



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

Refer to NMFS No: WCRO-2021-01158

September 28, 2021

Mr. Ramon Aberasturi  
Regulatory Project Manager  
California Delta Section  
U.S. Army Corps of Engineers, Sacramento District  
1325 J Street  
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 Brannan-Andrus Levee Maintenance District Sacramento River Erosion Repair and Habitat Enhancement Project (SPK-2017-00424)

Dear Mr. Aberasturi:

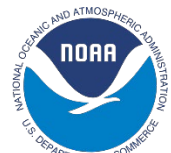
This letter responds to your April 27, 2021, request for initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) for the subject action. Your request qualified for our expedited review and analysis because it met our screening criteria and contained all required information on, and analysis of, your proposed action and its potential effects to listed species and designated critical habitat.

We reviewed the U.S. Army Corps of Engineers' (USACE) consultation request and related initiation package. Where relevant, we have adopted the information and analyses you have provided and/or referenced but only after our independent, science-based evaluation confirmed they meet our regulatory and scientific standards. We adopt by reference here the following:

- The Brannan-Andrus Levee Maintenance District Sacramento River Erosion Repair and Habitat Enhancement Project biological assessment (BA) submitted with the USACE permit application (Robertson-Bryan Inc. 2020).
- USACE consultation request letter for this project dated April 27, 2021, and received by NMFS on April 29, 2021.

April 27, 2021 - USACE requested formal consultation. We adopt by reference section 2 of the BA, which describes the consultation history in more detail. More information on irrigation/pumping for riparian plantings was requested on May 13, 2021. Consultation was initiated on May 13, 2021.

We adopt by reference Section 3 of the BA, which describes the proposed action, including project components, construction phasing, and conservation measures. NMFS also hereby adopts the Aquatic Resources Delineation dated November 23, 2020 from Rincon Consultants, which



amends the impact acreage of the project as previously described in the BA. USACE proposes to issue a Standard Permit to Brannan-Andrus Levee Maintenance District to repair areas of levee erosion on the left bank of the Sacramento River between the City of Isleton and the confluence of the Sacramento River and the Deep Water Ship Channel. In summary, the construction comprises of site preparation, levee slope and bench construction, Gripper/Terrabag system placement (an alternative bank stabilization method to riprap), removal and relocation of encroachments, and then revegetation and demobilization. In general, the construction activities would include excavation, vibratory pile driving, and vegetation trimming, grubbing, barging of materials, and pumping to irrigate replanted vegetation. The project would increase levee stability and improve the level of flood protection for Brannan and Andrus Islands by repairing areas of levee erosion. The project will use methods of erosion control that will also provide enhanced riparian and wetland habitat (*i.e.*, habitat benches). The applicant proposes to create approximately 2.59 acres of out-of-kind wetland and riparian habitat benches, create an additional 0.7 acres of mixed riparian habitat just above the onsite wetland benches, and purchase 3.04 acres of out-of-kind Riverbank Shaded Riverine Aquatic Habitat credits at Fremont Landing Conservation Bank as mitigation for the permanent loss of benthic soft bottom habitat.

We adopt here by reference section 4 of the BA, which describes the status of the federally listed species and designated critical habitats occurring within the action area, including the most recent 5-year status reviews for each species. We examined the status of each species that would be adversely affected by the proposed action to inform the description of the species’ “reproduction, numbers, or distribution” as described in 50 CFR 402.02. We also examined the condition of critical habitat throughout the designated area and discuss the function of the physical or biological features essential to the conservation of the species that create the value of that habitat.

“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). We adopt by reference section 3.3 of the BA for a full description of the action area, as depicted in Figure 1 below. In summary, the action area includes erosion control and habitat enhancement sites that extend from Sacramento River mile 14.60 to 17.34, beginning downstream near the confluence of Steamboat Slough, Cache Slough, and the Sacramento River and extending upstream to the City of Isleton. The action area includes the approximately 1.2 NM portion of the Sacramento River, including the bed and bank, where active levee construction will occur. The action area also includes the Sacramento River in between the three sites and upstream and downstream of the active construction areas due to possible effects of construction on the water quality of the river (*e.g.*, increased turbidity).

