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 ECO #: WCR-2024-00213

February 20, 2024

Matthew Roberts
Chief, Regulatory Division
CA North Section
U.S. Army Corps of Engineers, Sacramento District
1325 J Street, Room 1350
Sacramento, CA 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 Notre Dame Blvd. Over Little Chico Creek Bridge Project (SPK-2023-00192)

Dear Mr. Roberts:

Thank you for your letter of January 4, 2024, 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 Notre Dame Blvd. Over Little Chico Creek Bridge Project (SPK-2023-00192).

Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act [16 U.S.C. 1855(b)] for this action.

Based on the best available scientific and commercial information, the biological opinion concludes that the Notre Dame Blvd. Over Little Chico Creek Bridge Project is not likely to jeopardize the continued existence of the federally listed threatened Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*) evolutionarily significant unit (ESU) or threatened California Central Valley (CCV) steelhead (*O. mykiss*) distinct population segment (DPS) and is not likely to destroy or adversely modify the designated critical habitat of CCV steelhead. 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.

Please contact Ellen McBride in the NMFS California Central Valley Office via email at ellen.mcbride@noaa.gov or via phone at (916) 930-3712 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

Enclosure

cc: ARN 151422-WCR2023-SA00025

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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

Notre Dame Blvd. Over Little Chico Creek Bridge Project (SPK-2023-00192)

NMFS Consultation ECO Number: WCR-2024-00213

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
Central Valley spring-run Chinook salmon (*O. tshawytscha*)	Threatened	Yes	No	NA	NA

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: **February 20, 2024**

Table of Contents

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 April 26, 2023, NMFS received a letter from the U.S. Army Corps of Engineers (USACE) requesting informal consultation and a Biological Resource Assessment (BRA) for the project.
- On May 5, 2023, NMFS sent a letter to USACE requesting additional information, including project timeframe, activities proposed, methods details, effects of the action, and potential riparian habitat impacts, and provided recommendations to minimize potential impacts to listed species and critical habitat.
- On May 11, 2023, NMFS and the applicant's agent, Gallaway Enterprises (applicant – City of Chico), met to discuss information requested, timelines, and consultation procedures. Gallaway Enterprises indicated they would incorporate requested information into a separate Biological Assessment (BA) for the project and engage with NMFS through technical assistance (TA) while drafting the BA.
- On June 1, 2023, Gallaway Enterprises informed NMFS of delays in the development of the BA. NMFS recommended that the project be withdrawn from USACE until the BA can be developed and sufficient information can be provided.
- On June 12, 2023, NMFS sent USACE a notice of consultation close out due to insufficient information.
- From June 28, 2023 to November 9, 2023, NMFS and Gallaway Enterprises met multiple times to discuss the project during development of the BA, including project impacts, minimization measures, and proposed mitigation for permanent impacts. NMFS provided

recommendations to minimize potential impacts to listed species and habitat in the action area and the applicant incorporated into the proposed action the following measures:

- Use of low-intensity lighting in proximity to water bodies and adding shields to light fixtures on or around the bridge.
- Avoid use of tire particles or recycled tire materials in all project design components (e.g., rubberized asphalt) or in any stormwater infrastructure to prevent further mobilization of 6PPD-quinone into fish-bearing streams.
- Removed trees be placed in the streambed in the action area where feasible to provide large woody material (LWM) for juvenile rearing habitat.
- Plant root structures will be left intact where feasible.
- Disturbance to the channel and banks of Little Chico Creek and/or removal of vegetation will be kept to the minimum necessary to complete project activities.
- Disturbed banks and upland areas will be re-seeded with a native seed mix post-construction and bank vegetation will be restored where feasible with fast-growing plants (e.g., willows) post-construction as an additional erosion control measure.
- Portions of the streambed of Little Chico Creek disturbed by temporary construction activities will be restored to a pre-construction condition.

NMFS and Gallaway Enterprises discussed mitigation for permanent impacts to critical and riparian habitat resulting in the applicant proposing the following measures:

- For permanent (0.142 acres) and temporary impacts (0.030 acres) to CCV steelhead critical habitat from the placement of rock slope protection (RSP), piers, shading from the bridge, and in-channel construction activities (0.17 acres total): Purchase salmonid habitat restoration credits at a 3:1 ratio from the Fremont Landing Conservation Bank.
- For permanent impacts to shaded riparian aquatic (SRA) habitat (0.17 acres): Mitigate with in-kind, on-site restoration at a 4:1 ratio with a 5-year monitoring and management period to ensure that plants have become established and to improve long-term survival rates. If temporal delays in restoration will occur, an additional 1:1 ratio will be added (for each year that restoration is delayed). Native vegetation will be used in restoration.
- For the additional removal of six trees (≥ 4-inches diameter breast height (DBH)) in the riparian zone: Mitigate with in-kind, on-site restoration at a 3:1 ratio with a 5-year monitoring and management period to ensure that trees have become established and to improve long-term survival rates. If temporal delays in restoration will occur, an additional 1:1 ratio will be added (for each year that restoration is delayed). Native trees will be used in restoration.

- On January 3, 2024, the applicant purchased 0.51 acres of riparian floodplain/salmonid habitat restoration conservation credits from Fremont Landing Conservation Bank to mitigate for permanent impacts to CCV steelhead critical habitat (Gallaway Enterprises provided NMFS with the receipt on January 29, 2024).
- On January 4, 2024, NMFS received a letter requesting formal consultation and a BA from USACE for the project.
- On January 18, 2024, NMFS sent a letter to USACE requesting additional information. From January 19, 2024 to January 29, 2024, NMFS and Gallaway Enterprises met to discuss stormwater runoff treatment, pile driving, and dewatering activities, as well as

recommendations to minimize impacts to listed species. The applicant proposed the additional following measures:
    - If flowing water is present during the in-water work window of June 1 to October 15, a dewatering, temporary water diversion system, and fish relocation plan will be developed and approved by NMFS prior to commencement of in-water work.
    - Pile-driving activities will occur between July 1 and October 15, when the creek is expected to be low flowing/dry/disconnected. If flowing water is present in the creek during the beginning of the proposed pile-driving timeframe, pile driving will be delayed until the creek is dry (i.e. dry from dewatering activities or naturally occurring) or when flows (i.e. low flowing or pooled, disconnected water) and water temperatures are unlikely suitable for any life stage of salmonid.
- On February 2, 2024, NMFS received an updated BA from USACE for the project. On February 6, 2024, Gallaway Enterprises clarified final project details via email, and as sufficient information had been provided, formal consultation was initiated.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the opinion and incidental take statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

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

1.3.1. Project Description

The City of Chico (City) proposes to construct a new bridge to connect the existing sections of Notre Dame Boulevard (Blvd) to provide a transportation corridor over Little Chico Creek in response to the newly developed and planned development of the Meriam Park Development Project. The project is located between two disjunct sections of Notre Dame Blvd, in the eastern limits of the City of Chico, Butte County, California at latitude 39.734879 and longitude -121.795435 (Figure 1). Project work will occur from March to November 2025 for an estimated 275 working days; however, the project may be delayed due to delays in permitting. If delays occur with the expected 2025 project timeline, the project will occur from March to November

2026 for an estimated 275 working days. Work within the Little Chico Creek channel will be limited to June 1 to October 15, when the creek is expected to be dry/low flowing/disconnected.

Construction of the New Bridge

The new bridge will be a multi-span structure, approximately 100 feet in length, 56 feet wide, and 9 feet tall from the creek bed to the bottom of the bridge deck. The structure type is a three-span, cast-in-place, reinforced concrete bridge with 30-degree skew, a 2.0% Cambered 20-inch thick concrete deck and will include rock slope protection (RSP) at the banks under and adjacent to the bridge. The new bridge will be oriented in a north-south direction and will accommodate two 12-foot travel lanes, two 8-foot bike lanes, a 5-foot sidewalk on the west side and an 8-foot multi-use path on the east side. The City incorporated Low Impact Development (LID) bridge design features to minimize effects to Little Chico Creek including minimizing the number of piers (2) and bridge width. Proposed construction equipment includes an impact pile driver, vibratory pile driver, auger drill rig (for drilled piles), crane, heavy trucks, excavators, bulldozers, pumps, generators, air compressors, cement mixers, graders, compactors, scrapers, backhoes, and loaders.

Construction of the roadway approaches will involve the removal and realignment of a portion of the existing bike path. The existing bike path extends east and west through the action area along the southern side of Little Chico Creek and will be rerouted to a new bridge undercrossing. Rerouting the bike path to traverse under the proposed bridge will avoid an at-grade road crossing, thereby maintaining safety for pedestrians. The approach roadway will tie into the existing curb, gutter, and sidewalk on the north and south portions of Notre Dame Blvd. Approach roadway work will include both median and parkway landscape per City standards as well as street lighting and public utility extensions crossing the creek.

The construction of the new bridge, extensions of the existing roadway, and bike path will result in the creation of 0.78 acres of impervious surfaces within the action area. The new bridge and roadway will create 0.45 acres of impervious surfaces in addition to 0.15 acres created from sidewalks and 0.18 acres created from the rerouted bike path.

In-Channel Work

In-channel work is anticipated for one construction season from June 1 to October 15, 2025 (or June 1 to October 15, 2026 if delays occur with the expected 2025 project timeline), when the creek is expected to be dry/low flowing/disconnected. If flowing water is present in the creek during the beginning of the in-water work window of June 1 and October 15, a dewatering plan, temporary water diversion system (TWDS), and fish relocation plan will be developed and approved by NMFS prior to commencement of in-water work. These plans will include water quality monitoring and authorized fish relocation methods conducted by a qualified, NMFS-approved biologist, as well as additional avoidance and minimization measures. The TWDS will incorporate specifications for constructing, maintaining, reconstructing, and removing the TWDS and will include plans showing calculations supporting the sizing of piping, channels, pumps, discharge flow rate and anticipated velocity, so its conveyance does not cause further erosion and sedimentation and turbidity within the channel. The TWDS will additionally include locations of

diversion, including layouts, cross sections, elevations, and materials proposed for use. The estimated area to be dewatered is 0.18 acres.

Construction of the new bridge will involve in-channel work, including the excavation and construction of concrete abutments and piers (2) built on a deep, pile-driven foundation, pile driving, and placement of RSP. Construction of the bridge is expected to use impact-hammer driven pile methods, which would be driven at the bridge abutments and pier locations in the channel. Pile-driving activities are proposed to occur from July 1 to October 15, 2025 (or July 1 to October 15, 2026 if delays occur with the expected 2025 project timeline) when the creek is expected to be dry/low flowing/disconnected. If flowing water is present during the beginning of the proposed pile-driving timeframe, pile driving will be delayed until the creek is dry (i.e. dry from dewatering activities or naturally occurring) or when flows (i.e. low flowing or pooled, disconnected water) and water temperatures are unlikely suitable for any life stage of salmonid. Impact hammer pile driving is estimated to take five workdays to complete. In addition, sheet piles may be installed during the excavation phase, which would require three weeks of vibratory pile driving. The concrete piers and placement of RSP will occur in the channel and the abutments will be built outside of the channel. Temporary work within the channel includes the creation of an access route for falsework erection and removal and the installation of scour countermeasures at the support locations.

The construction of the new bridge will result in permanent impacts to 0.07 acres of riverine habitat (below the ordinary high water mark (OHWM)). This includes the construction of 0.005 acres of piers and 0.065 acres for the placement of RSP around the new piers to prevent scouring and erosion. There will additionally be 0.03 acres of temporary impacts to riverine habitat below the OHWM for temporary access roads and work areas to erect falsework and place RSP. The new bridge deck will introduce 0.072 acres of permanent shading over Little Chico Creek.

Riparian Vegetation Removal

The project will require the removal of trees and riparian vegetation within the action area. A total of six trees (≥ 4-inches DBH) including two sycamores (*Acer* sp.), three valley oaks (*Quercus lobata*), and one mulberry (*Morus* sp.) are proposed for removal in the riparian area along the bank. Additionally, the project will result in the removal of 0.17 acres of shaded riparian aquatic (SRA) vegetation. Construction activities, such as access routes, will result in temporary disturbances within the riparian area. Other existing riparian vegetation will be preserved within the action area, including a 10-inch oak tree and three additional trees.

