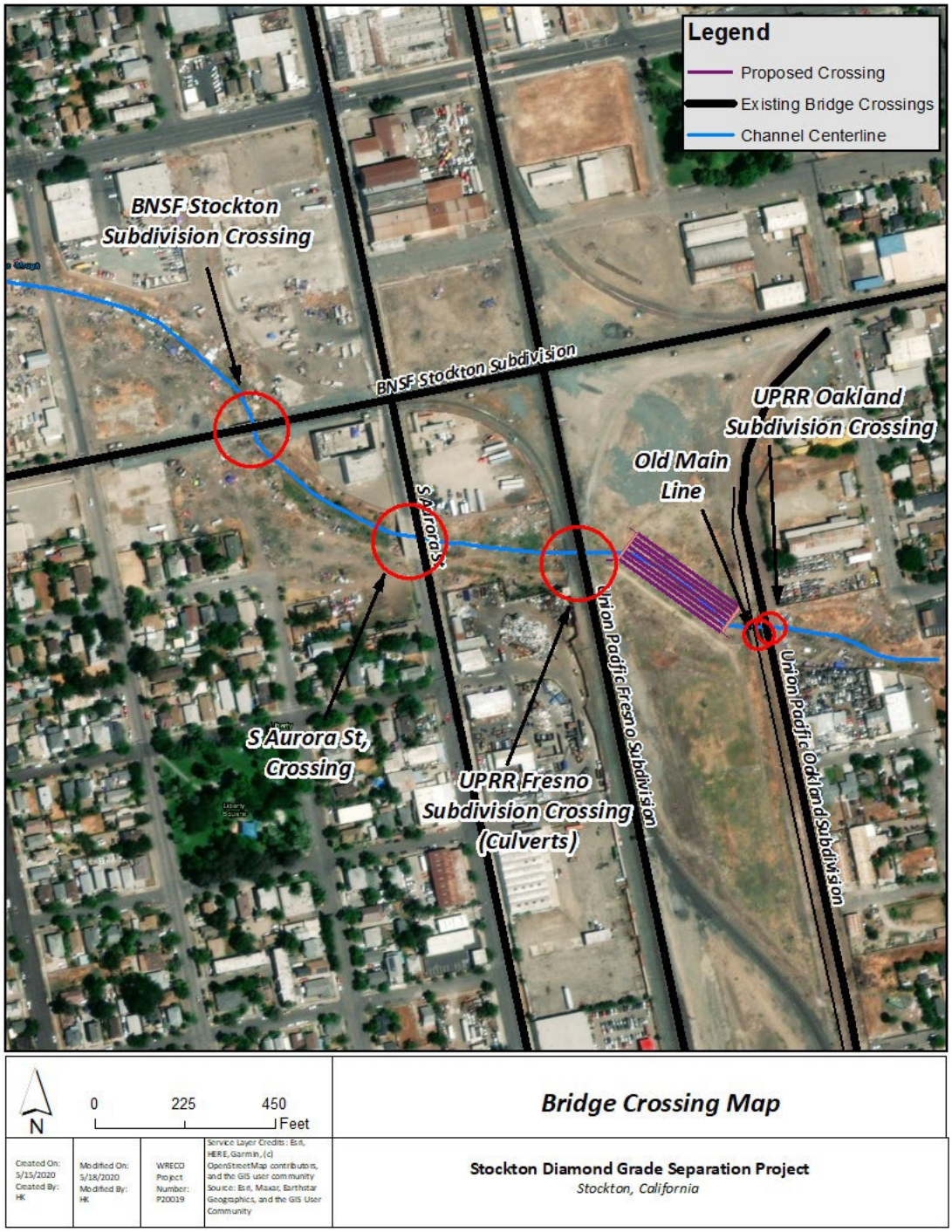

Figure 5. Existing bridge crossings and the orientation of the proposed crossing (HDR 2024).

1.3.3. Avoidance, minimization, and conservation measures

The following sections describe the measures, including several construction best management practices (BMPs), adopted to reduce or avoid adverse effects to the listed species and their designated critical habitat that could result from project construction, maintenance, or operation for the proposed Project.

Erosion and runoff prevention

Before the initiation of project-related activities, SJRRC's Resident Engineer or designated contractor will ensure that construction BMPs are employed on-site to prevent erosion or runoff of loose soil and dust. Methods will include the use of appropriate measures to intercept and capture sediment before entering the streambed, as well as erosion control measures along the perimeter of disturbance areas to prevent the displacement of fill material. During construction, SJRRC's Resident Engineer or designated contractor will ensure that all BMPs are in place before the initiation of Project-related activities and will remain until activities are complete. All erosion control methods will be maintained until all on-site soils are stable.