As the proposed action includes the purchase of credits at the Fremont Landing Conservation Bank, the bank is also part of the action area. This bank is located north of Interstate 5 and immediately west of the Sacramento River, and falls within the service area of the project and all 4 of the species critical habitats being affected: Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*) evolutionarily significant unit (ESU), Central Valley spring-run Chinook salmon ESU (*O. tshawytscha*), the southern distinct population segment (DPS) of the North American green sturgeon (*Acipenser medirostris*), and California Central Valley steelhead (*O. mykiss*) DPS.



Figure 1. Action area as depicted in section 3.3 of the BA (Robertson-Bryan, Inc. 2020)

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). We adopt by reference here section 5.3 of the BA, which describes the environmental baseline for the action area. In summary, many of the physical and biological features identified in the respective critical habitat designations are degraded and provide limited high-quality habitat. Factors that lessen the quality of migratory corridors in the region include unscreened or inadequately screened diversions, altered flows and corresponding water temperatures, the scarcity of complex in-river cover, and a lack of seasonally inundated floodplain habitat. The action area provides migratory and rearing habitat for winter-run, spring-run, steelhead, and green sturgeon.

As the proposed action includes purchase of credits at an approved mitigation bank, the environmental baseline includes the ecological value of credits that have already been sold for the Fremont Landing Conservation Bank as described below. Mitigation/Conservation banks present a unique factual situation, which warrant a particular approach to how they are addressed. Specifically, when NMFS is consulting on a proposed action that includes mitigation bank credit purchases, it is likely that physical restoration work at the bank site has already occurred and/or that a section 7 consultation occurred at the time of bank establishment. A traditional reading of “environmental baseline” might suggest that the overall ecological benefits

of the mitigation bank actions therefore belong in the environmental baseline. However, under this reading, all proposed actions, whether or not they included proposed credit purchases, would benefit from the environmental “lift” of the entire mitigation bank, because it would be factored into the environmental baseline. In addition, where proposed actions did include credit purchases, it would not be possible to attribute their benefits to the proposed action without double counting. These consequences undermine the purposes of mitigation banks and do not reflect their unique circumstances. Specifically, mitigation banks are established based on the expectation of future credit purchases. In addition, credit purchases as part of a proposed action will also be the subject of a future section 7 consultation.

It is therefore appropriate to treat the beneficial effects of the bank as accruing incrementally at the time of specific credit purchases, not at the time of bank establishment or at the time of bank restoration work. Thus, for all projects within the service area of a bank, only the benefits attributable to credits sold are relevant to the environmental baseline. Where a proposed action includes credit purchases, the benefits attributable to those credit purchases are considered effects of the action. That approach is taken in this opinion.

Fremont Landing Conservation Bank is a 100-acre site that was approved in 2006 by NMFS to provide compensatory credits for project impacts through the preservation and restoration/creation of riparian forest and shaded riverine aquatic habitats, and provides riparian, wetland, and open-water habitat along the Sacramento River near the mouth of the Feather River. The ecological value (increased rearing habitat for juvenile salmonids) of sold credits are part of the environmental baseline. Of the types of credits available, the salmonid riparian restoration credits are most applicable to this project. All features of this bank are designated critical habitat for the Sacramento River winter-run Chinook salmon ESU (winter-run or Sacramento River winter-run Chinook salmon), Central Valley spring-run Chinook salmon ESU (spring-run or CV spring-run Chinook salmon), southern DPS of the North American green sturgeon (green sturgeon or sDPS green sturgeon), and California Central Valley steelhead DPS (steelhead or CCV steelhead).

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

The BA provides a detailed discussion and comprehensive assessment of the effects of the proposed action in Section 6.2 of the initiation package, and is adopted here (50 CFR 402.14(h)(3)). NMFS has evaluated this section and after our independent, science-based evaluation determined it meets our regulatory and scientific standards. In summary, the potential effects include:

- Temporary effects to water quality, including increased turbidity and suspended solids as a result of construction activities that include; site preparation, levee slope and bench construction, Terrabag/Gripper system (a type of soil filled bag used instead of riprap)

placement, removal/replacement of encroachments, removal of concrete rubble, and plant installation.