Stormwater Runoff Management

To minimize and treat stormwater runoff from hard surfaces during construction, a stormwater pollution prevention plan (SWPPP) will be developed and implemented. SWPPP measures will incorporate best management practices (BMPs), including use of silt fences, straw bales, and other methods necessary to minimize stormwater discharge associated with construction activities. The proposed action will also comply with all water quality and discharge conditions of regulatory permits, including a National Pollution Discharge Elimination System (NPDES)

permit and Clean Water Act (CWA) Section 401 certification obtained through the Regional Water Quality Control Board (RWQCB).

To treat post-construction stormwater runoff from hard surfaces, stormwater treatment control measures have been proposed for three drainage management areas (DMA) in the action area (diagram provided in Exhibit D of the *Biological Assessment for the Notre Dame Bridge Over Little Chico Creek Project*, Gallaway Enterprises 2023). Proposed stormwater treatment control measures at North DMA will consist of a drainage area that will discharge into an existing detention pond (referred to as "Bio Cell B", with provided storage of 9,174 ft^3) located on the north side of Little Chico Creek. The hydrology conditions (post-construction) at North DMA include both the proposed Notre Dame Blvd Bridge project and future Meriam Park housing developments, which is expected to consist of 65% impervious surfaces with an average runoff coefficient of 0.65 and a 0.42 peak flow rate (ft^3/sec). Currently, two south DMAs (South DMA 1 and 2) located on the south side of Little Chico Creek will convey flows through an existing drainage ditch and culvert system, but will be reconstructed to avoid the proposed bike path. The current hydrology conditions (pre-construction) in the action area at South DMA 1 consist of 19% impervious surfaces with an average runoff coefficient of 0.54 and a 0.05 peak flow rate using the 2-year, 24-hour design value. Post-construction hydrology conditions will consist of 73% impervious surfaces, 0.44 average runoff coefficient, and a 0.07 peak flow rate. The current hydrology conditions (pre-construction) in the action area at South DMA 2 consist of 10% impervious surfaces, 0.50 average runoff coefficient, and 0.18 peak flow rate. Post-construction conditions will remain the same as pre-construction conditions. Proposed stormwater treatment control measures at South DMA 1 will consist of bioretention and rain gardens as part of a new proposed Bio Cell (provided storage of 904 ft^3). South DMA 2 will consist of existing self-treating pervious landscaping such as soils, mulch, gravel, filter fabric, and vegetated areas (provided storage of 814 ft^3). No rubberized asphalt or rubber crumb will be used for any construction element.

With respect to post-construction stormwater runoff, a net increase in peak runoff is not expected to occur as a result of the proposed action, because the project site will maintain similar pre-construction slopes along the creek, existing drainage ditches and culverts will be used and rerouted, and post-construction stormwater treatment control measures will be implemented. Routine long-term maintenance of stormwater treatment control measures will be further implemented including evaluation of planting and subsequent removal of any dead or diseased vegetation, replacing mulch prior to the wet season, removing accumulated sediment and debris regularly, and replacing soils as needed depending on pollutant loads.

1.3.2. Avoidance and Minimization Measures

Measures will be implemented to ensure impacts to Central Valley (CV) spring-run Chinook salmon (*Oncorhynchus tshawytscha*) evolutionarily significant unit (ESU), California Central Valley (CCV) steelhead (*O. mykiss*) distinct population segment (DPS), and CCV steelhead critical habitat are minimized to the greatest extent possible.

1.3.2.1 Minimization of Impacts to Anadromous Fish Species

- Work in the Little Chico Creek channel will occur when the creek is expected to be dry/low flowing/disconnected during the proposed in-water work window of June 1 and October 15. In-channel work may begin sooner than the proposed in-water work window, only when the creek is dry or when flows (i.e. low flowing or pooled, disconnected water) and water temperatures are unlikely suitable for any life stage of salmonid.
- If flowing water is present in the creek during the beginning of the in-water work window of June 1 and October 15, a dewatering plan, TWDS, and fish capture and relocation plan will be required and approved by NMFS prior to commencement of in-water work.
- Pile-driving activities will occur between July 1 and October 15 when the creek is expected to be dry/low flowing/disconnected. If flowing water is present in the creek during the beginning of the proposed pile-driving, in-water work window of July 1 to October 15, pile driving will be delayed until the creek is dry (i.e. dry from dewatering activities or naturally occurring) or when flows (i.e. low flowing or pooled, disconnected water) and water temperatures are unlikely suitable for any life stage of salmonid. Pile driving may begin sooner than the proposed in-water work window, only when the creek is dry or when flows (i.e. low flowing or pooled, disconnected water) and water temperatures are unlikely suitable for any life stage of salmonid.
- Low-intensity lighting will be used for artificial lighting in proximity to water bodies and shields will be added to light fixtures on or around the bridge to minimize temporary and permanent impacts to the river channel and listed species.
- The proposed action will comply with all terms and conditions of the regulatory permits including: CWA Section 404 Permit from the USACE, NPDES permit and CWA Section 401 certification from the RWQCB, Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW), Central Valley Flood Protection Board (CVFPB) Encroachment permit, and, if necessary, an Incidental Take Permit (ITP) 2081 from CDFW, pursuant to Section 2080 of the California Fish and Game Code.
- Rubberized asphalt concrete (i.e., crumb rubber) will not be used for any construction element to prevent further mobilization of 6PPD-quinone into fish-bearing streams..

1.3.2.2 Minimization of Impacts to Water Quality

- An erosion control plan and erosion control BMPs will be developed and implemented prior to the onset of the wet season (November 1 – April 1), in order to avoid sediment from entering the creek.
- BMPs and permanent and temporary erosion control measures will be implemented to minimize the risk of sedimentation, turbidity, and hazardous material spills including the use of straw bales, mulch or wattles, silt fences, filter fabric, and spill remediation material, such as absorbent booms.
- All fueling and/or equipment maintenance will occur 50 feet from all water bodies and riparian areas. Any hazardous material spill within the channel and surrounding riparian areas of Little Chico Creek will be reported to NMFS, CDFW, and other appropriate agencies within 24 hours.
- A spill prevention plan (SPP) and stormwater pollution prevention plan (SWPPP) will be developed and implemented. Spill prevention measures will include stockpiling absorbent

booms, staging hazardous materials at least 50 feet away from the creek, and regularly maintaining and checking construction equipment to prevent fuel and lubrication leaks. SWPPP measures will utilize BMPs, such as use of silt fences, straw bales, and other methods necessary, to minimize stormwater runoff and discharge associated with construction activities.

- The contractor will have absorbent booms available and staged within 50 feet of the channel during all in channel work to ensure quick containment of any spills within or adjacent to Little Chico Creek.

1.3.2.3 Minimization of Impacts to In-channel and Riparian Habitat

- Portions of the streambed of Little Chico Creek disturbed by construction activities will be restored to pre-construction condition.
- The banks of Little Chico Creek and all upland areas will be seeded using a native seed mix immediately following construction. Bank vegetation will be restored with fast-growing plants (such as native willow species) immediately following construction to minimize erosion and provide bank stability.
- Trees with a DBH of 4 inches or greater that are proposed for removal will be placed within the Little Chico Creek channel, where feasible, to provide large woody material (LWM) for juvenile rearing habitat.
- Plant/tree root structures will be left intact, where feasible, to minimize post-construction erosion along the banks of Little Chico Creek.
- Disturbance to the channel and banks of Little Chico Creek and/or removal of riparian vegetation will be kept to the minimum necessary to complete project activities.

1.3.3. Proposed Compensatory Mitigation/Offsetting Measures

The proposed action will result in 0.07 acres of permanent and 0.03 acres of temporary impacts to riverine habitat (below the OHWM) and will introduce 0.072 acres of permanent shading over Little Chico Creek. To compensate for the temporary and permanent impacts to riverine habitat, the project applicant has purchased riparian floodplain forest/salmonid restoration mitigation credits at a ratio of 3:1. The total acreage for temporary and permanent impacts to riverine habitat calculated is 0.17 acres and, therefore, the 3:1 mitigation credits purchased are 0.51 acres. Mitigation credits have been purchased at Fremont Landing Conservation Bank on January 3, 2024.

The removed six trees will be placed in the streambed in the action area, as feasible to provide LWM for juvenile rearing habitat. To mitigate for the loss of trees, the applicant proposes planting new, in-kind trees around the project site at a 3:1 ratio with a 5-year monitoring and management period to ensure that trees have become established and to improve long-term survival rates. Planting is expected to occur prior to project implementation in Spring 2025 (or Spring 2026 if delays occur with the expected 2025 project timeline). If temporal delays in planting will occur, an additional 1:1 ratio will be added (for each year that planting activities are delayed, post-construction).

The proposed action will additionally result in permanent impacts to 0.17 acres of SRA habitat. To compensate for the permanent impacts to SRA habitat, the project applicant proposes on-site, in-kind restoration at a 4:1 ratio with a 5-year monitoring and management period. The total restoration acreage calculated using a 4:1 mitigation ratio is 0.68 acres for SRA habitat. Restoration is expected to begin prior to project implementation in Spring 2025 (or Spring 2026 if delays occur with the expected 2025 project timeline). If temporal delays in restoration implementation will occur, an additional 1:1 ratio will be added (for each year that restoration activities are delayed, post-construction).

The proposed restoration site (i.e., Notre Dame Bridge Restoration Site) is a designated 3.03 acreage area, approximately 500 feet upstream of the action area, and is part of a larger restoration project (i.e., Little Chico Creek Restoration Project, 14.67 acres) that is proposed as mitigation for the Pomona Avenue, Salem Street, and Notre Dame Blvd bridge projects (Figure 2). At the Notre Dame Bridge Restoration Site, large native tree species will be planted to mitigate for loss of SRA habitat (e.g., Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemose*), and white alder (*Alnus rhombifolia*)). These native tree species, in addition to other native vegetation (e.g., Valley oaks (*Quercus lobata*), California blackberry (*Rubus ursinus*), coyote brush (*Baccharis pilularis*) and California buckeye (*Aesculus californica*)), will be planted within the restoration area to mitigate for loss of riparian habitat. Fast-growing riparian vegetation, such as willows, will also be planted along the banks of Little Chico Creek to provide bank establishment and enhance riparian habitat. The proposed Little Chico Creek Restoration Project is intended to create an ecologically functional and enhanced riparian corridor within the Little Chico Creek watershed that is expected to benefit CCV steelhead, CV spring-run Chinook salmon, and other native wildlife. The restoration project will include a 5-year monitoring and management period to ensure that plants have become established and to improve long-term survival rates. This will include parameters for success, corrective measures, irrigation including a schedule, and monitoring surveys. Monitoring surveys are proposed to occur quarterly in the first year following restoration implementation and annually thereafter. Monitoring surveys will consist of evaluating the survival and health of plantings, based on pre-developed success criteria.

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

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

that specifies the impact of any incidental taking and includes reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

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

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

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

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

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

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

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the PBFs that are essential for the conservation of the species.

This opinion analyzes the effects of the proposed action on the following evolutionarily significant units (ESUs) and distinct population segments (DPSs): the threatened CV spring-run Chinook salmon ESU and the threatened CCV steelhead DPS. See Table 1 for species status and Table 2 for critical habitat status.

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

Species and Recovery Plans	**Listing Classification and Federal Register Notice**	**Status Summary**
Central Valley spring-run Chinook salmon ESU Final Recovery Plan for the ESUs of SR Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead (CV salmonid recovery plan, NMFS 2014)	Threatened, 70 FR 37160; June 28, 2005	According to the NMFS previous species status review (NMFS 2016b), the status of the CV spring-run Chinook salmon ESU, until 2015, had improved since the 2010, 5-year species status review. The improved status is due to extensive restoration, and increases in spatial structure with historically extirpated populations (Battle and Clear Creeks) trending in the positive direction. Recent declines of many of the dependent populations, high pre-spawn and egg mortality during the 2012 to 2016 drought, uncertain juvenile survival during the drought are likely increasing the ESU's extinction risk (Williams et al. 2016). Monitoring data showed sharp declines in adult returns from 2014 through 2020 (CDFW 2022). Viability information since the 2015 viability assessment (SWFSC 2022) has been incorporated into the analysis of this consultation and will be reflected in an updated status review in 2024.

