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In Reply Refer to:
2022-0003130-R004

March 21, 2025
Sent Electronically

Kevin Harper
Chief, Environmental Resources Branch
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814
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Subject: Reinitiation of Formal Consultation on the American River Common Features 2016 Project, Sacramento and Yolo Counties, California

Dear Kevin Harper:

This letter is in response to the U.S. Army Corps of Engineers' (Corps) request for reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed American River Common Features (ARCF) 2016 Project (proposed project) in Sacramento and Yolo Counties, California. Your request was received by the Service on October 28, 2024. The Corps has refined some of the project designs and is updating the project description and effects to listed species as well as adding the newly federally endangered longfin smelt (*Spirinchus thaleichthys*). At issue are the proposed project's effects on the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*), valley elderberry longhorn beetle (*Democerus californicus dimorphus*), (giant garter snake (*Thamnophis gigas*), and western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) delta smelt (*Hypomesus transpacificus*), and delta smelt designated critical habitat and the federally endangered vernal pool tadpole shrimp (*Lepidurus packardi*), and longfin smelt (*Spirinchus thaleichthys*). This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The federal action on which we are consulting is the Corps' ARCF 2016 Project, which includes levee improvements and bank protection along the Sacramento River, levee improvements along Arcade and Magpie Creeks, widening the Sacramento Weir, and bank protection along the lower American River. Pursuant to 50 CFR 402.12(j), you submitted a biological assessment for our review and requested concurrence with the findings presented therein. These findings conclude that the proposed project may affect, and is likely to adversely affect the valley elderberry longhorn beetle, the delta smelt and its critical habitat, the giant garter snake, and the yellow-billed cuckoo. The project is outside of critical habitat designated for the valley elderberry

longhorn beetle and the yellow-billed cuckoo. The findings also conclude that the proposed project may affect but is not likely to adversely affect the longfin smelt.

In considering your request, we based our evaluation on the following:

1) May 2024 Biological Assessment American River Watershed Common Features;

2) October 28, 2024 additional information letter; and

3) Various e-mails with project modifications provided between November 2024 and December 2024.

The Service concurs that the proposed project is not likely to adversely affect the longfin smelt. Potential habitat for longfin smelt will be affected with the placement of riprap along the left bank of the Sacramento River around river mile 47 to 53. Longfin smelt adults have been infrequently captured at the confluence of Cache Slough and the Sacramento River (river mile 15). The erosion protection work will occur 30 miles upstream of this location and at the edges of the range of the longfin smelt where take is unlikely to occur. Work will occur between July 1 and October 31 which is during the time that longfin smelt are downstream in the Suisun Bay. Construction of the Sacramento River Mitigation Site could affect longfin smelt when the proposed project breaches the berm to allow water to enter the newly created floodplain and channels. This work will also be done in the work window to avoid longfin smelt. Finally, the mitigation site for this project will also benefit longfin smelt by providing additional aquatic habitat. Based on these reasons the Service believe the proposed action may affect but is not likely to adversely affect the longfin smelt.

The remainder of this document provides our biological opinion on the effects of the proposed project on the valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, delta smelt and its critical habitat, giant garter snake, and yellow-billed cuckoo.

Consultation History

September 4, 2013:	The Service commented on the April 2013 draft biological assessment.
April 8, 2014:	The Service commented on the October 2013 draft biological assessment.
June 30, 2014:	The Corps initiated section 7 consultation with the Service.
July 23, 2014:	The Service sent a letter in response to the Corps initiation requesting additional information.
April 3, 2015:	The Corps provided an updated biological assessment with responses to the Service's July 23, 2014, request for additional information.
August 31, 2015:	The Corps provided a revised biological assessment that addressed questions the Service had regarding the project description.