Minimization of construction staging areas

During construction, SJRRC's Resident Engineer or designated contractor will ensure that the work areas are reduced to the smallest practicable footprint throughout Project activities. Before any ground-disturbing activity, the SJRRC's Resident Engineer or designated contractor will establish staging areas for construction equipment that minimize impacts on sensitive biological resources, including aquatic resources. Staging areas, including any temporary material storage areas, will be occupied by existing permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. SJRRC's Resident Engineer or designated contractor will flag and mark access routes to restrict vehicle traffic within the Project footprint to established roads, construction areas, and other designated areas.

Restoration of graded areas

During construction, SJRRC's Resident Engineer or designated contractor will ensure that all exposed and/or disturbed areas resulting from Project-related activities will be returned to their original contour and grade and restored using locally native grass and forb seeds, plugs, or a mix of these methods. Areas will be seeded with species appropriate to their topographical and hydrological character. Seeded areas will be covered with broadcast straw and/or jute netted, where appropriate.

Fish passage and predation considerations

To reduce the effects of riprap on fish passage and predation, the riprap armor will be mixed with agricultural grade soil at a 70% rock to 30% soil ratio above the estimated ordinary high-water line and backfilled with a minimum of 6–12 inches of native soil. This will help support riparian growth after hydrologic reconnection, providing woody material into the streambed. To reduce predation associated with overwater structures, the applicant will paint the ceiling of the culvert with white, or similarly reflective paint, to maintain light levels needed to encourage daytime movement of juvenile salmonids.

To reduce passage impediments related to the closed box culvert, the applicant will adhere to the NMFS fish passage design criteria that states, "Concrete surfaces should be finished to ensure smooth surfaces" (NMFS 2023). The proposed Project will also involve removing trash and encampments from the streambed. After construction is complete, should hydrological

connectivity to the Mormon Slough be restored with enough freshwater flows to support fish habitat, SJRRC will modify or remove the trash grates to meet the conditions required by NMFS' fish passage guidelines in place at the time the channel is fully restored as a fish passage facility.

Reuse of stockpiled soil

During ground-disturbing activities, SJRRC's Resident Engineer or designated contractor may temporarily store excavated materials produced by construction activities in areas at or near construction sites within the Project area. SJRRC's Resident Engineer or designated contractor will ensure that excavated soil is returned to its original location to be used as backfill. Any excavated waste materials unsuitable for treatment and reuse would be disposed of at an off-site location, in conformance with applicable state and federal laws. Stockpiled, disassembled, and hazardous construction material should be stored at least 100 feet from aquatic resources.

Vehicle speed limits

During construction, SJRRC's Resident Engineer or designated contractor will ensure that all vehicle traffic associated with Project-related activities will be confined to established roads, staging areas, and parking areas. Vehicle speeds will not exceed 15 miles per hour on access roads with no posted speed limit to avoid collisions with special-status species or habitats. Additionally, maintenance or refueling of vehicles or equipment will occur in designated areas and/or in a secondary containment, located away from aquatic resources.

Mitigation banking

To offset impacts on CCV steelhead critical habitat, the applicant will voluntarily purchase either mitigation bank credits at a 1:1 ratio or an in-lieu fee (ILF) credit for permanent impacts to riparian habitat.

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. CHSRA determined the proposed action is not likely to adversely affect southern distinct population segment (sDPS) North

American green sturgeon or its critical habitat. Our concurrence is documented in the "Not Likely to Adversely Affect" Determinations section (Section 2.11).

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 CCV steelhead use(s) 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 range-wide 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.

2.2. Range-wide Status of the Species and Critical Habitat

This opinion examines the status of CCV steelhead 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 designated critical habitat, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated critical habitat, and discusses the function of the PBFs that are essential for the species' conservation.

2.2.1. Listed species and critical habitat

Table 1. Description of species, current Endangered Species Act listing classification, and summary of species status.

Species and Recovery Plans	Listing Classification and Federal Register Notice	Status Summary
CCV steelhead DPS (*Oncorhynchus mykiss*) Recovery Plan for the ESUs of Sacramento River Winter-Run Chinook Salmon and CV Spring-Run Chinook Salmon and the DPS of CCV Steelhead (CV salmonid recovery plan, NMFS 2014).	Threatened, 71 FR 834; January 5, 2006	The most recent assessment of CCV steelhead viability found that the species remains at moderate risk of extinction; however, new emerging evidence indicates that the proportions of hatchery returns to natural-origin returns are increasing, and hatcheries' influence has raised the risk of extinction from moderate to high in 11 out of 16 CCV steelhead populations (Johnson et al. 2023). Most natural-origin CCV populations are small, non-monitored, and lack the resilience to persist for protracted periods if subjected to additional stressors, particularly widespread stressors such as climate change. While updated data on steelhead in the American River is mostly based on hatchery returns, natural spawning populations within the Sacramento River tributaries have fluctuated but have shown a steady decline in the past 10 years (Johnson et al. 2023).