Species and Recovery Plans	Listing Classification and Federal Register Notice	Status Summary
California Central Valley steelhead Distinct Population Segment (DPS) CV salmonid recovery plan (NMFS 2014)	Threatened, 71 FR 834; January 5, 2006	According to the NMFS previous species status review (NMFS 2016a), the status of CCV steelhead appears to have remained unchanged since the 2011 status review that concluded that the DPS was likely to become endangered within the foreseeable future throughout all or a significant portion of its range. 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. While updated data on steelhead in the American River is mostly based on hatchery returns, natural spawning populations within the Sacramento tributaries have fluctuated, but showed a steady decline in the past 10 years (Scriven et al. 2018). Viability information since the 2015 viability assessment (Williams et al. 2016) has been incorporated into the analysis of this consultation (SWFSC 2022) and will be reflected in an updated status review in 2024.

Table 2. Description of critical habitat, designation details, and status summary.

Critical Habitat	Designation Date and Federal Register Notice	Description
California Central Valley steelhead DPS	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, 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. 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 steelhead critical habitat in the Central Valley are significantly limited and degraded, the habitat remaining is considered highly valuable.

2.2.1. Recovery Plans

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, Recovery Plan). The 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 includes 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 proposed project boundary is located between two disjunct sections of Notre Dame Blvd. over Little Chico Creek, in the eastern limits of the City of Chico, Butte County, California, and encompasses approximately 2.99 acres of Traditional Mixed Use and Primary Open Space zoned parcels. Little Chico Creek extends to the east and west beyond the project boundary. Effects to listed species and critical habitat have the potential to extend beyond the project boundary, thus, the action area extends beyond the project boundary to include these areas. The action area is 5.22 acres, which encompasses the entire project boundary and 300 feet upstream and

downstream of the boundary within Little Chico Creek to account for construction-related effects to fish migration, rearing, riparian habitat, and water quality (Figure 1).

Since the proposed action includes the purchase of mitigation credits from the Fremont Landing Conservation Bank, as well as on-site restoration, the action area also includes these areas. Fremont Landing Conservation Bank is a 100-acre site along the Sacramento River at river mile 80 that provides riparian, wetland, and open-water habitat. For the on-site restoration area, the action area is defined as the proposed restoration site (i.e., Notre Dame Bridge Restoration Site) which is a designated 3.03 acreage area, approximately 500 feet upstream of the project boundary (Figure 2).

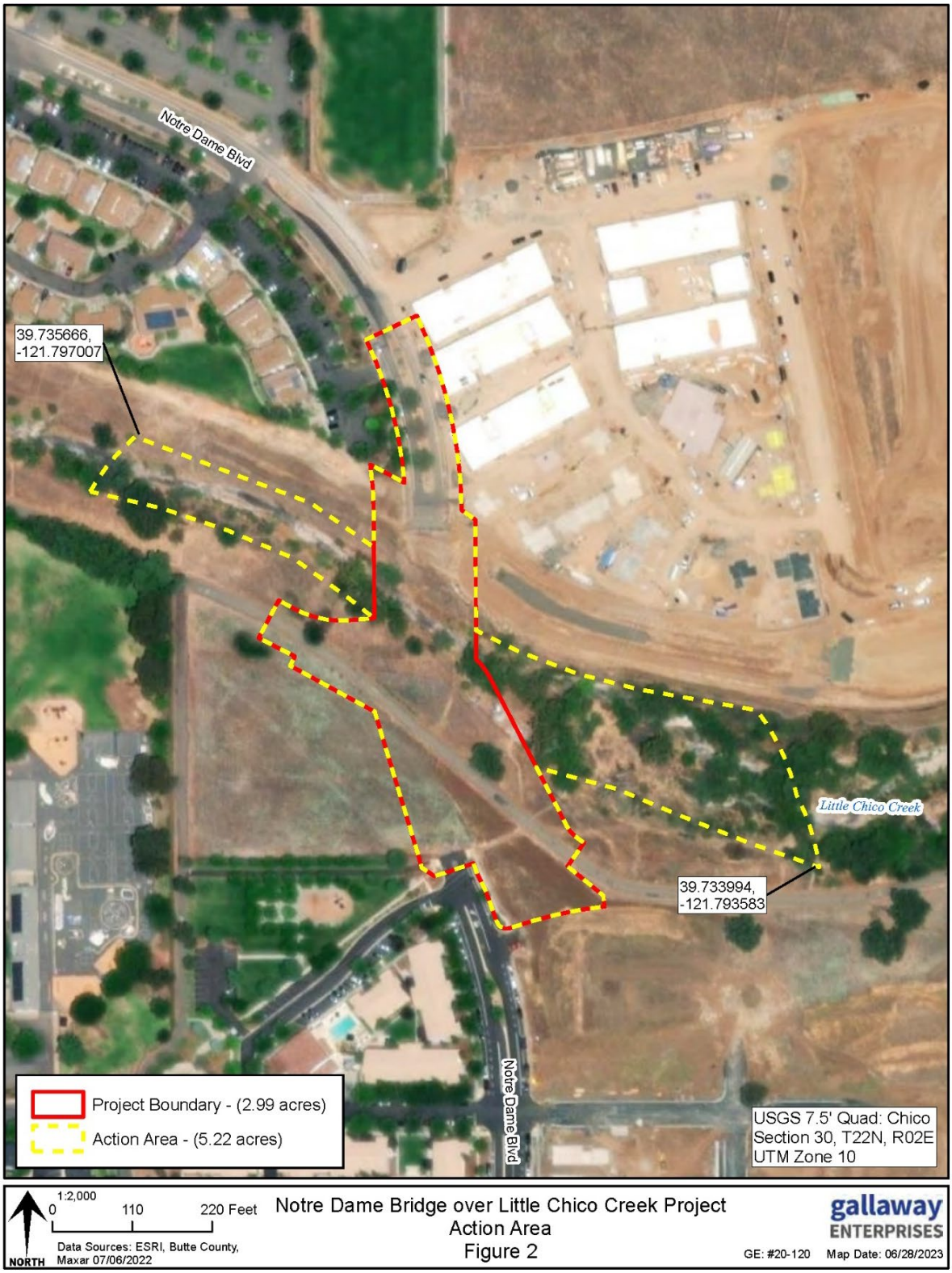

Figure 1: Action Area

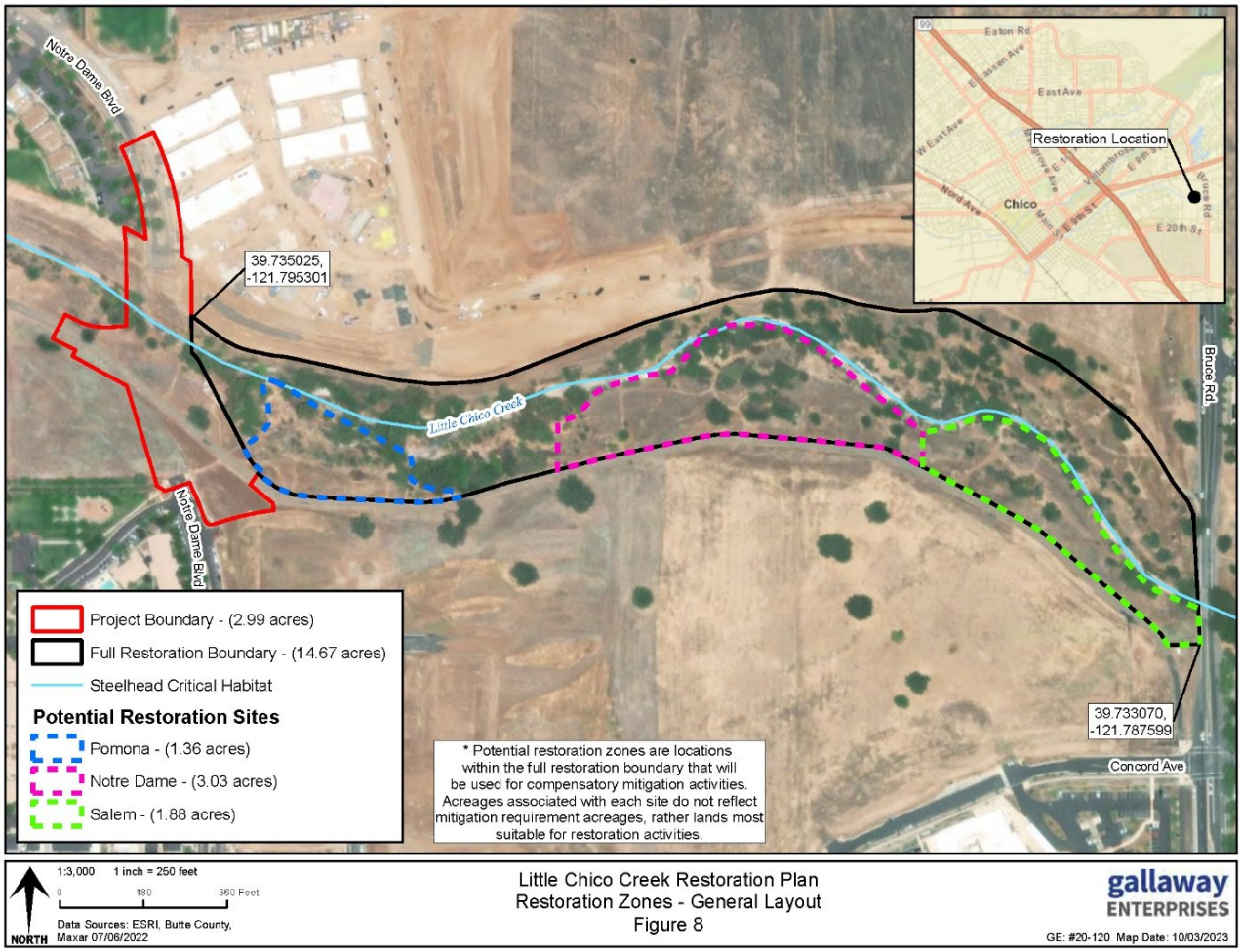

Figure 2: Little Chico Creek Restoration Project site

2.4. Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

The action area and adjacent land consist of an intermittent drainage, urban development, including residential and commercial development, agricultural areas, and various habitat types (riverine, lacustrine, valley foothill riparian, annual grassland, urban, and barren). The immediate area surrounding the action area is heavily influenced by human development and the proposed project occurs within the greater Meriam Park Development Project, which is in various stages

of completion. Agricultural areas primarily occur further downstream of the action area (west of the City of Chico, within the agricultural zone). Channel banks along various reaches of Little Chico Creek, in both the urban and agricultural zone, have been armored with riprap to prevent lateral channel migration. Numerous bridges over Little Chico Creek exist throughout the urban zone. These channel modifications and upstream flow diversions have constrained lateral channel migration from natural processes (CSUC 2002).

Little Chico Creek is an intermittent creek, flowing east to west through the action area, and is a tributary to Angel Slough. Angel Slough is a tributary to Butte Creek and the Sacramento River, respectively. Little Chico Creek is situated between two major salmon streams (Big Chico Creek and Butte Creek) and flows into a wetland complex (Rancho Llano Secco) of the Sacramento River National Wildlife Refuge. Little Chico Creek is located within the Butte Creek watershed. Watershed surveys conducted within Little Chico Creek have identified four different zones of the creek: the mountain zone, canyon zone, urban zone, and agricultural zone (CSUC 2002). The action area is located on the eastern edge of the urban zone of Little Chico Creek, which is generally where the creek changes from a perennial stream to an intermittent stream. During the dry season, the creek in the mountain and canyon zones (miles upstream of the action area) is fed by numerous small springs in the mountains and foothills, keeping a small baseflow; however, once reaching the valley floor, the baseflow is quickly lost to infiltration, evaporation, or human extraction (CSUC 2002). The agricultural zone is located on the valley floor. Within the action area, Little Chico Creek conveys water during the winter and spring months (primarily from rain and snowmelt runoff) and is usually dry during the summer and fall; however, flows within Little Chico Creek in the action area may exist into summer in high flow years.

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

The action area, which encompasses Little Chico Creek and associated riparian areas at and adjacent to the project site, functions primarily as rearing and migratory habitat for CCV steelhead. Although the action area is not designated critical habitat for CV spring-run Chinook salmon, it is possible for one or more of the following life stages to be present within the action area throughout the year: adult migrants, rearing juveniles, or emigrating juveniles. CV spring-run Chinook salmon may use the creek for non-natal rearing in the lower reaches (CDFW 2023) and have been observed within portions of Little Chico Creek during high flow years (CSUC 2002); however, this watershed is not typically used as a migration corridor, spawning or rearing habitat for CV spring-run Chinook salmon.