September 11, 2015:	The Service provided the Corps with a biological opinion on the proposed project.
January 25, 2017:	The Corps reinitiated consultation with the Service.
June 8, 2017:	The Service provided an amended biological opinion to the Corps.
April 15, 2019:	The Corps reinitiated consultation with the Service to add geotechnical explorations.
June 17, 2020:	The Corps reinitiated consultation with the Service due to changes in project description and effects to listed species.
June 2020 – March 2021:	The Corps provided numerous e-mails and held numerous meetings to discuss changes to the project description and effects to listed species.
March 2021:	The Service provided an amended biological opinion to the Corps.
May 13, 2024:	The Service received a reinitiation request from the Corps on the Common Features project.
June 12, 2024:	The Service sent an letter to the Corps requesting additional information.
October 28, 2024:	The Corps provided the information requested in the June 2024 Service letter.
October 2024 – March 2025:	The Corps continued to provide information to the Service regarding effects to listed species to include in the biological assessment.

BIOLOGICAL OPINION

The purpose of this section 7 consultation is to evaluate the effects of the proposed action on listed species and designated critical habitat. After reviewing the proposed action with programmatic actions as proposed by the Corps, the Service has determined that the proposed action presents a programmatic action, as defined in 50 CFR § 402.2.

Description of the Proposed Action

Congress directed the Corps to investigate the feasibility of reducing flood risk to the city of Sacramento and surrounding areas. The Corps completed feasibility studies in 1991 and 1996, recommending a concrete gravity flood detention dam on the north fork of the American River at the Auburn site along with levee improvements downstream of Folsom Dam. Other plans evaluated in the report were Folsom Dam improvements and a stepped release plan for Folsom Dam releases. These additional plans also included levee improvements downstream of Folsom Dam. Congress recognized that levee improvements were “common” to all candidate plans in the report and that there was a Federal interest in participating in these “common features.” Thus, the ARCF Project was authorized in the Water Resources Development Act (WRDA) of 1996 and a decision on Auburn Dam was deferred to a later date. Major construction components of ARCF in the WRDA 1996 authorization included construction of seepage remediation along about 22 miles of American River levees and construction of levee strengthening and raising of 12 miles of Sacramento River levee in Natomas.

The following problems were identified within the Sacramento levee system:

- Seepage and underseepage;
- Levee erosion;
- Levee stability;
- Levee overtopping;
- Access for maintenance and flood fighting;
- Vegetation and encroachments;
- Releases from Folsom Dam;
- Floodplain management; and
- Additional upstream storage from existing reservoirs.

The project is designed to allow for the release of 160,000 cubic feet per second (cfs) from Folsom Dam. The levees along the American River are unable to withstand these maximum flows for extended periods of time without increased risk of erosion and potential failure.

The Corps' project involves the construction of fix-in-place levee remediation measures to address seepage, stability, erosion, and height concerns identified for the Sacramento River and American River levees, Natomas East Main Drainage Canal (NEMDC), Arcade, and Magpie Creeks. Most height concerns along the Sacramento River will be addressed by a widening of the Sacramento Weir and Bypass to divert more flood flows into the Yolo Bypass, thereby lowering water surface elevations downstream. Due to the urban nature and proximity of existing development within the American River North and South basins the Corps is planning fix in place remediation. This will improve the flood damage reduction system to safely convey flows to a level that maximizes net benefits. Table 1 summarizes the levee problems discussed above and the proposed measure for each waterway.

Table 1. Remediation by Waterway.

Waterway	Seepage Measures	Stability Measures	Erosion Protection Measures	Overtopping Measures
American River[1]	---	---	Bank Protection (31,000 linear feet), Launchable Rock Trench (45,000 linear feet)	---
Sacramento River	Cutoff Wall (50,300 linear feet)	Cutoff Wall (50,300 linear feet)	Bank Protection (43,000 linear feet)	Sacramento Bypass and Weir Widening, Levee Raise (1,500 feet)
NEMDC	Cutoff Wall (6,000 linear feet)	Cutoff Wall	---	Floodwall (15,600 linear feet)
Arcade Creek	Cutoff Wall (22,000 linear feet)	Cutoff Wall	---	Floodwall (22,000 linear feet)

Dry/Robla Creeks	---	---	---	Floodwall (2,500 linear feet)
Magpie Creek	---	---	---	Levee Raise (2,100 linear feet) and Training Levee (1,000 linear feet)

[1]American River seepage, stability, and overtopping measures were addressed in a previous construction project.