Table 2. Description of Critical Habitat, Designation, and Status Summary.

Critical Habitat	Designation Date and Federal Notice	Description
CCV steelhead DPS (*O. mykiss*)	September 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, and portions of the northern Delta. Critical habitat includes stream channels in the designated stream reaches and the lateral extent defined by the ordinary high-water line. In areas where the ordinary high-water line is not defined, the lateral extent is defined by the bank-full elevation. PBFs considered essential to the conservation of the species include spawning habitat, freshwater rearing habitat, freshwater migration corridors, and estuarine areas. 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.

Current Limiting Factors

The following are current limiting factors for the population numbers of the listed species included in this consultation:

- Dams block access to historical spawning and summer holding areas along with altering river flow regimes and temperatures
- Water management/diversions/barriers
- Loss of floodplain rearing habitat (levees/bank protection)
- Urbanization and rural development
- Logging
- Grazing
- Agriculture
- Mining – historic hydraulic mining from the California Gold Rush era
- Estuarine modified and degraded, thus reducing developmental opportunities for juvenile salmonids
- Predation
- Dredging and sediment disposal
- Contaminants
- Fisheries
- Hatcheries
- "Natural" factors (*e.g.*, ocean conditions)
- Climate change exacerbating flow and water temperature related impacts (see below for more detail)

2.2.2. Global Climate Change

One major factor affecting the status of the species and critical habitat for threatened and endangered anadromous fish 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 will affect CCV steelhead. Because CCV steelhead are restricted to low elevations due to impassable rim dams, if climate warms by 5°C (9°F), it is questionable whether salmonid populations can persist (Williams 2006). Factors modeled by VanRheenen et al. (2004) show that snowmelt earlier in the year leads to an increased percent reduction of spring snow water equivalent (SWE, up to 100 percent in shallow snowpack areas). Additionally, an air temperature increase of 2.1°C (3.8°F) is expected to result in a loss of about half of the average April snowpack storage (VanRheenen et al. 2004).

CCV steelhead are blocked from most of their historic spawning and rearing habitat. They spawn primarily in tributaries, and those tributaries without cold water refugia (usually input from springs) will be more susceptible to the impacts of climate change. These effects are worsened as juvenile CCV steelhead need to rear in the stream for one to two summers before 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).

Climate change will decrease the conservation value of the PBFs of critical habitat, including adequate water and flow, unimpeded access to and from spawning ground, and safe passage conditions for migration. Unless offset by improvements in other factors, the status of CCV steelhead critical habitat is likely to decline over time. The climate change projections referenced above cover the present and approximately 2100. While projections remain uncertain, the direction of change is relatively clear (McClure et al. 2013).

2.2.3. Recovery plan

In July 2014, NMFS released a final recovery Plan for SR winter-run Chinook salmon, CV spring-run Chinook salmon, and CCV steelhead (NMFS 2014). The salmonid recovery plan outlines actions to restore habitat and access and improve water quality and quantity conditions in the Sacramento River to promote the recovery of listed salmonids. Key recovery actions in the recovery plan include conducting landscape-scale restoration throughout the Delta, incorporating ecosystem restoration into Central Valley flood control plans that include breaching and setting back levees, and restoring flows throughout the Sacramento and San Joaquin River basins and the Delta.

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 applicant will install a 77-foot-wide and 261-foot-long, six-celled box culvert into the streambed of the Mormon Slough. Riprap armor will consist of an approximately 80-foot by 16-foot layer of 2.5-foot-thick rock riprap placed on the upstream and downstream ends of each

culvert apron. The proposed Project will include instream construction, clearing, and grading. Operation of heavy equipment will be limited to the smallest practicable footprint. Hydrologic connectivity could be established during construction, and areas downstream could be affected by construction activity. Turbidity estimates from a previous project assumed that turbidity plumes of 25–75 NTU could extend up to 1,000 ft (304.8 m) downstream from the project area (NMFS 2006). Thus, the action area includes areas where construction will occur and areas 1,000 feet downstream of construction activity.