Designated critical habitat occurs in the action area for CCV steelhead. Between late fall and early summer (November 1 – June 30), Little Chico Creek within the action area contains the following PBFs: 1) freshwater migration corridor, and 2) freshwater rearing sites for CCV steelhead. These PBFs within the designated critical habitat provide adult migration and juvenile refuge, mobility and survival, and are essential to the conservation of CCV steelhead. The essential features of these PBFs include water quality and forage, water quantity, water temperature, riparian habitat, natural cover, and access to and from spawning grounds. The intended conservation roles of habitat in the action area are to provide appropriate freshwater rearing and migration conditions for juveniles and unimpeded freshwater migration conditions for adults. CCV steelhead have been known to spawn upstream of the action area in the upper reaches of Little Chico Creek; however, there is currently no spawning potential for either

species in the action area (CSUC 2002). During the summer months (July 1 – October 15), the intermittent hydrology, stagnant water, and warm temperatures make Little Chico Creek within the action area unsuitable for any lifestage of anadromous salmonid (CDFW 2018).

The intended conservation roles of habitat in the action area are to provide appropriate freshwater rearing and migration conditions for CCV steelhead juveniles and unimpeded freshwater migration for adults. However, the conservation condition and function of this habitat have been severely impaired by various factors. The result has been the reduction in quantity and quality of several essential features of habitat required by salmonids to grow and survive. Despite the degraded condition of habitat within the action area, its intrinsic value remains high for the conservation of federally listed fish species in the Central Valley.

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

Little Chico Creek is an intermittent tributary within the Butte Creek watershed, which flows east to west within the action area. Physical features of the creek in the action area include a mixed cobble bottom, valley-foothill and annual grassland vegetation in and around the channel, and relatively dense large tree canopy above the channel. Once it leaves the action area, Little Chico Creek flows west through the city of Chico, and then south several miles before entering Angel Slough and the Rancho Llano Secco wetland complex, eventually feeding into the Sacramento River. In this area, the boundaries of the creek are difficult to delineate due to agricultural land use modifying surface drainage patterns. Little Chico Creek splits into a series of smaller channels, many of which are silted in making migration from the Sacramento River to upper reaches of Little Chico Creek difficult in low flow years. Although the upper reaches of Little Chico Creek contain perennial flows, lower reaches from the city of Chico through the agricultural zone are considered intermittent with some portions completely dry in the summer months.

Little Chico Creek has been degraded from its historic condition and many anthropomorphic and naturally occurring factors have led to the decline of anadromous fish in the surrounding ecosystem. While the lower valley reaches provide seasonal habitat for migratory anadromous fish, dams and weirs constructed to divert water for flood control or irrigation prevent migratory anadromous fish species from accessing this habitat.

Due to urban development in the reach of Little Chico Creek that runs through the city of Chico (within and west of the action area), as well as agricultural development in the lower reach (downstream of the action area) there has been alteration to the natural and historic flows, and temperatures through the action area. In a report evaluating watershed conditions in Little Chico Creek (CSUC 2002), groundwater pumping in the urban area of the city of Chico is noted as the primary source of drinking and urban irrigation water. The report further summarized "…Extraction of groundwater from deeper aquifers can influence and lower water levels in the shallowest unconfined aquifer immediately connected to Little Chico Creek. Although no studies have been performed of surface and groundwater interactions in the LCCW [Little Chico Creek watershed], the loss of perennial flow in the urban reaches of Little Chico Creek may be related to groundwater development." Altered flow regimes can influence migratory cues, water quality (including contaminants, dissolved oxygen, and nutrients for primary productivity), sedimentation, and water temperature. Urbanization has also 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 and impact anadromous fish and habitat functions.

As previously noted, channel banks along various reaches of Little Chico Creek have been modified and armored with riprap, which has contributed to constrained lateral channel migration from natural processes (CSUC 2002) and the loss of riparian habitats. Riparian vegetation provides a large host of ecosystem services and its removal in urban and agricultural areas has diminished habitat value within the action area. Riparian vegetation plays a key role in the conservation value of rearing habitat for all salmonid life stages. It provides shade to lower stream temperatures, increases the recruitment of large woody material into the river, thereby increasing habitat complexity, provides shelter from predators, and enhances 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 (Schlosser and Karr 1981, Dosskey et al. 2010).

Surveys done by California State University, Chico (CSUC 2002) report the main channel as disconnected from the floodplain and the riparian corridor in the urban zone consisting of non-native grassland, riparian forest, and riparian scrub with 48% of the species composition being introduced plant species. Structural diversity was also reported as less than that found in the mountain and canyon zones (east of the urban zone in the upper reaches), with riparian areas often consisting of only 1-2 layers. The importance of riparian zones to aquatic ecosystems is well recognized (e.g., Naiman and Decamps 1997) and one of the main stressors to listed fish species and habitat in the Central Valley is widespread loss and degradation of habitat, including riparian and floodplain habitat. The NMFS Recovery Plan (NMFS 2014) notes that functioning, diverse, and interconnected habitats are necessary for a species to be viable. That is, salmon and steelhead recovery cannot be achieved without providing sufficient habitat. Thus, restoring, protecting, and maintaining riparian habitat and interconnected ecosystems in watersheds throughout the Central Valley is necessary for the recovery of federally listed fish species.

Introduction of non-native species and predation on juveniles rearing and migrating through Little Chico Creek impacts species from all populations. CSUC (2002) reported that approximately six introduced fish species and 17 introduced wildlife species are known or expected to occur within the Little Chico Creek watershed. While little is known about the extent of impact of non-native species introduction, many of these non-native species are known to compete with and prey upon native fish species.

2.4.3. Climate Change

One major factor affecting 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). An altered seasonality results in runoff events occurring earlier in the year due to a shift in precipitation falling as rain rather than snow (Roos 1991, Dettinger et al. 2004).

Projected warming due to climate change is expected to affect Central Valley Chinook salmon. Because the runs are restricted to low elevations as a result of impassable rim dams, if temperatures rise by 5°C (9°F), it is questionable whether any Central Valley Chinook salmon populations can persist (Williams 2006). Based on an analysis of an ensemble of climate models and emission scenarios and a reference temperature from 1951- 1980, the most plausible projection for warming over Northern California is 2.5°C (4.5°F) by 2050 and 5°C by 2100, with a modest decrease in precipitation (Dettinger 2005). Chinook salmon in the Central Valley are at the southern limit of their range, and warming will shorten the period in which the low elevation habitats used by naturally- producing fall-run Chinook salmon are thermally acceptable. This would particularly affect fish that emigrate as fingerlings, mainly in May and June, and especially those in the San Joaquin River and its tributaries.

CV spring-run Chinook salmon adults are vulnerable to climate change, because they over-summer in freshwater streams before spawning in autumn (Thompson et al. 2011). CV spring-run Chinook salmon spawn primarily in the tributaries to the Sacramento River, and those tributaries without cold water refugia, usually provided by springs, will be more susceptible to impacts of climate change. In years of extended drought and warming water temperatures, unsuitable conditions may occur even in tributaries with cool water springs. Additionally, juveniles often rear in the natal stream for one to two summers prior to emigrating and would be susceptible to warming water temperatures.

Although steelhead will experience similar effects of climate change to Chinook salmon, as they are also blocked from the vast majority of their historic spawning and rearing habitat, the effects may be even greater in some cases, as juvenile 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 steelhead, which range from 14°C to 19°C (57°F to 66°F). Several studies have found that steelhead require colder water temperatures for spawning and embryo incubation than salmon (McCullough et al. 2001).

Stream flow is a highly important variable and driving mechanism in fluvial ecosystems and climate has been identified as a landscape-scale driver of flow rates (Minshall 1988). Multiple climatological and hydrologic model predictions indicate that flows in the Central Valley will decrease throughout the 21st century as warming trends continue. In addition to altered flow regimes, some other aspects of stream systems that are particularly sensitive to changes in climate are sediment transport/channel alterations, nutrient loading and rates of nutrient cycling, fragmentation and isolation of cold-water habitats, altered exchanges with the riparian zone and life history characteristics of many aquatic insects (Meyer et al. 1999). Current warming trends and model predictions indicate that it is likely that climate change will result in some direct and indirect adverse effects to salmonids in the Central Valley in the 21st century.

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).

2.4.4. Species Survival and Recovery in the Action Area

Little Chico Creek contains migratory and rearing habitat for CV spring-run Chinook salmon and CCV steelhead in the lower reaches of the creek and CCV steelhead spawning habitat in the upper reaches. The portion of Little Chico Creek within the action area contains rearing and migration corridor PBFs for CCV steelhead.

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 of California Central Valley steelhead (NMFS 2014) includes recovery criteria (species down/delisting) and diversity group priorities. The Recovery Plan, however, does not describe listed species in Little Chico Creek as belonging to a "Core" population, meaning listed species in this watershed do not have a high potential to support a viable population with low risk of extinction and are not a priority for recovery actions.

2.5. Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action (see 50 CFR 402.02). A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered the factors set forth in 50 CFR 402.17(a) and (b).

2.5.1. Effects of the Proposed Action to Listed Fish Species

The effects of the proposed action are based on best available life history information and monitoring data on the two species whose geographical range occurs in the action area. Life stages of species that are expected to be present during the proposed in-water work window (June 1 to October 15) include juvenile CCV steelhead and potentially adult CV spring-run Chinook salmon. Life stages of species that are expected to be present during the construction period (March to November) include juvenile and adult CCV steelhead and juvenile and adult CV spring-run Chinook salmon. In this section of Little Chico Creek where the proposed action will occur, there are no known spawning areas for salmonids, so impacts or mortality to eggs and fry are not expected to occur. The following analysis includes potential pathways of effects to the species resulting from the proposed action.

Dewatering and Fish Relocation

In-channel work is expected to occur between June 1 and October 15 when Little Chico Creek is expected to be dry/low flowing/disconnected. If flowing water is present in the creek during the beginning of the in-water work timeframe, a dewatering plan, temporary water diversion system (TWDS), water quality monitoring, and fish relocation plan will be required and approved by

NMFS prior to commencement of in-water work. Because juvenile CCV steelhead and adult CV spring-run may be present in the action area if flowing water is present, fish capture and relocation may be necessary during implementation of a TWDS and dewatering activities. Fish relocation activities pose a risk of injury or mortality to listed fish species since fish relocation and collection gear in general has some associated risk including stress, disease transmission, injury, death, and increased susceptibility to predation.

While adult CV spring-run Chinook salmon and juvenile CCV steelhead may occur in the action area during in-water work, we expect minimal occurrence of individuals in the system due to the timing of in-water work activities (i.e., work will not occur during peak migrations and when water conditions minimize, if not preclude, fish presence). Thus, the potential capture and relocation of listed fish species associated with dewatering activities is expected to adversely affect a small number of adult CV spring-run Chinook salmon and juvenile CCV steelhead present in the action area. Adult CCV steelhead are not expected to be present during relocation, thus, impacts to this life stage are not expected to occur.

Increased Sedimentation and Turbidity

Increased sedimentation and turbidity in Little Chico Creek may result from a number of sources associated with the proposed action. Site clearing, earthwork/excavation, construction, vegetation removal and planting, pile-driving activities, and placement of RSP will result in disturbance of soil and riverbed sediments and therefore temporary increases in turbidity and suspended sediments. Additionally, installation of a TWDS and dewatering activities could result in temporary increases in turbidity and suspended sediments in the river, if water from the dewatered area is not properly disposed of or contained and treated before discharge back to the river. Post-construction, NMFS anticipates disturbed soils could affect water quality in the action area from subsequent higher flow events during the first winter storms post-construction. Disturbed soils on the creek bank are easily mobilized when late fall and winter storms increase streamflow levels. Instream and near-stream construction activities have been shown to result in temporary increases in turbidity (reviewed in Furniss et al. 1991, Reeves et al. 1991, Spence et al. 1996).

An increase in water turbidity and/or suspended sediments could cause injury or mortality to all species and life stages, if concentrations were at elevated levels for an extended period of time and fish were present. 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, Gregory 1993, Newcombe and Jensen 1996, Kemp et al. 2011). Salmonids have been observed to move laterally or downstream to avoid turbidity plumes, causing a disruption to their normal feeding or other behaviors (Sigler et al. 1984). Temporary spikes in suspended sediment may result in behavioral avoidance of the action area 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). Salmonids exposed to slight to moderate increases in turbidity have been shown to exhibit avoidance, loss of station in the stream, reduced feeding rates, and

reduced use of overhead cover (Lloyd 1987). Short-term increases in turbidity and suspended sediment may disrupt feeding activities of fish or result in temporary displacement from preferred habitats.