Sacramento Area Flood Control Agency (SAFCA), the project's local sponsor, will complete some portions of the Federal project. SAFCA is seeking permission from the Corps pursuant to 33 USC §408 (Section 408) for alteration of the Federal levees along the NEMDC and Arcade Creek.

In addition to the proposed levee improvements measures shown in Table 1, the following measures and policies will be addressed during construction:

- The Corps will apply a semi-quantitative risk assessment methodology to evaluate the placement of on-site mitigation vegetation.

- The non-Federal sponsor, Central Valley Flood Protection Board (CVFPB), will bring the levees into compliance with the Corps' standard levee footprint using a System Wide Implementation Framework (SWIF) process. A SWIF is a plan developed by the levee sponsor(s) and accepted by the Corps to implement system-wide improvements to a levee system (or multiple levee systems within a watershed) to address system-wide issues, including correction of unacceptable inspection items, in a prioritized way to optimize flood risk reduction. The standard levee footprint consists of a 20-foot crown width, 3 to 1 (height to vertical) (3H:1V) waterside slope and 2H:1V landside slope. There may be locations where a 3H:1V waterside slope design is not possible and, when possible. If the 3H:1V waterside slope is not possible, then a minimum 2H:1V waterside slope will be established with revetment.

American River

Levees along the American River require improvements to address erosion. For design and construction purposes, the lower American River is divided into 4 subreaches. The proposed measures for these areas consist of bank protection or launchable rock trenches with a maximum of 31,000 linear feet (LF) of bank protection, and a maximum of 65 acres/45,000 LF of launchable rock trench. These measures are being implemented to prevent undermining of the levee foundation. Typical designs are described below.

Bank Protection

This measure consists of placing rock revetment on the river's bank to prevent erosion and will consist of the following types of repairs.

Bank protection entails installing revetment along the stream bank based on site-specific analysis. When necessary, the eroded portion of the bank will be filled and compacted prior to the rock placement. The sites will be prepared by clearing and stripping of loose material and understory growth prior to construction. Where possible large woody vegetation will be left on-

site. Temporary access ramps will be constructed, if needed, using imported borrow material that will be trucked on site.

The placement of rock onto the bank will occur from a land-based staging area using long reach excavators and loader. The loader brings rock from a permitted source and stockpiles it near the levee in the construction area. The excavator then moves the rock from the stockpile to the waterside of the levee. A soil filled planting bench could be established on these rock surfaces for revegetation purposes.

The revetment will be placed on the existing bank at a slope varying from 2H:1V to 3H:1V depending on site specific conditions. Rock will be placed at the toe of the repair which is designed to launch at certain high flows to protect against toe erosion.

After revetment placement has been completed, where hydraulic stage impacts have been deemed acceptable and space allows, a soil-filled planting berm will be constructed on the repair site to allow for vegetation to be planted, outside of the vegetation free zone as required by the Corps. This vegetation will be designed on a site-specific basis in coordination with the Service and in such a way as to not impact the hydraulic conveyance of the channel.

Planting benches will provide on-site mitigation for juvenile salmonids contributing to their foraging and refuge habitat. The planting benches will provide adequate soil volume to establish native tree species. Design of the planting benches should include providing a variety of slopes both parallel and perpendicular to the river and a diverse planting pallet including trees, shrubs, and understory plants. Instream woody material in the form of small dead trees with intact roots will be placed at the lower elevations that are frequently inundated. The planting bench will terminate at the launchable toe where rows of willow stakes will be planted to stabilize the planting bench soil. During the initial plant establishment, planting benches will be protected with biodegradable erosion control fabric on the surface. The planting bench will be placed over a minimum two-foot thick layer of clean riprap. The launchable toe will be of sufficient volume to launch the riprap into scours that could develop along the natural river bottom during high flows.