- Temporary effects to water quality from contaminants that may wash off construction equipment working in or near the river;
- Temporary effects from underwater noise as a result of operating tugboats and barges in the Sacramento River, and from operating construction equipment adjacent to and in the river channel;
- Direct effects, including disturbance, injury or mortality, as a result of in-river work activities listed above;
- Direct effects from tugboat propeller strikes or entrainment fishes and their food resources (*i.e.*, invertebrates, phytoplankton, and zooplankton) from barge trips; and
- Temporary effects to predator prey dynamics and increased predation of ESA-listed fish due to shading caused by temporary docking of one rock barge and one derrick barge.
- Long-term benefits to habitat from creation of riparian and wetland benches in the lower Sacramento River.
- Minor impacts from underwater sound, including behavioral changes, caused by vibratory pile driving.
- Creation of permanent shade from relocating a dock, which will increase predation and potentially delay salmonid migration.
- Suppression of submerged aquatic vegetation near the dock structure.
- Temporary reduction in riparian habitat quality. This habitat will fully recover within one to two years after construction is complete.
- Impacts and disturbance associated with in-water structure such as: damage to submerged aquatic vegetation caused by vessels, and increased noise from vessel engines
- Extending the useful life of levees, which continues to halt the meander and migration/reworking of natural floodplains, degrading rearing and migratory habitat.

Winter-run, spring-run, steelhead, and green sturgeon will be affected by the proposed action as described above. The effects of construction will be temporary and will not affect more than two cohorts of the affected populations.

The permanent loss of habitat on-site resulting from the proposed action is 3.04 acres. Loss of floodplain habitat and loss of wetland function have been identified as primary stressors affecting the recovery of Central Valley salmonid species (NMFS 2014), and green sturgeon (NMFS 2018). This threat primarily affects the physical or biological features essential to the conservation of the species (PBFs) of juvenile rearing and outmigration life stage of these

species, from the upper reaches of their watershed of origin through the Delta. Effects of the action that contribute to the loss of floodplain habitat are likely to result in a probable reduction in fitness of reduced growth and/or reduced survival probability. We expect a few individual fish within one population of each species will die each year as a result of the reduction of fitness caused by the proposed action.

“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. We adopt by reference section 6.4 of the BA, which describes the cumulative effects that are reasonably certain to occur within the action area.

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action to the environmental baseline and the cumulative effects, taking into account the status of the species and critical habitat, to formulate the agency’s biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

The perpetuation of the current levee system will result in the continued diminished functioning of the aquatic and riparian ecosystems, which reduces the contributions of these habitats to the survival of rearing and migrating listed species, particularly salmonids. Given the extensive loss of upstream spawning grounds and the extreme modification of habitat in the Sacramento River and its tributaries, careful consideration of the impacts of future levee projects is needed.

Considering that the proposed action will occur along the primary migratory corridor of the Sacramento River, we expect that all Sacramento River Basin populations of these species to be exposed and adversely affected by the action. With the nature and duration of the effects, we expect the proposed action to temporarily reduce the fitness and productivity of a portion of each species exposed to a project site during construction and for the first 5 years as re-vegetation occurs. The proposed action includes the creation of 3.29 acres of wetland and riparian habitat onsite for partial mitigation of effects of the action, which will result in temporary loss of wetland and riparian habitat until that habitat is created. In addition, the proposed action includes the purchase of 3.04 acres of mitigation bank credit for habitat that is permanently impacted due to the proposed action, either due to inability to be revegetated, rock placement, or relocation of encroachments.

The purchase of mitigation bank credits will address the loss of ecosystem functions due to the modification of the channel and riverbank. These credit purchases are ecologically relevant to the PBFs of critical habitat adversely affected by the proposed action, because the bank includes credits with habitat values that are already established and meeting performance standards. Also, the bank is located in an area that will benefit the species and designated critical habitat for those species that will be adversely affected by the proposed action.

The purchase of credits provides a high level of certainty that the benefits of a credit purchase will be realized, because the NMFS-approved bank considered in this opinion has 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.

At the ESU/DPS level, NMFS expects that the bank repair described in the proposed action will result in short term diminished function of PBFs related to rearing and migration within designated critical habitat in the action area. The proposed conservation measures and compensatory mitigation actions (both on-site and through credit purchases) are expected to offset loss of habitat function within the action area such that, on the whole, the loss of function of PBFs of critical habitat will be mitigated. Therefore, the program is not expected to reduce appreciably the likelihood of both the survival and recovery of the species.