In-channel work will be conducted between June 1 and October 15 when the creek is expected to be dry/low flowing/disconnected, thus avoiding sedimentation and turbidity associated with in-channel disturbances. If flowing water is present and installation of a TWDS and dewatering activities will occur, creek flows are expected to be low or stagnant, thus minimizing turbidity and sedimentation impacts to fish. Additionally, pile-driving activities will be conducted between July 1 and October 15 and, if flowing water is present during the beginning of the proposed pile-driving in-water work window, pile driving will be delayed until the creek is dry (i.e. dry from dewatering activities or naturally occurring) or when flows (i.e. low flowing or pooled, disconnected water) and water temperatures are unlikely suitable for any life stage of salmonid. Any increases in turbidity associated with proposed instream work is likely to be temporary, localized, and attenuate quickly downstream as suspended sediment settles out of the water column.

While chronic elevated sediment and turbidity levels can affect listed species, sedimentation and turbidity levels associated with this project during subsequent rainfall events post-construction are not expected to rise to harmful levels, because the project proposes soil stabilization measures to minimize the mobilization of sediment. Due to the project's proposed use of erosion control measures throughout the construction and post-construction phase, and post-construction planting of native vegetation, NMFS anticipates there will be minimal area of disturbed, exposed soils remaining post-construction. Therefore, any resulting elevated turbidity levels would be small, only occur for a short period, and be well below levels and durations shown in the scientific literature as causing injury or harm to salmonids (e.g., Sigler et al. 1984 or Newcombe and Jensen 1996). Thus, impacts to listed fish species resulting from sedimentation and turbidity are expected to be minor.

Stormwater Runoff

The proposed action includes the construction of new impervious surfaces (0.78 acres), including a bridge and associated sidewalks, extensions of existing roadways, and a rerouted bike path. Stormwater runoff and associated pollutants has the potential to occur as a result of the new impervious surfaces during construction and post-construction. Pollutants in untreated post-construction runoff are expected to include oil, grease, polycyclic aromatic hydrocarbons (PAH), heavy metals (copper, zinc, etc.) and other toxic substances associated with tires and vehicles. Published work has identified stormwater from roadways and streets as causing a high percentage of rapid mortality of adult and juvenile coho salmon (Scholz et al. 2011, McIntyre et al. 2015, 2018, Chow et al. 2019) with mortality or symptoms of exposure noticeable for hours. Subsequent examinations documented impacts to steelhead, also within a few hours (Brinkmann et al. 2022, French et al. 2022), and neither species recovered when transferred to clean water (Chow et al. 2019, French et al. 2022). Effects appear to be related to cardiorespiratory disruption, consistent with symptoms (surface swimming and gaping followed by loss of equilibrium (Scholz et al. 2011)) and therefore sublethal effects, such as disruption of behaviors needed for survival (e.g., swimming performance and predator avoidance), are expected. The

highest concentration levels of constituents and chemical mixtures that are toxic to fish and aquatic life in stormwater runoff are expected to occur at the point of discharge. First-flush rain events after long antecedent dry periods (periods of no rain) will also have higher concentrations of pollutants although many developed areas exhibit elevated pollutant levels throughout storm systems due to the continued mobilization of contaminant mass across the entire storm hydrograph (i.e., the contaminant load is not mass limited due to traffic volumes, but its transport may be limited by the size of the storm) (Peter et al. 2020, Feist et al. 2017).

Stormwater runoff can be effectively treated by infiltrating the road runoff through soil media containing organic matter, which results in removal of toxins and contaminants (McIntyre et al. 2015, Spromberg 2016, Fardel et al. 2020). Unlike traditional stormwater collection and conveyance practices, such as storm drain systems with direct outfalls to waterways, vegetated filter strips at the edges of paved surfaces or vegetated swales (i.e., bioswales) can collect and convey stormwater in ways that infiltrate into soils with large amounts of organic matter that bind or otherwise remove contaminants from the stormwater before it reaches a stream (McIntyre et al. 2015).

Within the action area, stormwater runoff will likely occur during the rainy season from October through May. The proposed project will comply with all water quality and discharge conditions of regulatory permits and includes BMPs and a SWPPP during construction to minimize stormwater discharge impacts during construction. The proposed project design also includes post-construction stormwater measures that consist of treating discharge into an existing detention pond (i.e., discharge is infiltrated through a bioretention soil mix) in the North DMA and a combination of bioretention, rain gardens, and existing self-treating pervious landscaping, such as soils, mulch, gravel, filter fabric, and vegetated areas in the South DMAs. No rubberized asphalt or rubber crumb will be used in any construction element, which will further minimize the toxic and lethal effects of 6PPD-quinone on listed species (Tian et al. 2021). CCV steelhead and CV spring-run Chinook salmon are expected to be present during part of the construction period (outside of the June 1 – October 15 in-water work window), as well as post-construction, and would potentially be affected by pollutants associated with stormwater runoff. However, due to the avoidance of rubberized asphalt for construction and implementation of stormwater treatment measures noted above during construction and post-construction, the effects of stormwater pollution are expected to be minimal.

Contaminants and Pollution-related Effects

The proposed action would involve heavy construction equipment and activities that could impair water quality, if a contaminant discharge were to occur during the construction period. Potential sources of pollutants include fuel, lubricants, and hydraulic fluid. A leak 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. Heavy equipment and machinery will be present in the action area, and metals may be deposited through their use and operation (Paul and Meyer 2008). 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 have the potential to directly or indirectly affect CV spring-run Chinook salmon and CCV steelhead that may be migrating or rearing in the action area at the time of a pollution event or possibly afterwards. Potential 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. Contaminant materials from construction equipment have been shown to alter juvenile salmonid behavior through disruptions to various physiological mechanisms, including sensory disruption, endocrine disruption, neurological dysfunction, and metabolic disruption (Scott and Sloman 2004). Oil-based products used in combustion engines are known to contain polycyclic aromatic hydrocarbon (PAHs), which have been known to bio-accumulate in other fish taxa, such as flatfishes (order Pleuronectiformes), and have carcinogenic, mutagenic, and cytotoxic effects (Johnson et al. 2002). The exact toxicological effects of PAHs in juvenile salmonids are not well understood, although studies have shown that increased exposure of salmonids to PAHs reduces immunosuppression, increasing their susceptibility to pathogens (Arkoosh et al. 1998, Arkoosh and Collier 2002). A potential indirect effect of contamination is reduced prey availability (invertebrate prey survival could be reduced following exposure), making food less available for fish (Kidd et al. 2014). Fish consuming affected prey may also absorb toxins indirectly (Laetz et al. 2009).

Low numbers of CCV steelhead and CV spring-run are expected to be present in the action area during construction activities and would likely be exposed if a pollution event occurred. Likelihood of potential exposure to contaminants during the construction period will be avoided with the proposed avoidance and minimization measures (listed in Section 1.3.2). Thus, exposure of listed species to contaminants are not expected to occur.

Hydroacoustic Effects

Construction of the new bridge will require pile driving for temporary and permanent piles. Sound generated by impact pile driving has the potential to affect listed fish in several ways, including: behavior alteration, physical injury, and mortality depending on the intensity and characteristics of the sound, the distance and location of fish in the water column relative to the sound source, the size and mass of fish present, and the anatomical characteristics of the fish present (Caltrans 2020). The most common form of acute injury to fish resulting from impact pile driving is barotrauma to the fish's swim bladder. When sound propagates through the water, tissues of the swim bladder may become ruptured or torn as the sound wave passes through the fish and pressure levels rapidly rise and fall, causing the swim bladder to expand and contract. Internal organs adjacent to the swim bladder may be injured as well (Gaspin 1975). Salmonids have physostomous swim bladders that may become injured in this way. Other injuries have been documented as well, including structural damage to auditory organs (Enger 1981, Hastings 1995, Hastings et al. 1996) causing equilibrium problems (Hastings 1995, Hastings et al. 1996). Physical injury can reduce the fitness of salmonids through temporary or permanent impairment of natural behaviors and any alteration in behavior or physical injury can increase the chance of predation due to disorientation, the ability to feed, or migrate. Vibratory pile driving generally stays below injurious thresholds (Caltrans 2020) and only behavioral effects are expected to occur, such as avoidance.

Impact pile driving and vibratory pile driving will be required in the channel for the installation of two concrete piles for the bridge abutments, as well as the temporary falsework. Pile driving activities will occur between July 1 and October 15 when the creek is expected to be dry/low flowing/disconnected. If flowing water is present during the beginning of this timeframe, pile driving will be delayed until the creek is dry (i.e. dry from dewatering activities or naturally occurring) or when flows (i.e. low flowing or pooled, disconnected water) and creek conditions are unlikely suitable for any life stage of salmonid. Thus, hydroacoustic effects to listed species are expected to be minimal.

Construction-related Effects

Construction-related activities have the potential to result in injury or death to listed fish species. Construction-related effects may include debris falling into the active channel, tools and/or equipment falling into the active channel, or noise generated by displaced rock and sediment and the operation of construction machinery outside of the channel. Both adult and juvenile life stages of CCV steelhead and CV spring-run Chinook salmon can potentially utilize the action area as a migration corridor and for rearing. CCV steelhead and CV spring-run Chinook salmon that may migrate through or rear in the action area during the scheduled construction period (March to November) may be exposed to short-term noise and disturbance caused by construction activities. For juveniles, these disturbances may cause stress from displacement from their rearing area and relocation to a new rearing area. Subsequently, juveniles may experience crowding and competition with resident fish for food and habitat, which can lead to reduced growth. Juveniles may additionally be subject to increased predation risk while relocating to new rearing areas, leading to reduced survival.

A small number of listed species may be present in the action area and individuals migrating or rearing in the action area may be exposed to short-term, intermittent construction-related noise and disturbances, causing individuals to be temporarily displaced. However, NMFS expects that displaced adult and juvenile fish will likely relocate to areas upstream or downstream that have suitable habitat. Additionally, avoidance and minimization measures, including conducting in-channel construction activities when the creek is expected to be dry/low flowing/disconnected and fish will be absent (June 1 to October 15), will be implemented to further minimize the probability and severity of construction-related effects in the action area. Therefore, construction-related effects are expected to be minor and unlikely to result in harassment, injury, or death.

2.5.2. Effects of the Proposed Action to Critical Habitat and PBFs

The proposed action is expected to have short- and long-term effects on habitat quantity and quality, including effects on the PBFs of designated critical habitat of CCV steelhead. PBFs that occur within the action area are (1) freshwater rearing sites and (2) freshwater migration corridors. There is potential for degradation of PBFs resulting from riparian and riverine habitat loss, permanent shading, lighting, and water quality impacts from the proposed action.

Shaded Riverine Aquatic (SRA) Habitat and Riparian Habitat Loss

Clearing of the existing riparian forest vegetation (i.e., SRA habitat) within the proposed project boundary will result in permanent loss of 0.17 acres of SRA habitat within the action area. The permanent loss of existing SRA habitat would result from activities related to construction of the bridge, piers, abutments, and the bikeway that would pass under the south side of the bridge structure. An additional six trees (≥ 4-inches DBH) including two sycamores (*Acer* sp.), three valley oaks (*Quercus lobata*), and one mulberry (*Morus* sp.) are proposed for removal within the riparian area.

Riparian vegetation plays a key ecological role in the conservation value of rearing habitat for many salmonid life stages. It provides shading to reduce stream temperatures, increases the recruitment of large woody material into the river that increases habitat complexity, provides shelter from predators, enhances the productivity of aquatic macroinvertebrates (Anderson and Sedell 1979, Pusey and Arthington 2003), and provides high-value feeding areas as river productivity is increased at all trophic levels by the allochthonous materials and energy input from terrestrial vegetation (USFWS 1992). 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 permanent loss of 0.17 acres of SRA habitat and riparian tree removal will result in the degradation of migratory corridors and rearing habitat PBFs for CCV steelhead.