Launchable Rock Trench

This measure includes construction of a launchable rock filled trench, designed to deploy once erosion has removed the bank material beneath it. All launchable rock trenches will be constructed outside of the natural river channel. The vegetation will be removed from the footprint of the trench and the levee slope prior to excavation of the trench. The trench configuration will include a 2H:1V landside slope and 1H:1V waterside slope and will be excavated at the toe of the existing levee. All soil removed during trench excavation will be stockpiled for potential reuse. The bottom of the trench will be constructed close to the summer mean water surface elevation in order to reduce the rock launching distance and amount of rock required.

After excavation, the trench will be filled with revetment that will be imported from an offsite commercial location. After rock placement the trench will be covered with a minimum of 3 feet of the stockpiled soil. Vegetation may be planted over the trench if it is planted outside of the vegetation-free zone. This vegetation will be limited to native grasses and woody vegetation with shallow root systems to ensure they do not limit the functionality of the trench during a flood event.

Cut Bank
This measure consists of excavating the channel banks to create stable slopes that could be planted with riparian vegetation to provide erosion protection along the channel margins and include the following potential activities.

The design is intended to be deformable vegetated bankline, which will allow small amounts of river processes such as erosion and accretion. The design will reduce the likelihood of erosion by reducing bank slope, creating planting areas on the lower slope at elevations observed to recruit and sustain natural riparian vegetation to increase slope stability and erosion resistance. Inclusion of launchable buried rock tiebacks will both protect the levee and the bank.

Velocity and Tree Scour Work

These two activities will protect against fluvial erosion and scour around trees and will include removing trees when necessary. The location of each native tree will be assessed to see if the alternative methods listed below could be used as erosion protection in place of tree removal. It is anticipated that only non-native trees or trees that cannot be saved using the methods below will be removed.

- About 2 feet of soil-filled revetment will be installed. This also may require about 5 feet of excavation below the surface of the ground for scour protection at the levee toe embankment. Some trees may not survive the excavation and may need to be removed. All this work is proposed to prevent erosion from velocities at 160,000 cfs.
- Smaller rocks will be placed above the ground around the trees to armor the trees from scour.

Sacramento River

Levees along the Sacramento River require improvements to address seepage, stability, and erosion. About 43,000 LF of bank protection and 50,300 LF of cutoff wall or slope stability work is proposed for the Sacramento River. In addition, these levees require a total of one mile of intermittent height improvements in order to convey additional flows that exceed current design levels.

Levee Raising

Where the existing levee does not meet the levee design requirements, as discussed above, slope flattening, crown widening, and/or a minimal amount of levee raise is required. This improvement measure addresses problems with slope stability, geometry, height and levee crest access and maintenance. To begin levee embankment grading, loose material and vegetation understory will be cleared, grubbed, stripped, and where necessary, portions of the existing embankment will be excavated to allow for bench cuts and keyways to tie in additional embankment fill. Excavated and borrow material (from nearby borrow sites) will be stockpiled at staging areas. Haul trucks and front-end loaders will bring borrow materials to the site, which will then be spread evenly and compacted according to levee design plans.

The levee will be raised about 1 to 2 feet resulting in the levee footprint extending out a maximum of 5 feet on the landside from the existing levee. The levee crown patrol road will be re-established at the completion of construction.

Cutoff Walls

To address seepage concerns, a cutoff wall will be constructed through the levee crown. The cutoff wall will be installed by one of three methods: (1) conventional open trench cutoff walls, (2) deep soil mixing (DSM) cutoff walls, and (3) jet grout cutoff walls. The method of cutoff wall selected for each reach will depend on the depth of the cutoff wall needed to address the seepage. The open trench method can be used to install a cutoff wall to a depth of about 85 feet. For cutoff walls of greater depths, the DSM method will be utilized.