The USACE implementation will include replanting of vegetative features to provide habitat value for fish species. Some of this will be replaced as part of the site design and construction, but there will be temporal gaps in function while the site plantings establish and grow. Based on the proposed action, unavoidable impacts will be mitigated, such that the program is not expected to appreciably diminish the value of designated critical habitat at the DPS level.

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of Sacramento River winter-run Chinook salmon, CV spring-run Chinook salmon, CCV steelhead, or sDPS green sturgeon or destroy or adversely modify any of their respective designated critical habitats.

## **1. INCIDENTAL TAKE STATEMENT**

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

## 1.1. Amount or Extent of Take

In the biological opinion, NMFS determined that implementation of the proposed action is reasonably certain to result in the incidental take of individual adult and juvenile Sacramento River winter-run Chinook salmon, CV spring-run Chinook salmon, CCV steelhead, and sDPS green sturgeon. Incidental take associated with the proposed action is expected to be in the form of mortality, harm, or harassment of a small number of individuals of the identified life stages of these species as they migrate through the action area. NMFS does not anticipate the incidental take of any spawning fish, or the eggs, fry, or larval life stages of any of the listed species considered in this opinion.

It is not possible to quantify or track the amount or number of individual listed fish that are expected to be incidentally taken per species as a result of the proposed action, due to the variability associated with the response of listed species to the effects of the action, the varying population size of each species, annual variations in the timing of migration, uncertainties regarding individual habitat use within the action area, and difficulty in observing injured or dead fish. However, it is possible to estimate the extent of incidental take by designating the following ecological surrogates, that are practical to quantify and monitor to determine the extent of incidental take that is occurring.

1. Take in the form of harm to rearing and migrating juveniles is expected within the project 3.04 acres footprint for areas being permanently impacted by rock placement or Terrabag installment within the channel. The ecological surrogate is based on the amount of rock placement or Terrabag placement, whatever new substrate is being used to cover the original substrate that was there prior to the Proposed Action. This is expected to result in injury or death to a small number of juvenile fish in the action area where placement is occurring below the waterline. Incidental take to rearing juvenile Sacramento River winter-run Chinook salmon, CV spring-run Chinook salmon, and CCV steelhead, and adult and juvenile green sturgeon from the repair will be limited to a total habitat impact of 3.04 acres. Therefore, incidental take will be exceeded if total permanent impacts to critical habitat exceeds 3.04 acres.
2. Take in the form of harm to rearing juvenile spring-run Chinook salmon, winter-run Chinook salmon, steelhead, and green sturgeon from increased turbidity in the footprint of the proposed project from construction activities, extending upstream and downstream 1,000 feet from the footprint of the site and 100 feet from the extent of the repair into the river channel. The ecological surrogate is the distance the turbidity plume travels away from the construction site. This disturbed habitat will affect the behavior of fish, including displacement, which is reasonably certain to result in increased predation, decreased feeding, and increased competition. Quantification of the number of fish exposed to turbidity is not currently possible with available monitoring data. Observations of individual fish within the river channel are not possible due to water clarity and depth. However, all fish passing through or otherwise present during construction activities at the rehabilitation sites will be exposed to construction-related turbidity events. Thus, the waterside footprint of each rehabilitation site plus the additional area of river channel where turbidity effects are expected to be observed defines the ecological surrogate for this project due to the effects of construction-related



turbidity. Incidental take will be exceeded if turbidity measured 1,000 feet downstream of the site exceeds double the upstream of the site turbidity measurement.

3. Take in the form of harm, injury and death to listed fish, is expected due to pile driving. The ecological surrogate for pile-driving activities is the single strike sound criteria for impact pile driving. Activities will affect adults and juveniles through direct stress, injury, or death. Activities may also cause harm through displacement, increased predation, and loss of food, resulting in decreased fitness, growth, and survival. Incidental take will be exceeded if the single strike criteria exposure; a SEL of 187 dB re: 1  $\mu\text{Pa}^2 \cdot \text{sec}$  and a peak sound pressure of 208 dB re: 1  $\mu\text{Pa}_{\text{peak}}$  as measured 10 m from the source is exceeded.
4. Take in the form of harm, injury, and death to listed fish is expected due to fish impingement during pumping activities for riparian irrigation. The ecological surrogate is based on the amount of water needed for planned pumping activities. Harm from stress or injury is also expected to cause displacement, increased predation, and loss of food, resulting in decreased fitness, growth, and survival. Incidental take will be exceeded if pumping activities occur outside the timeframes, or above the amounts of water indicated in Table 1.