In addition, the proposed action includes the purchase of bank credits or ILF program to offset temporary and permanent streambed and riparian impacts and steelhead habitat; however, the applicant to date has not specified which bank credits or ILF program will be purchased. Therefore, we include all mitigation banks and ILF programs that currently service the Project site and offer credits to offset impact to these habitat types in the action area for the proposed action. These include:

- Fremont Landing Conservation Bank: a 100-acre site along the Sacramento River that provides riparian, wetland, and open-water habitat. The restoration site is included in the action area of the proposed action.
- National Fish and Wildlife Federation (NFWF) Sacramento District California ILF Program: Provides aquatic resource credits for authorized impacts to wetlands (excluding vernal pools), other Waters of the U.S., Waters of the State, and anadromous resources listed under the ESA. The Calaveras and Stanislaus service area includes the Project site. Restoration activities resulting from credit purchases from the NFWF ILF program may occur throughout anadromous waters within the Calaveras and Stanislaus service area (HUC 8: 18040003, 18040011, 18040010, 18040051); therefore, this area is included in the action area of the proposed action.

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 impacts to listed species or designated critical habitat from federal agency activities or existing federal 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. Hydrology

A U.S. Army Corps of Engineers (USACE)-verified wetland delineation for the Project identified that the Mormon Slough is no longer defined as a Water of the United States due to the absence of an Ordinary High-Water line. No channels are present in the action area. The portion of the Mormon Slough that runs through the Project area does not support riparian vegetation, is

highly disturbed, is littered with trash and abandoned vehicles, and is occupied by unhoused individuals. McLeod Lake used to be hydrologically connected to Mormon Slough and is located 7,000 feet downstream of the location of the proposed culvert. The area lost hydrologic connectivity in 1911 after the completion of the Stockton Diversion Canal.

2.4.2. Topography and geomorphology

The topography in the survey area has few elevation changes and is relatively flat, other than in shallow depressions scattered across the survey area and in the inactive channel of Mormon Slough. Elevations adjacent to the Mormon Slough in the action area range from 17 feet upstream to 14 feet in the downstream end of the action area. Mormon Slough has a mostly coarse, sandy sediment texture with some granules interspersed, a shallowly sloped profile, and a side slope ranging from approximately 15 to 25 percent.

2.4.3. Vegetation

Vegetation within Mormon Slough is primary upland grasses and forbs. The lowest portion of the channel is mostly devoid of vegetation, with some small, scattered patches of nonnative and/or invasive species dominated by annual grasses and forbs along with sparsely distributed, small-statured box elder (*Acer negundo*), tree-of-heaven, white alder (*Alnus rhombifolia*), eucalyptus trees, and Mexican fan palm (*Washingtonia robusta*). The section of Mormon Slough that bisects the action area is highly disturbed and supports a large population of unhoused individuals, resulting in large amounts of refuse and other evidence of ongoing human disturbance. Regular scouring or water flow is not evident, and the channel does not currently convey water or support hydrophytic vegetation.

2.4.4. Status of federally listed species and/or critical habitat in the action area

At present, there are currently no fish present in the action area within Mormon Slough. Critical habitat for CCV steelhead in the action area includes rearing and migratory habitat PBFs.

2.4.4.1 Factors affecting critical habitat in the action area

The Recovery Plan for The Evolutionarily 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) identifies Lower Mormon Slough as a potential location for anadromous fish habitat improvements and fish passage improvements (NMFS 2014). The San Joaquin Area Flood Control Agency (SJAFCA) requested the USACE initiate a study of Lower Mormon Slough in 1998 and supported the Mormon Channel Ecosystem Restoration and Central Stockton Flood Bypass Project to hydrologically reconnect and restore the Mormon Slough (HDR 2024; California Center for Collaborative Policy 2012).

In 2018, the Lower San Joaquin River Project included alternatives that would hydrologically reconnect the Mormon Slough; however, those alternatives were not selected due to a cost/benefits analysis (USACE 2018). SJAFCA has also identified the Mormon Channel Bypass

as a priority initiative for feasibility-level investigation of the Central Valley Flood (SJAFCA 2021). Although a permitted or funded project has not been identified to hydrologically reconnect the Lower Mormon slough, local support to address flooding issues has recently been featured in the news (San Joaquin County 2023, Bland 2023), and SJAFCA has stated that they are working with local stakeholders to continue to seek hydrological reconnection of the area (HDR 2024).

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 but that are not part of the 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 402.02).

The following sections analyze the effects of specific components of the proposed action to listed fish species and critical habitat: 1) sediment and turbidity, 2) contaminants, 3) channel modification, 4) noise and sound pressure, and 5) voluntary purchase of ILF/bank credits.