Prior to any cutoff wall construction method, the construction site and any staging areas will be cleared, grubbed, and stripped. The levee crown will be degraded up to half the levee height to create a large enough working platform (about 30 feet) and to reduce the risk of hydraulically fracturing the levee embankment from the insertion of slurry fluids. This method of slurry wall installation will also reduce the risk of slurry mixture following seepage paths and leaking into the river or into landside properties.

Open Trench Cutoff Wall

Under the open trench method, a trench about 3 feet wide will be excavated at the top of levee centerline and into the subsurface materials up to 85 feet deep with a long boom excavator. As the trench is excavated, it is filled with low density temporary bentonite water slurry to prevent cave in. The soil from the excavated trench is mixed nearby with hydrated bentonite, and in some applications cement. The soil bentonite mixture is backfilled into the trench, displacing the temporary slurry. Once the slurry was hardened, it will be capped, and the levee embankment will be reconstructed with impervious or semi-impervious soil.

DSM Cutoff Wall

The DSM method involves a crane supported set of two to four mixing augers used to drill through the levee crown and subsurface to a maximum depth of about 130 feet. As the augers are inserted and withdrawn, a cement bentonite grout will be injected through the augers and mixed with the native soils. An overlapping series of mixed columns will be drilled to create a continuous seepage cutoff barrier. A degrade of up to one half the levee height will be required for construction of the DSM wall. For both methods, once the slurry has hardened it will be capped and the levee embankment will be reconstructed with impervious or semi-impervious soil.

Jet Grout Construction

Jet grout construction involves injecting grout into the soil at very high pressures and will be used in areas where there are utilities that cannot be removed such as the regional sewer line and Pacific Gas and Electric (PG&E) natural gas line near the Pioneer Bridge. The grout is a mixture of cement and water that will be mixed in a batch plant located in the staging area and transported through high- pressure hoses to the location of construction. The jet grout process involves drilling straight down into the levee to a depth of up to approximately 130 feet, then injecting grout into the hole through a high-pressure nozzle. As the grout is injected from the bottom to the top of the hole, the high pressure excavates the soil around the nozzle to a radius of 3 to 4 feet, mixing the soil within the levee with grout. The grout injection may be accompanied with air and water to assist the excavation of soil. The nozzle is rotated and lifted at a slow, smooth, constant speed to achieve thorough mixing and consistent quality. The grout then solidifies to create a column of low permeability. Multiple columns constructed together create a wall through the levee that prevents seepage. Soil that is displaced from the injection site will be piped into drying beds or containment cells located in the staging area for later disposal.

Jet grouting activities near Pioneer Bridge may occur 24 hours a day to expedite work which will generate noise and require night lighting.

Municipal Drainage Systems

Several municipal drainage systems, both legacy and operational, have pipes that run through the levee. These facilities require removal and replacement to install the cutoff walls. Temporary waterside access below the ordinary high-water mark of the river is required to remove or replace these structures. A small portion of the concrete apron will be placed as part of the Sump 70 replacement and will likely extend below the OHWM. Temporary access will consist of dewatering the area with the use of a sandbag cofferdam approximately five feet high (1.75 feet above the typical water level) and approximately 120 feet in length. The sandbag cofferdams will be installed, and work completed between July 1 and October 31, which is outside of sensitive fish species migration windows. A portion of the existing revetment will be sawcut and removed. Work to replace individual drainage facilities is estimated to take up to 15 days. There may be up to five areas where in-water work may be needed to remove or replace these pump systems throughout all Sacramento River east levee contracts.

Stability Berms and Blankets

Stability berms and blankets address shallow foundation and/or levee embankment through-seepage. A stability berm or blanket is a prism of compacted soil that acts as a buttress to increase stability factors of safety and, in some cases, includes an inclined filter/drain zone placed on the landside slope of a levee to capture seepage that will otherwise exist on and potentially erode the unprotected levee slope. Typical stability berms are 10-15 feet high (depending on the height of the levee) and 10-25 feet wide and are considered in limited areas that do not have substantial right of way issues. Alternatively, the stability berm can be constructed within the existing levee in areas with constrained access along the landside levee toe. The inset stability berm will be constructed by excavating the landside levee slope, constructing the filter/drain zone, and then rebuilding the levee slope to about the original grade with compact fill.