Table 1. Estimated 3-5 year watering maintenance schedule for riparian habitat.

Monitoring Year	Watering
	(Years 1 & 2: March 15-November 15) (Year 3-5: April 1-October 31)
Year 1 (March 15-November 15)	50 gallons per plant or 3 inches of spray applied precipitation every 10 to 14 days
Year 2 (March 15-November 15)	30 gallons per plant or two inches of spray applied precipitation every week to 10 days
Year 3-5	10 gallons per plant or one inch of spray applied precipitation twice a week

5. Take in the form of harm, injury, and death to listed juvenile and adult fish is expected due to increased barge traffic in the Sacramento River during the proposed work window. Harm is also expected through displacement, increased predation, and loss of food, resulting in decreased fitness, growth, and survival. Incidental take will be exceeded, if barge trips for the proposed action occur outside the proposed work window of August 1 to October 31.

6. Take in the form of harm to rearing juvenile spring-run Chinook salmon, winter-run Chinook salmon, steelhead, and adult and juvenile green sturgeon from the temporary loss of 3.29 acres of wetland and riparian habitat. This loss will affect juveniles through displacement, increased predation, and loss of food, resulting in decreased fitness, growth, and survival. Incidental take will be exceeded if such temporary impacts to habitat exceed 3.29 acres within the project area.

## **1.2. Effect of the Take**

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species, or destruction or adverse modification of critical habitat.

## **1.3. 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).

The following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the impacts to Sacramento River winter-run Chinook salmon, CV spring-run Chinook salmon, CVC steelhead, and sDPS green sturgeon:

1. Measures shall be taken to minimize the impacts of the proposed bank protection construction.
2. Measures shall be taken to ensure necessary monitoring and Management Plans are developed.
3. Measures shall be taken to ensure that contractors, construction workers, and all other parties involved with these projects implement the projects as proposed in the biological assessment (BA) and this biological opinion (BO).
4. Measures shall be taken to monitor incidental take of listed fish and the survival of on-site plantings, reporting of annual repair status, and purchase of mitigation credits.

## **1.4. 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  
*“Measures shall be taken to minimize the impacts of the proposed bank protection construction”*:
  - a) The USACE shall minimize the removal of existing riparian vegetation and instream woody material (IWM), and removed IWM shall be anchored back into place or, if not feasible, new IWM shall be anchored in place.
  - b) The USACE shall use NMFS-approved aquatic sound attenuation devices for pile driving to reduce the transmission of sound through water. Attenuation devices can include bubble curtains, or others devices as approved by NMFS.
  - c) The USACE shall monitor turbidity during in-water work activities to ensure levels stay below the allowable thresholds (turbidity measured 1,000 feet downstream of the construction extent of the site is not to exceed double the upstream of site turbidity measurement).
  - d) The USACE shall ensure all pumping activities used for irrigation of riparian plantings, or other purposes, use NMFS-approved screens that meet all criteria for juvenile salmonids.
2. The following terms and conditions implement reasonable and prudent measure 2  
*“Measures shall be taken to ensure necessary monitoring and Management Plans are developed”*:
  - a) USACE shall provide NMFS with a Long Term Management Plan outlining the maintenance of all on-site mitigation and replanting. The plan shall include performance goals, monitoring plans, and replanting plans prior to construction beginning.
3. The following terms and conditions implement reasonable and prudent measure 3  
*“Measures shall be taken to ensure that contractors, construction workers, and all other parties involved with these projects implement the projects as proposed in the BA and this BO”*:
  - a) The USACE shall provide a copy of this BO and the BA, or similar documentation, but specifically emphasizing the proposed avoidance and minimization measures and Terms and Conditions, to the prime contractor, making the prime contractor responsible for implementing all applicable requirements and obligations included in these documents and to educate and inform all other contractors involved in the project as to the requirements of the BA and this BO. A notification that contractors have been supplied with this information shall be provided to the reporting address below.