2.5.1. Effects of sediment and turbidity

The action area does not currently support aquatic species, but if the action area became hydrologically connected during construction activity, sediment mobility, and turbidity may increase because of project actions. Construction-related increases in sedimentation and turbidity above the background level could affect fish species and their habitat by reducing juvenile survival, interfering with feeding activities, causing a breakdown of social organization, and reducing primary and secondary productivity. If the area were to become hydrologically connected during construction activity, the current conditions of the slough are so degraded that the listed species would not likely be present. With the incorporation of AMMs, the effects of sediment and turbidity on listed species are not expected to occur. Short-term increases in turbidity and suspended sediment levels may temporarily impact rearing and migration critical habitat PBFs through avoidance or displacement from preferred habitat. However, these adverse effects are expected to be temporary, lasting only as long as project construction actions.

2.5.2. Effects of contaminants

During construction, the potential exists for spills or leakage of toxic substances that could enter the action area. Refueling, operation, and storage of construction equipment and materials could result in accidental spills of pollutants (*e.g.*, fuels, lubricants, concrete, sealants, and oil). High concentrations of contaminants are lethal to fish. There are currently no listed species in the action area. If the area were to become hydrologically connected during construction activity, the current conditions of the slough are so degraded that listed species would not likely be present. With the incorporation of AMMs, exposure to contaminants is not expected.

During construction, refueling, equipment storage, and maintenance activities, toxic substances could spill or leak into the action area and could negatively affect PBFs of critical habitat including freshwater migratory and rearing habitat. AMMs will reduce the likelihood of contaminant-related harm to critical habitat; thus, potential negative effects from hazardous materials on designated critical habitat are, therefore, not expected to occur.

2.5.3. Effects of channel modification

Construction activity will result in a large box culvert furnished with trash grates and riprap placed on the upstream and downstream ends of each culvert apron. Riprap reduces shoreline habitat that could otherwise be riparian vegetation. Further, Windell et al. (2017) found that riprapped reaches of the Upper Sacramento River typically have low habitat complexity, low abundance of food organisms, and offer little protection from predators. Should hydrologic connectivity reoccur, riprap will reduce the restoration potential of Mormon Slough and degrade the value of the habitat for the conservation of the listed species.

Additionally, the culvert will stand as an overwater structure in Mormon Slough. Overwater structures can interfere with the ecological functions of the habitat. The shadow cast by an overwater structure affects plant and animal communities below the structure. Distributions of plants, invertebrates, and fishes are severely limited in under-cover environments when compared to adjacent, unshaded-vegetated habitats. Under-pier light levels fall below threshold amounts for the photosynthesis of diatoms, benthic algae, eelgrass, and associated epiphytes and other autotrophs. Macrophytes can be reduced or eliminated, even by partial shading of the substrate, and have little chance to recover (PFMC 2014).

Fishes rely on visual cues for spatial orientation, prey capture, schooling, predator avoidance, and migration. The reduced-light conditions found under an overwater structure limit the ability of fish, especially juveniles and larvae, to perform these essential activities. Shading from overwater structures may also reduce prey organism abundance and the complexity of the habitat by reducing aquatic vegetation and phytoplankton abundance (Kahler et al. 2000, Haas et al. 2002). The shadow cast by an overwater structure may furthermore increase predation on federally listed and EFH-managed species by creating a light/dark interface that allows ambush predators to remain in a darkened area and watch for prey to swim by against a bright background (Helfman 1981). Prey species moving around the structure cannot see predators in the dark area under the structure and are more susceptible to predation. Additionally, the reduced vegetation densities associated with overwater structures decrease the available refugia from predators (PFMC 2014).

Because there are currently no fish in the action area, channel modification construction activities are not expected to affect CCV steelhead individuals. If the area were hydrologically connected in the future, the current proposed AMMs would help to reduce the risks to juvenile CCV steelhead associated with the behavioral changes that are caused by overwater structures. Effects of the action, including the loss of natural streambed and the placement of riprap, diminish the value of the PBFs of rearing and migratory critical habitat. If the area were to become hydrologically connected in the future, current project proposed AMMs are expected to

help to reduce the permanent impacts associated with the Project; however, the Project will result in a loss to CCV steelhead critical habitat.

2.5.4. Effects of noise and sound pressure

There are no listed species present in the action area; thus, noise and sound pressure are not expected to adversely affect listed species. If the area were to become hydrologically connected during construction activity, the current conditions of the slough are so degraded that listed species would not likely be present. Exposure to the effects of noise and sound pressure is not expected to occur.

Project activities are expected to cause increases in noise, motion, and vibrations throughout the implementation of the proposed action, which can temporarily affect rearing and migration critical habitat PBFs through avoidance or displacement from preferred habitat. Critical habitat effects from noise, motion, and vibration are expected to be temporary and limited to the direct vicinity of activities over the lifetime of the proposed action; thus, noise increases from the proposed action is not expected to reduce the overall value of the critical habitat for CCV steelhead.