As described in Section 1.3.3, onsite, in-kind restoration and tree planting is proposed to mitigate for permanent impacts to SRA habitat and the removal of trees. For the removal of six trees (≥ 4-inches DBH), the project applicant proposes planting new, in-kind native trees around the project site at a 3:1 ratio with a 5-year monitoring and management period to ensure that trees have become established and to improve long-term survival rates. The removed trees will be placed in the streambed in the action area to provide LWM for juvenile rearing habitat. For the loss of SRA habitat, the project applicant proposes onsite, in-kind restoration at a 4:1 ratio with a 5-year monitoring and management period. Areas disturbed by construction activities in the action area, including sites where trees and shrubs have been removed, will be revegetated using appropriate native riparian species and fast-growing vegetation immediately upon completion of the project. Other areas of disturbed or removed vegetation on access routes and along the bank will be re-seeded to promote natural recruitment of native vegetation.

With respect to the degradation of streams and riparian areas and restoration efforts to restore the ecological function of riparian areas, there is general uncertainty about how rapidly various key attributes, such as water quality, will recover (Davies-Colley et al 2009). Shading and thermal recovery is likely to take several decades, depending on both the height and density of riparian vegetation and stream size (channel width) (Rutherford et al. 1999). Recovery of the stream wood regime, particularly recruitment of large logs that are disproportionately important in "structuring" the channel, depends on riparian forest development and can take many decades to centuries (e.g., Meleason & Hall 2005). However, active placement of wood in channels (e.g., as reviewed by Kail et al 2007) may be valuable in accelerating the recovery of streams. Using simulation modelling, Davies-Colley et al (2009) similarly found that the recovery of stream shade and temperature was expected to occur within decades, but was accelerated by deliberate planting. Recovery was also found to be fastest in small streams in which thermal stress from

sunlight exposure was greatest. For the proposed project, areas replanted and reseeded with fast growing riparian species are expected to recover within the short-term (e.g., 2-5 years). With the proposed restoration and monitoring plan, as well as placement of removed trees in the channel, recovery of the ecological function of SRA habitat and trees within the action area with restoration is expected to also occur within the short-term (e.g., 5-10 years).

Removal of riparian vegetation and SRA habitat has the potential to affect Little Chico Creek with increased exposure to solar radiation and reduced invertebrate prey input from terrestrial sources. Therefore, NMFS expects temporary impacts to PBFs of critical habitat associated with foraging and water quality due to riparian vegetation removal within the action area. Due to the small area subject to riparian vegetation removal (0.17 acres of SRA habitat and six trees at ≥ 4-inches DBH) and the proposed revegetation and restoration plan, the proposed action is not expected to have an appreciable effect on critical habitat PBFs associated with stream shading, cover, water temperature, or nutrient input in the action area. Thus, long-term impacts to critical habitat due to riparian habitat removal are expected to be minimal.

Freshwater Migratory Corridor and Rearing Habitat Loss and Overwater Shading

Safe and unobstructed migratory pathways are necessary for adult salmonids to migrate to and from spawning habitats and for juveniles to migrate downstream from spawning/rearing habitats within freshwater rivers to rearing habitats within the estuaries. In-channel construction is expected to occur when Little Chico Creek is expected to be dry and the main migratory corridor in the creek will not be blocked at any time during project implementation. Thus, CCV steelhead using the area to migrate upstream and downstream in the action area to feed or rest, should not be affected during the construction period and project effects on the PBFs of migratory corridors is expected to be minor. Fish that use the action area as a migratory corridor will be able to continue using the channel during and after the proposed action.

Freshwater rearing habitat provides water quantity, quality, and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility. Rearing habitat condition is strongly affected by habitat complexity, food supply, and presence of predators of juvenile salmonids. Freshwater rearing habitats have a high intrinsic value to salmonids, as the juvenile life stages are dependent on the function of this habitat for successful survival and recruitment. Within the channel, the construction of two concrete piers, placement of RSP, and the construction of temporary access routes and work areas will result in permanent (0.07 acres) and temporary impacts (0.03 acres) to riverine habitat and rearing habitat PBFs. Juvenile salmonids are significantly less likely to be found in riprap (i.e., RSP) habitats versus unaltered habitats (Garland et al. 2002).

Placement of RSP and piers in the channel is expected to adversely affect the quantity and quality of freshwater migratory and rearing habitat PBFs for juvenile CCV steelhead and reduce the amount of usable rearing habitat. Instream rock placement will cause impacts to rearing habitat quality from reduced abundance of benthic aquatic macroinvertebrates within the footprint of the repairs, due to the placement of rock over the existing streambed. Increased sediment size also creates more habitat for predators to hide and ambush prey from, causing an increase in juvenile predation. These effects to aquatic macroinvertebrates are expected to be

long-term as permanent bank armoring alters the natural streambed (USFWS 2004). The amount of food available for adult and juvenile CCV steelhead in the action area is therefore expected to be permanently decreased where submerged RSP and piers are placed. Because areas disturbed by temporary construction activities will be restored to pre-construction conditions upon completion of the project, temporary impacts are expected to be minimal.

The proposed action will also introduce 0.072 acres of permanent shading (new bridge deck) over Little Chico Creek where no over-water structure currently exists. Overwater structures can alter underwater light conditions and provide potential holding conditions for juvenile and adult fish, including species that prey on juvenile listed fishes. Overwater structures can additionally result in a reduction in shaded riparian habitat cover which provides shelter for juvenile listed fish from predators, leaving juveniles vulnerable to predation. The increase in riverine shading may result in associated riparian vegetation receiving less sunlight for photosynthesis, as well as in-water vegetation receiving less light for photosynthesis. This can result in decreased fish habitat quality and decreased insect productivity (Pincetich 2019). Thus, permanent shading is expected to degrade the PBFs of migratory corridors and rearing habitat by increasing the risk of predation and reducing primary productivity.

To compensate for the temporary and permanent impacts to riverine habitat, the project applicant purchased riparian floodplain forest/salmonid restoration mitigation credits at a ratio of 3:1 at Fremont Landing Conservation Bank. The total acreage for temporary impacts (0.030 acres) and permanent impacts (0.142 acres) to riverine habitat calculated is 0.17 acres and, therefore, the 3:1 mitigation credits purchased are 0.51 acres.

Water Quality Effects

As discussed above in section 2.5.1 of this opinion, untreated stormwater runoff during construction and post-construction from impervious surfaces has the potential to result in adverse effects through the discharge of contaminants to Little Chico Creek. Oil, grease, PAHs, and other chemicals associated with tires and vehicles that are toxic to fish and aquatic life can impact PBFs of critical habitat in the form of degraded water quality and reduced prey. During construction, leaks or discharge from heavy equipment and construction activities could result in the introduction of heavy metals, nutrients, hydrocarbons, or synthetic compounds, which could impair water quality and cause increased temperatures, disease susceptibility, or algal blooming. Additionally, increased sedimentation and turbidity in Little Chico Creek may result from a number of sources (outlined in section 2.5.1) associated with the proposed action and effects of increased turbidity and sedimentation in critical habitat are similar to those described for species.

However, given the in-water work window, avoidance of rubberized asphalt use, implementation of stormwater treatment measures during construction and post-construction (as outlined in section 2.5.1), and proposed avoidance and minimization measures and BMPs, the impacts of stormwater runoff, pollutants, and increased sedimentation and turbidity to critical habitat PBFs are expected to be minimal.

Lighting

The design of the new bridge includes the permanent installation of night lighting. Night lighting has the potential to result in permanent adverse effects to rearing and migration critical habitat PBFs. Night lights can shine onto waters during nighttime hours and may facilitate increased predation on juvenile listed fish by predatory fish, birds, and mammals (Kahler et al. 2000). BMPs, including the use of low-intensity lighting for artificial lighting in proximity to water bodies, will be implemented and incorporated into night lighting designs. The lights will be shielded and focused on the bridge away from water surfaces, which will minimize temporary and permanent impacts associated with night lighting to the river channel. Thus, impacts to critical habitat PBFs in the form of increased predation are expected to be minimal.

Mitigation and Onsite Riparian Habitat Restoration

The project proponent will implement onsite restoration and offsite compensation measures (i.e., purchase compensatory mitigation bank credits) to compensate for the permanent and temporary loss of SRA cover habitat (0.17 acres), riverine habitat (0.17 acres), and riparian tree habitat (six trees, ≥ 4-inches DBH). To compensate for the permanent impacts to SRA habitat, the project applicant proposes onsite, in-kind restoration at a 4:1 ratio with a 5-year monitoring and management period. The total onsite restoration acreage is 0.68 acres for SRA habitat. To compensate for the loss of riparian tree habitat, the project applicant proposes planting new, in-kind native trees around the project site at a 3:1 ratio with a 5-year monitoring and management period. A total of 18 trees will be planted. If temporal delays in restoration and planting will occur, an additional 1:1 ratio will be added (for each year that restoration and planting activities are delayed, post-construction). To compensate for the permanent and temporary impacts to riverine habitat, the proposed action includes the purchase of salmonid restoration mitigation credits at a 3:1 ratio. The applicant purchased 0.51 acres of riparian floodplain forest/salmonid restoration mitigation credits at Fremont Landing Conservation Bank on January 3, 2024.

The restoration site and disturbed areas around the project site will additionally be revegetated with fast-growing riparian species, such as willows, to minimize erosion, assist in bank stabilization, and assist in the recovery of the riparian area. Trees removed will also be placed in the streambed, as feasible, around the project site to provide LWM for juvenile rearing habitat. Native vegetation will be used in restoration and revegetation around the project site that will result in an additional increase in the quantity and quality of riparian habitats in the Little Chico Creek watershed. The Notre Dame Bridge Restoration Site is part of a larger restoration project (i.e., Little Chico Creek Restoration Project, 14.67 acres), adjacent to and upstream of the project site, which is intended to create an ecologically functional and enhanced riparian corridor within the Little Chico Creek watershed. These actions will improve the growth and survival of rearing CCV steelhead and migratory corridors by providing abundant food in the form of aquatic invertebrates, structural diversity, such as instream woody material and cooler stream temperatures. Restoration of these habitats may also benefit CV spring-run Chinook salmon that may rear and migrate through the Little Chico Creek watershed, by improving migratory corridors, improving rearing habitat, and creating additional riparian forest that will provide prey in the form of aquatic invertebrates.

The purchase of riparian floodplain forest/salmonid habitat restoration mitigation credits at Fremont Landing Conservation Bank will restore and create, in perpetuity, riparian floodplain

forest habitat that will be beneficial to CCV steelhead. Established in 2006, the Fremont Landing Conservation Bank is 100-acre floodplain site along the Sacramento River at the confluence of the Feather River (Sacramento River Mile 80) and is approved by NMFS to provide credits for impacts to CCV steelhead, Sacramento River winter-run Chinook salmon, and CV spring-run Chinook salmon. The primary goal of the Bank is to preserve, restore, and create riparian and floodplain wetland habitats which will improve special-status fisheries habitat for Central Valley Chinook salmon and steelhead and provide offsite mitigation for impacts to these species within the region.

The purchase of riparian floodplain forest/salmonid habitat restoration mitigation credits will address the loss of ecosystem functions due to the modification of riverine habitat as a result of the proposed project. These credit purchases are ecologically relevant to the PBFs of CCV steelhead critical habitat, as riparian floodplain forest credits will benefit CCV steelhead freshwater rearing habitat and migration corridors by providing suitable floodplain and riparian habitat. The riparian forest and floodplain habitats in the bank benefit the growth and survival of rearing salmonids by providing habitat with abundant food in the form of aquatic invertebrates, structural diversity, such as instream woody material (IWM) and cooler stream temperatures.

The purchase of mitigation credits provides a high level of certainty that the benefits of a credit purchase will be realized, as NMFS-approved banks, including Fremont Landing Conservation Bank, 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. In addition, each bank has a detailed credit schedule, and each tracks their credit transactions and availability on the Regulatory In-lieu fee and Bank Information Tracking System (RIBITS).

2.6. Cumulative Effects

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

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

2.6.1. Water Diversions

Water diversions for municipal and industrial use are found near the action area. Depending on the size, location, and season of operation, these unscreened diversions entrain and kill many life stages of aquatic species, including juvenile listed anadromous species.