- b) A NMFS-approved Worker Environmental Awareness Training Program for construction personnel shall be conducted by the NMFS-approved biologist for all construction workers prior to the commencement of construction activities. The program shall provide workers with information on their responsibilities with regard to federally listed fish, their critical habitat, an overview of the life history of all the species, information on take prohibitions, protections afforded these animals under the ESA, and an explanation of the conservations measures in the BA, and relevant terms and conditions of this BO. Written documentation of the training shall be submitted to NMFS within 30 days of the completion of training.
- 4. The following terms and conditions implement reasonable and prudent measure 3  
*“Measures shall be taken to monitor incidental take of listed fish and the survival of on-site plantings, reporting of annual repair status, and purchase of mitigation credits”:*
  - a) USACE shall provide to NMFS (at the address below) a vegetation monitoring report at years 1, 2, and 3 post-construction no later than December 31st of each reporting cycle. This report shall provide information as to the success of the revegetation program and whether the conservation goals are being met at each site. If goals are not being met, then the report shall indicate what actions are being implemented to meet those goals.
  - b) USACE shall provide to NMFS a report on the incorporation of the proposed avoidance and minimization measures and Terms and Conditions no later than December 31<sup>st</sup> of that year the measures were used.
  - c) USACE shall submit a report to NMFS of any incidental take that occurs as part of the project. This report shall be submitted within 48 hours of take occurring.
  - d) All reports for NMFS shall be sent to:

Cathy Marcinkevage  
California Central Valley Office  
National Marine Fisheries Service  
ccvo.consultationrequests@noaa.gov (email is 1<sup>st</sup> preference)  
650 Capitol Mall, Suite 5-100  
Sacramento California 95814  
FAX: (916) 930-3629  
Phone: (916) 930-3600

### **1.5. Conservation Recommendations**

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

1. The USACE should integrate the 2017 California Central Valley Flood Protection Plan's Conservation Strategy into all flood risk reduction projects they authorize, fund, or carry out.
2. The USACE should prioritize and continue to support flood management actions that set levees back from rivers and in places where this is not technically feasible, repair-in-place actions should pursue landside levee repairs instead of waterside repairs.
3. The USACE should consult with NMFS in the review of Engineering Technical Letter (ETL) variances for future projects that require ETL compliance.
4. The USACE should develop ETL vegetation variances for all flood management actions that are adjacent to any Central Valley anadromous fish habitat.
5. The USACE should use all of their authorities, to the maximum extent feasible to implement high-priority actions in the NMFS Central Valley Salmon and Steelhead Recovery Plan. High-priority actions related to flood management include setting levees back from riverbanks, increasing the amount and extent of riparian vegetation along reaches of the Sacramento River Flood Control Project.
6. The USACE should consider implementing post-construction bathymetry to monitor changes in benthic habitat.

### **1.6. Reinitiation of Consultation**

Reinitiation of consultation is required and shall be requested by the USACE or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) the amount or extent of incidental taking specified in the ITS is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this biological opinion; or if (4) a new species is listed or critical habitat designated that may be affected by the identified action.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the action. This review was conducted pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.

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

The effects of the proposed action on Pacific salmon EFH will be similar to those discussed in the Effects of the Action section for Chinook salmon. Based on the information provided, NMFS concludes that the proposed action would adversely affect EFH for Federally managed Pacific salmon. Adverse effects to HAPCs are appreciably similar to effects to critical habitat; therefore, no additional discussion is included. Listed below are the adverse effects on EFH reasonably certain to occur. Affected HAPCs are indicated by number, corresponding to the list in the previous paragraph.

1. Sedimentation and Turbidity

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

2. Installation of Riprap

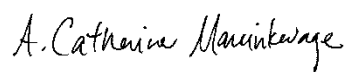
- Permanent loss of natural substrate at levee toe (1, 2, 3)
- Reduced habitat complexity (1, 2, 3)
- Increased bank substrate size (1, 2, 3)
- Increased predator habitat (1, 2, 3)

The terms and conditions and conservation recommendations in this biological opinion contain adequate measures to avoid, minimize, and serve to offset the adverse effects to EFH. Therefore, NMFS has no additional EFH conservation recommendations to provide.

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

Please direct questions regarding this letter to Ally Bosworth California Central Valley Office of NMFS at (916) 930-5617 or via email at [Allison.Bosworth@noaa.gov](mailto:Allison.Bosworth@noaa.gov).

Sincerely,



Cathy Marcinkevage  
Assistant Regional Administrator for  
California Central Valley Office

Enclosure

cc: To the File: ARN151422-WCR2021-SA00080