2.5.5. Purchase of ILF and/or Mitigation Bank Credits

The proposed action includes the purchase of mitigation credits at a NMFS-approved ILF program or mitigation bank to offset impacts to steelhead critical habitat. Credits will be purchased at a 1:1 ratio for riparian habitat.

The purchase of mitigation credits can provide conservation benefits to steelhead, because the NMFS-approved ILF Program/mitigation banks that serve the Project area provide a high level of certainty that the benefits of a credit purchase will be realized. These options have mechanisms in place to ensure credit values are met over time. Such mechanisms include legally binding conservation easements, long-term management plans, detailed performance standards, credit release schedules that are based on meeting performance standards, monitoring plans and annual monitoring reporting to NMFS, non-wasting endowment funds that are used to manage and maintain the bank and habitat values in perpetuity, performance security requirements, a remedial action plan, and site inspections by NMFS.

Fremont Landing Conservation Bank is located on the mainstem Sacramento River within critical habitat for CCV steelhead. A purchase of riparian floodplain forest/salmonid habitat restoration mitigation credits at the bank would benefit steelhead freshwater rearing habitat and migration corridors by providing suitable floodplain and riparian habitat.

The NFWF Sacramento District ILF program covers the entire California Central Valley and credits are sold within geographic service areas to compensate for permitted impacts to aquatic resources. Unlike conservation/mitigation banks where habitat restoration activities have occurred before credit purchase, habitat restoration activities funded by the ILF program will occur after the credit purchase and may include restoration of riparian, floodplain, wetland, and riverine habitats or purchase of equivalent habitat restoration credits from a future

mitigation/conservation bank within the given service area. The delay in restoration activities following a credit purchase from the NFWF Sacramento District ILF program may take up to 3 years and can be extended upon approval of NMFS and the other approving regulatory agencies. The Calaveras and Stanislaus River service area that covers the project site includes stream reaches that are designated critical habitat for CCV steelhead, stream reaches that are occupied and not designated critical habitat for CCV steelhead, and stream reaches that are neither occupied or designated critical habitat for CCV steelhead. There is an agreement between the NFWF Sacramento District ILF program and NMFS that credit purchases from the program for NMFS permits shall be used to fund habitat restoration within anadromous waters. Therefore, a purchase of aquatic resource credits within the Calaveras and Stanislaus River service area would benefit steelhead by funding habitat restoration activities within the stream reaches of the service area that are either designated critical habitat for CCV steelhead or are occupied by CCV steelhead but are not designated critical 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]. 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).

2.6.1. Increased urbanization

Increases in urbanization can affect habitat by altering watershed characteristics and changing 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 situated away from water bodies, will not require Federal permits and thus will not undergo review through the ESA section 7 consultation process with NMFS.
A toxicant associated with increased urbanization is 6PPD-quinone. 6PPD-quinone is the byproduct of the oxidation of a chemical that manufacturers apply to vehicle tires to improve their durability. Tian et al. (2020) found that stormwater exposure caused acute mortality to Coho salmon in the Northwest secondary to the presence of 6PPD-quinone at lethal levels.

2.6.2. Habitat restoration

Voluntary state or privately sponsored habitat restoration projects may have short-term negative effects associated with in-water construction work, but these effects typically are temporary and localized, and the overall outcome should benefit listed species and habitats.

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.

2.7.1. Integrated analysis of the effects of the proposed action on the federally listed species

Summary of the effects of the proposed action on federally listed species

Section 2.5, Effects of the action, analyzes the anticipated effects of the proposed Project. The Project is not expected to adversely affect CCV steelhead because they are not present in the action area. Negative effects from sediment and turbidity, contaminants, and noise and sound pressure on listed species are unlikely to occur. If hydrologic connectivity of the action area were to reoccur during construction, the habitat is so degraded that listed species would not likely be present until natural recruitment or restoration projects made the action area habitable. Proposed AMMs are expected to help to reduce the negative effects of the action on fish passage and predation. Mitigation/ILF credits are expected to have beneficial impacts on federally listed species; however, these credits were not included in this analysis given uncertainty regarding what site will be chosen for restoration and what specific restoration actions will occur at that site. This does not discount the importance of the action that was made in good faith towards the recovery of the species.

Summary of the status of the species and environmental baseline

Section 2.2, Range-wide status of CCV steelhead, indicated that worsening habitat conditions threaten their viability. The effects of climate change, including drought events, increased stream flow, and potentially lethal water temperatures, greatly affect CCV steelhead. Other threats to the species include habitat fragmentation, poaching, and domestic influence from hatcheries. Recommended future actions for threat reduction include research on the impact of habitat restoration and modification, continued efforts to remove barriers to migration, efforts to reduce entrainment of juveniles at water diversions through the development of screening and fish passage criteria, and efforts to reduce poaching (Vick et al. 2021).