2.6.2. Agricultural Practices

Non-Federal actions that may affect the action area include ongoing agricultural activities in the Little Chico Creek watershed. Farming and ranching activities within or adjacent to or upstream of the action area may have negative effects on water quality due to runoff laden with agricultural chemicals. Stormwater and irrigation discharges related to agricultural activities contain numerous pesticides and herbicides that may adversely affect salmonid reproductive success and survival rates (King et al. 2014). Grazing activities from cattle operations can degrade or reduce suitable critical habitat for listed salmonids by increasing erosion and sedimentation, as well as introducing nitrogen, ammonia, and other nutrients into the watershed, which then flow into the receiving waters of the associated watersheds. Agricultural practices in the Little Chico Creek watershed may adversely affect riparian and wetland habitats through upland modifications of the watershed that lead to increased siltation or reductions in water flow.

2.6.3. 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 which are 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.

2.6.4. Rock Revetment and Levee Repair Projects

Cumulative effects include non-Federal riprap 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 Little Chico Creek watershed. The effects of such actions result in continued degradation and fragmentation of riparian and freshwater habitat and the conversion of complex, dynamic nearshore aquatic habitats to simplified habitats with impaired ecosystem functioning.

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 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. Summary of the Status of the Species and Critical Habitat

CV spring-run Chinook salmon ESU and CCV steelhead DPS have experienced significant declines in abundance and available habitat in the California Central Valley over the last century relative to historical conditions. The status of the species (Section 2.2) details the current range-wide status of the ESU and DPS and critical habitat for CCV steelhead. Factors that led to the current listing of these listed fish species under the ESA include past and present human activities, drought, hatchery influence, dam construction, and habitat limitation and degradation 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 current status of listed anadromous fish species has not significantly improved since the species' previous status reviews (NMFS 2016a, 2016b, SWFSC 2022) and, in some cases, has declined further. The CV spring-run Chinook salmon ESU and CCV steelhead DPS are constrained by small population sizes and altered habitat that is susceptible to climate change. If measures are not taken to reverse these trends, the recovery and survival potential of CV spring-run Chinook salmon and CCV steelhead will continue to worsen. The critical habitat for CCV steelhead is degraded from historical conditions, but is still considered critically important to the recovery and conservation of the CCV steelhead DPS.

2.7.2. Summary of the Environmental Baseline and Cumulative Effects

The environmental baseline (Section 2.4) describes the current baseline conditions found in Little Chico Creek, where the proposed action is to occur. Factors affecting the listed species in the action area include passage barriers, habitat loss, predation, water quality and temperature management, urbanization, and agricultural development. Section 2.4.3 discusses the vulnerability of listed species and critical habitat to climate change projections in the California Central Valley, with reduced summer flows and increased water temperatures likely to occur within many if not most watersheds in the Central Valley. The cumulative effects from continuing activities described in Section 2.6 are expected to continually negatively affect federally listed anadromous fish species and further diminish the functional value of critical habitat for the conservation of the species within the action area through various pathways including, but not limited to, decreased water flow and quality, increases in water temperatures, levee construction and bank protection, increased stormwater and agricultural runoff, and riparian habitat degradation and fragmentation.

2.7.3. Summary of Effects of the Proposed Action to Listed Species

While Little Chico Creek is expected to be dry/low flowing/disconnected during the proposed in-water work window of June 1 to October 15, it is possible for water to be present in early summer months during a high flow year. For these reasons, effects of the proposed action have been analyzed in correspondence to the listed fish species and life stages that may be present in

the action area during the in-water work window in a high flow year, and throughout the entire project work window. Life stages of species that are expected to be present during the proposed in-water work window (June 1 to October 15) include juvenile CCV steelhead and adult CV spring-run Chinook salmon. Life stages of species that are expected to be present during the construction period (March to November) include juvenile and adult CCV steelhead and juvenile and adult CV spring-run Chinook salmon. The proposed action is expected to affect juvenile and adult CV spring-run Chinook salmon and CCV steelhead. The project is expected to result in the harassment, harm, injury or death and predation-related mortality of individuals from fish capture, handling, and relocation during dewatering. The project is also expected to result in minor effects as a result of increases in turbidity and sedimentation, hydroacoustic impacts, stormwater runoff, and construction-related impacts.

The implementation of a capture and relocation plan during dewatering activities is expected to increase overall survival of listed fish species; however, a small proportion of fish captured and relocated is likely to result in injuries and death. While adult CV spring-run Chinook salmon and juvenile CCV steelhead may occur in the action area during in-water work, we expect minimal occurrence of individuals in the system due to the timing of in-water work activities (i.e., work will not occur during peak migrations and when water conditions minimize fish presence). Thus, the potential capture and relocation of listed fish species associated with dewatering activities is expected to adversely affect a small number of individuals. Since fish relocation activities will be conducted by qualified fisheries biologist following NMFS guidelines, direct effects to and mortality of adult CV spring-run Chinook salmon and juvenile CCV steelhead during relocation activities is expected to be minimized. Thus, a low mortality/injury rate of individuals is expected to result from fish capture and relocation.

2.7.4. Summary of Effects of the Proposed Action to Critical Habitat

Critical habitat has been designated for CCV steelhead within the action area. Relevant PBFs of the designated critical habitats include juvenile and adult migratory corridors and juvenile rearing habitat. Based on the effects of the proposed project described previously in this opinion, the impacts are expected to permanently degrade a small portion of designated critical habitat with the loss of SRA, riparian, and riverine habitat, and the introduction of permanent overwater shading. Permanent impacts to CCV steelhead critical habitat are expected to be offset by the proposed onsite restoration and compensatory mitigation. The impacts of stormwater runoff, pollutants, increased sedimentation and turbidity, and lighting to critical habitat PBFs are expected to be minimal.

The quality of the current conditions of PBFs in the action area are poor compared to historical conditions. In particular, levees, riprapping, and removal of riparian vegetation have greatly diminished the value of the aquatic habitat in the action area by decreasing rearing area, food resources via food-web degradation, and complexity and diversity of habitat forms necessary for holding and rearing (channel diversity). Building and perpetuating the life of an overwater and in-water structure with the construction of the proposed new bridge would contribute to the degradation of designated critical habitat.

The project will result in the permanent loss of 0.17 acres of SRA habitat, six trees ($\geq$ 4-inches DBH) within riparian habitat, and the temporary and permanent loss of 0.17 acres of riverine

habitat, adversely affecting migration and rearing habitat PBFs of critical habitat through a reduction of near-shore cover, habitat quality, food production, and increased predation. As mitigation for impacts to SRA habitat, the applicant will implement onsite restoration at a 4:1 ratio (0.68 acres total) with a 5-year monitoring and management period. As mitigation for the loss of riparian tree habitat, the applicant will plant native trees around the project site at a 3:1 ratio (18 trees total) with a 5-year monitoring and management period. Removed trees will be placed in the streambed to augment rearing habitat. Restoration and tree planting are expected to begin prior to project implementation in Spring 2025 (or Spring 2026 if delays occur with the expected 2025 project timeline). If temporal delays in restoration and planting will occur, an additional 1:1 ratio will be added (for each year that restoration and planting activities are delayed, post-construction). As mitigation for the permanent and temporary impacts to riverine habitat, the applicant has purchased riparian floodplain forest/salmonid restoration mitigation credits at a 3:1 ratio (0.51 acres total) at Fremont Landing Conservation Bank.

Onsite riparian restoration is expected to benefit the PBFs of freshwater rearing habitat and migration corridors for CCV steelhead by providing suitable SRA and riparian habitat. The SRA and riparian forest habitat will benefit the growth and survival of rearing salmonids by providing habitat with abundant food in the form of aquatic invertebrates, cooler stream temperatures, and structural diversity, such as instream woody material.

2.7.5. Risk to Listed ESUs/DPSs and Critical Habitat at the Designation Level

Little Chico Creek contains juvenile and adult populations of CCV steelhead and CV spring-run Chinook salmon that use the creek primarily for rearing and migrating. CCV steelhead have also been known to spawn in the upper reaches of Little Chico Creek. According to the most recent status reviews, CCV steelhead and CV spring-run are at some level of threat or risk of extinction due to past and present activities within the greater Sacramento River watershed that have caused significant habitat loss, degradation, and fragmentation. Cumulative effects like water diversions, increased urbanization, ongoing agricultural practices, and continuing RSP (i.e., riprap) projects will all continue to happen in and adjacent to the action area without necessarily requiring Federal permitting.

During the proposed project, fish are expected to be harassed, injured, or killed through various pathways, including dewatering and fish capture and relocation, overwater shading resulting from the construction of a new bridge, and riparian and riverine habitat degradation and loss. Specific avoidance and minimization measures (e.g., conducting in-water work when the creek is expected to be dry/low flowing/disconnected or when creek conditions preclude fish presence) and BMPs are in place to ensure minimal presence of anadromous listed fish and to minimize impacts to listed species. Additionally, several effects identified are minimal or minor in nature (turbidity and sedimentation, hydroacoustic impacts, stormwater runoff, construction-related impacts, and lighting). Onsite restoration and offsite compensatory mitigation at Fremont Landing Conservation Bank will minimize the loss of riparian and riverine ecosystem function. Overall, the number of fish present in the action area is not expected to represent a substantial proportion of the population present in the system; thus, project impacts are not expected to affect the other populations of the ESUs or DPSs within Little Chico Creek of CV spring-run Chinook salmon ESU and CCV steelhead DPS and will not negatively affect their viability.

Combining the adverse and minor effects and effects from mitigation (onsite restoration and offsite compensatory mitigation) associated with the proposed action, including the environmental baseline, cumulative effects, status of the species, and critical habitat, the project is not expected to reduce appreciably the likelihood of both the survival and recovery of the listed species in the wild by reducing their numbers, reproduction, or distribution; or appreciably diminish the value of designated 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 the cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of CV spring-run Chinook salmon and CCV steelhead and or destroy or adversely modify the designated critical habitat of CCV steelhead.

2.9. Incidental Take Statement

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

2.9.1. Amount or Extent of Take

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

NMFS anticipates incidental take of adult and juvenile CV spring-run Chinook salmon and adult and juvenile CCV steelhead in the form of harassment, harm, injury or mortality as a result of project implementation. Adverse effects are expected due to dewatering and fish capture and relocation, overwater shading resulting from the construction of a new bridge, and riparian and riverine habitat degradation and loss.

NMFS cannot precisely quantify and track the amount or number of individuals per species that are expected to be taken incidentally as a result of the proposed project. This is due to the variability and uncertainty associated with the response of listed species to the effects of the proposed action, the varying population size of each species, annual variations in the timing of

migration, individual habitat use within the action area, and difficulty in observing injured or dead fishes. However, it is possible to estimate the extent of incidental take by designating, as ecological surrogates, those elements of the project that are expected to result in incidental take. Ecological surrogates are more predictable and/or measurable, and monitoring those surrogates will determine the extent to which incidental take is occurring. The most appropriate thresholds for incidental take are ecological surrogates of temporary habitat disturbance during dewatering activities and permanent habitat disturbance from riparian and riverine habitat removal and overwater shading from construction of the new bridge.

NMFS anticipates incidental take will be limited to the following forms:

1) Fish capture and relocation: Take in the form of harm, harassment, injury, and death to juvenile CCV steelhead and adult CV spring-run Chinook salmon due to fish capture, handling, and relocation during construction of a TWDS and dewatering of 0.18 acres of riverine habitat. In-water construction activities are expected to occur when the creek is dry/low flowing/disconnected (June 1 to October 15); however, any water present during this timeframe, will be dewatered before channel work is expected to occur. Dewatering activities and fish capture/handling/relocation are reasonably certain to result in harm, harassment, injury, and death to CCV steelhead and CV spring-run Chinook salmon through increased stress, injury, and predation (resulting in reduced growth and fitness and decreased survival), as well as an alteration in rearing, migrating, and sheltering behavior. The size of the dewatered section (0.18 acres) is the ecological surrogate for incidental take as fish capture/handling/relocation will occur in the dewatered area and directly impact juvenile CCV steelhead and adult CV spring-run Chinook salmon. Small numbers of each species are expected to be affected.

   If the total acreage of the dewatered area exceeds 0.18 acres by more than 10 percent (0.018 ac), then anticipated take levels described are also exceeded, triggering the need to reinitiate consultation.