Section 2.4, Environmental baseline, indicated that the action area is no longer defined as a Water of the United States due to the absence of an Ordinary High-Water line, no channels are present in the action area, and the portion of the Mormon Slough that runs through the Project area does not support riparian vegetation, is highly disturbed, is littered with trash and abandoned vehicles, and is occupied by unhoused individuals. The action area includes the PBFs of

migratory and rearing habitat, but because of the lack of hydrologic connectivity and habitat degradation, these PBFs are not accessible by listed species.

Summary of the impact of cumulative effects

The 2023 County Level Economic Forecast for San Joaquin predicts that the population, number of jobs, and available housing will increase in the coming years (Caltrans 2023). Impacts on CCV steelhead, secondary to urbanization, include increased resource allocation, waste and wastewater production, and use of water resources. Climate change has affected winter precipitation, resulting in more rainfall than snow, the loss of which leads to less streamflow in the late spring/early summer and potentially more streamflow in winter (Sun et al. 2016), and urbanization stands to put further pressure on water availability.

Restoration of the Lower Mormon Slough may improve habitat conditions for federally listed species. While there are no current plans to restore hydrologic connectivity to the action area, there are interested parties who are advocating for reconnection. The SJAFCA has stated that they are working with stakeholders to reconnect Mormon Slough. This would result in the inundation of the Project area and hydrologic connectivity to areas upstream and downstream of the Project area. When this occurs, restoration projects would be essential to ensure that the slough can provide quality habitat to federally listed species.

Survivability based on viability criteria

We cannot achieve salmonid recovery without providing sufficient habitat (NMFS 2014). Delisting criteria for CCV steelhead will require the reestablishment of historical diversity groups. Diversity Groups (population groups) are salmonid ecoregions based on climatological, hydrological, and geological characteristics (NMFS 2014). Delisting criteria for CCV steelhead include:

- One population in the Northwestern California Diversity Group at low risk of extinction
- Two populations in the Basalt and Porous Lava Flow Diversity Group at low risk of extinction
- Four populations in the Northern Sierra Diversity Group at low risk of extinction
- Two populations in the Southern Sierra Diversity Group at low risk of extinction
- Maintain multiple populations at moderate risk of extinction

Taking into consideration the effects of the Project in the action area, the baseline and status of the species, and the impacts of cumulative effects, the proposed action should not reduce the likelihood of both the survival and recovery of CCV steelhead.

2.7.2. Integrated analysis of the effects of the proposed action to critical habitat

Summary of the effects of the proposed action on critical habitat

Section 2.5, Effects of the action, includes the anticipated effects of the proposed action on critical habitat. The placement of the box culvert and riprap will affect approximately 0.757 acres

and will adversely affect CCV steelhead rearing and migration critical habitat PBFs. While mitigation credits are proposed to offset habitat impacts, restoration activities associated with these mitigation credits may occur outside of critical habitat; therefore, the effects of mitigation/ILF credits are not included in this analysis.

Summary of the environmental baseline and status of the critical habitat

Lower Mormon Slough is included in the critical habitat designation for CCV steelhead, and has the PBFs of rearing and migratory habitat. The channel does not currently convey water or support hydrophytic vegetation, and the channel bottom consists of clay, sand, and silt, with little gravel.

Summary of the impact of cumulative effects

Restoration activity would improve the habitat in the Mormon Slough. Restoration activity could include riparian planting and the placement of large woody debris in the watershed. Riparian habitat is necessary for successful juvenile development and survival and is known to decrease erosion, improve bank stability, and provide thermal refugia for federally listed species.

Overall effects to CCV steelhead DPS and critical habitat and the Designation Level

While the action area is currently degraded, it is designated critical habitat for CCV steelhead, and the proposed action would result in 0.757 acres of streambed that are permanently altered. CCV steelhead critical habitat rearing and migration corridor PBFs will be adversely affected by the action, resulting in a loss in overall available habitat. These effects would be limited to a small proportion of CCV steelhead rearing and migration critical habitat PBFs. Therefore, the proposed action is not expected to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species

2.8. 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 the cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of CCV 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 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.

Although fish do not currently have access to the Action Area, the effects of the action will permanently diminish/degrade the value of rearing and migratory critical habitat PBFs, resulting in harm to the species when they are able to access the habitat.

2.9.1. Amount or Extent of Take

In the biological opinion, NMFS determined that the proposed action is reasonably certain to result in incidental take of CCV steelhead in the form of harm. The proposed action will permanently occupy/alter 0.757 acres of designated critical habitat within the Mormon Slough. NMFS cannot, using the best available information, accurately quantify the anticipated incidental take of individual listed fish because of the variability and uncertainty associated with the population size of the species, annual variations in the timing of migration, and uncertainties regarding individual habitat use within the action area. However, it is possible to designate an ecological surrogate for the extent of take anticipated to be caused by the proposed action, with the ability to monitor the surrogate to determine the level of take that is occurring.

The most appropriate ecological surrogate for providing a quantifiable metric for determining the extent of incidental take is the extent of the action permanently occupying/degrading critical habitat PBFs. When CCV steelhead are able to access the modified habitat, they are likely to exhibit behavioral changes (such as avoidance), resulting in migration delay and displacement, which increases predation risk, resulting in decreased survival; decreased feeding resulting in reduced growth; and increased competition, resulting in reduced fitness.

If more than 0.757 acres of critical habitat are altered, the anticipated incidental take levels are exceeded, triggering the need to reinitiate consultation. 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.

2.9.2. Reasonable and Prudent Measures

“Reasonable and prudent measures” refer to those actions the Director considers necessary or appropriate to minimize the impact of the incidental take on the species (50 CFR 402.02).

NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of federally listed species:

1. Measures shall be taken to ensure that contractors, construction workers, and all other parties involved with the proposed action implement the AMMs, as detailed in the BA and this opinion.

2. Measures shall be taken to ensure that the applicant monitors, assesses, and provides a post-action report to NMFS.

2.9.3. 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. The CHSRA 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 term and condition implements reasonable and prudent measure number 1:

    a) CHSRA shall provide a copy of this response to the prime contractor, in order to educate and inform all other contractors involved in the project as to the recommendations of this Biological Opinion.

2. The following term and condition implements reasonable and prudent measure number 2:

    a) The applicant shall submit to NMFS an annual report describing the impacts of the proposed action. This shall include any fishes known to have been killed or injured due to the project.

    b) This report shall be submitted, preferably by email, annually by December 31, to the NMFS California Central Valley Office:
        ccvo.consultationrequests@noaa.gov
        National Marine Fisheries Service
        Assistant Regional Administrator
        California Central Valley Office
        650 Capitol Mall, Suite 5-100
        Sacramento, California 95814

2.10. Reinitiation of Consultation

This concludes formal consultation for the Stockton Diamond Grade Separation 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."

2.11. "Not Likely to Adversely Affect" Determinations

For purposes of 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 a listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial (USFWS and NMFS 1998). Beneficial effects are contemporaneous positive effects without any adverse effects to the species. 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.

sDPS North American green sturgeon

The action agency determined that the proposed action may affect, but is not likely to adversely affect sDPS green sturgeon or its critical habitat. These determinations were reached because the action area is hydrologically isolated and disconnected from downstream waters that may harbor these species, and individuals of the species are not present in the action area, as the waterway is typically completely dry without any water flow to or from anadromous waterways.
The effects of the action on sDPS green sturgeon and its critical habitat (no PBFs present in the action area) are discountable as they are extremely unlikely to occur. Based on this analysis, NMFS concurs with CHSRA that the proposed action is not likely to adversely affect the above listed species and critical habitat.

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 associated physical, chemical, and biological 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 may result from actions occurring within EFH or outside of it and may include direct, indirect, site-specific or habitat-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 (50 CFR 600.905(b).

3.1. EFH Affected by the Proposed Action

The proposed project occurs within EFH for Chinook salmon, managed within the Pacific Coast Salmon Fisheries Management Plan. EFH in the action area effected by the Project consists of adult migration habitat and juvenile rearing and migration habitat. Habitat areas of particular concern (HAPCs) for Pacific Coast Salmon include (1) complex channels and floodplain habitats, (2) thermal refugia, (3) spawning habitat, (4) estuaries, and (5) marine and estuarine submerged aquatic vegetation; however, HAPCs are not present in the action area.

3.2. Adverse Effects on EFH

NMFS determined the proposed action would adversely affect EFH as follows:

- Permanent habitat loss/modification
- Reduced shelter from predators
- Reduction/change in aquatic macroinvertebrate production
- Reduced habitat complexity
- Reduced supply of terrestrial food resources

3.3. EFH 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.

1. The applicant shall modify or remove the trash grates on the box culvert to meet the conditions required by NMFS' fish passage guidelines in place at the time the channel is restored.

3.4. Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the CHSRA 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)).

3.5. Supplemental Consultation

The CHSRA 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 CHSRA and SJRRC. Individual copies of this opinion were provided to the CHSRA. 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.

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 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 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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