2) Riparian and SRA habitat permanent impacts: Take in the form of harm and injury to adult and juvenile CCV steelhead from the loss and degradation of riparian and SRA habitat. These permanent impacts on CCV steelhead critical habitat total 0.17 acres from SRA habitat removal; and removal of six trees (≥ 4-inches DBH) within riparian habitat. Degradation and removal of riparian and SRA habitat is reasonably certain to result in harm and injury to the species through modification or degradation of the PBFs for rearing and migration that will result in temporary displacement of individuals, loss of cover, increased predation, and reduced growth and fitness due to decreased food inputs. The ecological surrogate for incidental take associated with these permanent impacts to critical habitat is 0.17 acres of SRA habitat removal and six trees (≥ 4-inches DBH) of riparian tree habitat.

   If the above parameters of these ecological surrogates are exceeded, the anticipated incidental take levels described are also exceeded, triggering the need to reinitiate consultation.

3) Riverine habitat permanent impacts: Take in the form of harm and injury to adult and juvenile CCV steelhead from the loss and degradation of riverine habitat. These permanent impacts on CCV steelhead critical habitat total 0.07 acres for new bridge piers constructed and RSP placement in the channel; and 0.072 acres for bridge shading. Temporary impacts on CCV steelhead critical habitat total 0.03 acres for temporary construction-related activities (i.e., access routes and work area). Degradation and removal of riverine habitat is reasonably certain to result in harm to the species through modification or degradation of the PBFs for rearing and migration that will result in temporary displacement of individuals, loss of cover, increased predation, and reduced growth and fitness due to decreased food inputs. Permanent shading from the bridge deck is expected to reduce primary productivity and increase risk of predation. The ecological surrogate for incidental take associated with these permanent and temporary impacts to critical habitat is 0.07 acres for constructed piers and RSP; 0.072 acres for bridge shading; and 0.03 acres for temporary construction-related activities.

   If the above parameters of these ecological surrogates are exceeded, the anticipated incidental take levels described are also exceeded, triggering the need to reinitiate consultation.

2.9.2. Effect of the Take

In the 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 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, including any and all individuals and/or employees contracted to carry out the work, to ensure the implementation of the project as proposed in this opinion, as well as implementation and adherence to best management practices and conservation measures. Deviations from the proposed project will require review and approval by NMFS.

2. Measures shall be taken by USACE, including any and all individuals and/or employees contracted to carry out the work, to ensure that dewatering and fish capture, handling, and relocation will be conducted according to the specifications provided to NMFS and the NMFS-approved supervising biologist(s) will oversee all aspects of dewatering, implementation of the TWDS, and fish capture, handling, and relocation operations.

3. Measures shall be taken by USACE, including any and all individuals and/or employees contracted to carry out the work, to minimize impacts to listed species and their critical habitat from project specific activities.

4. Measures shall be taken by USACE, including any and all individuals and/or employees contracted to carry out the work, to minimize the effect of temporary and permanent habitat loss of riverine and riparian habitat.

5. Measures shall be taken by USACE, including any and all individuals and/or employees contracted to carry out the work, to monitor and report on the amount and extent of incidental take of listed species during project activities and monitor and report on onsite restoration implementation, progress, and completion.

2.9.4. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Federal action agency must comply (or must ensure that any applicant complies) with the following terms and conditions. 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. Proposed pile-driving activities will occur between July 1 and October 15 when Little Chico Creek is expected to be dry/low flowing/disconnected. If flowing water is present at the beginning of this timeframe, pile driving will be delayed until the creek is dry (i.e. dry from dewatering activities or naturally occurring) or when flows (i.e. low flowing or pooled, disconnected water) and creek conditions are unlikely suitable for any life stage of salmonid. A qualified fisheries biologist with work-stop authority shall evaluate creek conditions to determine if creek conditions preclude CCV steelhead and CV spring-run Chinook salmon presence. Pile-driving activities shall not commence until approval by the qualified fisheries biologist.

    b. USACE and the applicant shall provide a copy of this opinion to the primary contractor, making the primary contractor responsible for implementing all requirements and obligations included in this document and for educating and informing all other individuals and contractors involved in the project as to the requirements of this opinion. A notification that the contractor has been supplied with this information shall be provided to NMFS via email (see email address below in 5(d)) prior to project implementation. A copy of this opinion shall be available on-site at all times during project activities.

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

    a. A written plan for a fish capture, handling, and relocation operation specific to this project shall be provided to NMFS for review and approval 45 days prior to implementation of in-water activities. The fish relocation plan shall include information on credentials of the biologist(s) that will capture and relocate fish, specific gear and techniques to be used to capture fish, information on equipment proposed to keep fish

cool and aerated after collection and before release, criteria used to identify release sites, and alternative release sites. The plan shall be thoroughly understood by all individuals that are to be involved and operations shall be conducted in strict accordance with the written plan.

b. The contractor shall retain qualified biologists with expertise in the area of anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. The contractor shall ensure that all fisheries biologists working on this project be qualified to conduct fish collections in a manner that minimizes all potential risks to ESA-listed salmonids.

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

d. A written plan for dewatering operations and a TWDS specific to this project shall be provided to NMFS for review and approval 45 days prior to implementation of in-water activities. These plans shall include BMPs and avoidance and minimization measures to minimize impacts to listed species, such as measures to prevent/minimize turbidity and sedimentation. Fish passage in the main channel shall be maintained at all times during dewatering activities. All pumps, pipes and other diversion materials, and any construction debris and materials shall be removed from the stream channel upon in-water work completion and no later than October 15. These plans shall be thoroughly understood by all individuals that are to be involved and operations shall be conducted in strict accordance with the written plan.

e. All aspects of dewatering, implementation of a TWDS, and fish capture, handling, and relocation operations shall be supervised by at least one NMFS-approved biologist who shall be on site throughout each phase of the capture, handling, and relocation operation.

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

a. If a TWDS is implemented, all pumps used to divert live streamflow shall be screened and maintained throughout the construction period to comply with NMFS' Fish Screening Criteria for Anadromous Salmonids (NMFS 2022).

b. If pumping is necessary to dewater the construction site, the water shall be discharged to an upland location in a manner that the water does not drain overland back to the stream channel. Pump intakes shall be covered with appropriately sized screening material, complying with currently approved NMFS Fish Screening Criteria (NMFS 2022), to

prevent potential entrainment of fish that failed to be removed. The sump and intake shall be checked periodically for fish and other aquatic wildlife.

c. Routine maintenance of structures constructed to treat stormwater runoff shall receive regular long-term maintenance, with a focus on maintenance of the site in the early fall prior to the first rains of the winter season.

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

   a. The applicant shall submit a comprehensive Restoration and Mitigation Plan to NMFS for review and approval 60 days prior to implementation of restoration. The plan shall outline the implementation and maintenance of all onsite restoration including, but not limited to, performance goals, monitoring plans, replanting plans, and an adaptive management plan for how mitigation will be addressed if the restoration site fails. Restoration and planting implementation is expected to begin prior to project implementation in Spring 2025; however, may be delayed to Spring 2026 if delays occur with the expected 2025 project timeline. If project and restoration/planting implementation is delayed, the applicant will notify NMFS of the updated project and restoration timeline status. For each year that restoration and planting activities are delayed post-construction, an additional 1:1 ratio will be added to account for temporal delays.

   b. The contractor shall monitor and maintain all riparian plantings for five years, and provide irrigation, fertilization and replacement plantings as necessary to ensure full and rapid recovery of disturbed riparian habitat features. Appropriate interpretative signage shall be placed at the restoration site and additional revegetated areas to inform the public of riparian habitat restoration efforts and goals and the threatened steelhead, Chinook salmon and critical habitat that occur within the Little Chico Creek watershed and actions that the public can take to help and/or prevent further harm to those species.

   c. The applicant or contractor shall provide NMFS a post-construction field review of both the project and restoration site, as well as yearly field reviews for five years, to assure conservation measures were adequately implemented and whether additional plantings are needed to establish adequate riparian vegetation. The applicant or contractor should successfully re-vegetate at least 80 % at the project site and 80% at the restoration site. The first review should occur the year following construction completion (by March 1). The field review shall include the following elements:

      i. Seasonal surveys to determine adequate cover and plant survival throughout the year is being met.

      ii. A survival ratio to ensure planting of new vegetation is implemented during the first five years when necessary.

iii. Photo point monitoring shots at the established restoration and revegetated sites to be used as a tool to determine success and survival rates. The photos shall be taken annually on the same date, as much as practicable.

d. The applicant shall limit the amount of RSP used for instream protection to the minimum amount needed for erosion and scour protection. Engineering plans shall be provided to the contractors that clearly show the amount of RSP to be placed.

5. The following terms and conditions implement reasonable and prudent measure 5:

a. If a listed species is observed, injured, or killed by project activities, the applicant or contractor shall contact NMFS within 24 hours via email (see email address below in 5(d)). Notification shall include project name and relevant reference number, species identification, the number of fish, and a description of the action that resulted in take.

b. The applicant shall provide a written report to NMFS by March 1 of the year following construction of the proposed action. The report will be provided to NMFS via email (see email address below in 5(d)). The report must contain, at a minimum, the following information:

i. Construction Related Activities – The report must include the dates construction began and was completed, in-water construction dates and if water was present in the creek (including dates and water conditions such as flow and temperature), in-water work activities conducted and activity details (if water was present), in-channel work activities conducted and activity details (when creek was dry), avoidance and minimization measures taken, a discussion of any observed adverse effects on listed fish species and critical habitat, and a description of any and all measures taken to minimize those adverse effects. The report must also include a description of any observations or incidental take of species that occurs as part of project activities including fish known to have been killed or injured during project activities, fish species and life stages affected, amount, and area found.

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

c. The applicant shall provide annual written reports to NMFS by March 1 for five (5) years post-construction with the results of riparian vegetation restoration at the restoration site and around the project site. The report will be provided to NMFS via email (see email

address below in 5(d)). The report must contain, at a minimum, the following information:

i. The report shall include a summary of the post-construction field review and annual monitoring, maintenance, and performance activities, including success measures, conducted for Term and Condition 4(a,b,c) above for both the restoration site and for vegetation restoration around the project site. The report shall also include monitoring and site photographs, a description of any supplemental riparian replanting to meet success criteria for vegetation restoration, and the number and locations of removed trees placed within the streambed for LWM.

d. All reports for NMFS shall be sent by email to:

Assistant Regional Administrator
National Marine Fisheries Service
California Central Valley Office
Email: ccvo.consultationrequests@noaa.gov

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 should continue to 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 and other watersheds and support recovery actions in the NMFS Salmonid Recovery Plan (NMFS 2014). Implementation of future restoration projects and supporting recovery actions is consistent with agency requirements set forth in section 7(a)(1).

2) USACE should encourage applicants to limit the amount of RSP used for bank and in-stream protection in the Central Valley to the minimum amount needed for erosion and scour. Limitation of RSP in design considerations is consistent with agency requirements set forth in section 7(a)(1).

3) USACE should encourage applicants to consider using alternative methods to traditional RSP for bridge projects and incorporating geotextiles for bank erosion control and prevention. Bioengineered products are available on the market and can be used to protect areas against erosive forces along shorelines and is an alternative to using riprap. Implementation of RSP alternatives in design considerations is consistent with agency requirements set forth in section 7(a)(1).

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

2.11. Reinitiation of Consultation

This concludes formal consultation for Notre Dame Blvd Over Little Chico Creek Bridge 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 opinion or written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified 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 is designated under the Pacific Coast Salmon FMP, which includes the action area of the proposed action. EFH in the action area consists of adult migration habitat and juvenile rearing

and migration habitat for the four Chinook salmon runs (winter-, spring-, fall-, and late fall-run Chinook salmon). 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 Essential Fish Habitat

The potential effects of the proposed action on EFH for Pacific Coast salmon include permanent effects to riparian and riverine habitat. Effects to EFH for Pacific Coast salmon are discussed in the context of effects to critical habitat PBFs as designated under the ESA and described in section 2.5.2. The effects are expected to be similar to the impacts affecting critical habitat and include the following:

Permanent habitat loss/modification

- Reduced shelter from predators
- Reduction/change in aquatic macroinvertebrate production
- Reduced habitat complexity
- Reduced shade
- Reduced supply of terrestrial food resources
- Reduced supply of LWM

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.

1) To address the adverse effects of permanent habitat loss/modification, NMFS recommends implementation of Section 2.9.4, Terms and Conditions 4(a),(b), and (c).

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 USACE and the City of Chico. Other interested users could include U.S. Fish and Wildlife Service or California Department of Fish and Wildlife. Individual copies of this opinion were provided to the USACE. 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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