Relief Wells

Relief wells provide protection against levee underseepage by providing a path for underseepage to exist the ground surface at the landside toe of the levee without creating sand boils or piping levee foundation materials. Relief wells will be constructed near the levee landside toe to provide pressure relief beneath surficial fine-grained soils (clay or silt "blanket"). The wells will be constructed using soil-boring equipment to bore a hold vertically though the fine-grained layer. Pipe casings and filters will be installed to allow the pressurized water to flow to the ground surface in the well casing, thereby relieving the pressures beneath the clay blanket layers.

Toe Drains

The primary purpose of a toe drain is to divert through-levee seepage before it reaches the levee slope, where it could cause erosion and instability, and to filter the discharge in such a way as to reduce velocity and fine soil carrying capacity. A toe drain will typically be used when through-seepage or through-seepage driven landslide slope stability is problematic. Toe drains can be used in several limited reaches where the levee does not have an existing shallow cutoff wall and there is a concern regarding potential seepage breakout on the levee slope or the levee toe. Toe drains will be constructed by excavating into the levee prism and constructing a filtered drain within the waterside toe of the levee embankment.

Bank Protection

Proposed bank protection along the Sacramento River will address erosion concerns. Studies have shown that the Sacramento River levees have a medium to high risk of breach due to erosion. Bank protection will be addressed by standard bank protection with planting berm. The standard bank protection measure for the Sacramento River consists of placing rock protection on the bank to prevent erosion. This measure entails filling the eroded portion of the bank, where necessary, and installing revetment along the waterside levee slope and streambank from streambed to a height determined by site-specific analysis. Large trees on the lower half of the waterside slope will be protected in place to retain shaded riverine aquatic (SRA) habitat. The sites will be prepared by removing vegetation along the levee slopes at either end of the site for construction of a temporary access ramp, if needed. The ramp will then be constructed using imported commercial borrow material that will be trucked on site.

The placement of rock onto the levee slope will occur from atop the levee and/or from the waterside by means of barges. Rock required within the channel, both below and slightly above the water line at the time of placement, will be placed by a crane and/or excavator located on a barge. Construction will require two barges: one barge will carry the crane and/or excavator, while the other barge will hold the stockpile of rock to be placed on the channel slopes. Rock required on the upper portions of the slopes will be placed by an excavator located on top of the levee. Rock placement from atop the levee will require one excavator and one loader for each potential placement site. The loader brings the rock from a permitted source and stockpiles it near the levee in the construction area. The excavator then moves the rock from the stockpile to the waterside of the levee.

The revetment will be placed via the methods discussed above on existing bank at a slope varying from 2V:1H to 3V:1H depending on site specific conditions. After revetment placement has been completed, a small planting berm will be constructed in the rock to allow for some revegetation of the site.

Additional Measures

Additional bank protection measures may be considered and found to be appropriate during the implementation of site-specific designs. Design and analysis of any additional measures will be carried out during the site-specific planning and design phase. Examples of additional measures include, but are not limited to, toe protection, flow modification, cut bank, and alternative design and materials for reduction of riprap. These and other measures, which may be developed in the future, will be designed in coordination with the Service and National Marine Fisheries Service (NMFS) to minimize effects to listed species and their habitat from the proposed action and to ensure that the effects from these actions are covered in the effects of this biological opinion.

Natomas East Main Drain Canal

The east levee of the NEMDC requires 6,000 LF of improvements to address seepage and stability at locations where historic creeks had intersected the current levee alignment. A cutoff wall will be constructed at this location to address the seepage and stability problems. The cutoff wall will be constructed by one of the methods described in the Sacramento River section above. SAFCA is proposing to construct 2,500 LF of cutoff wall beginning just south of the confluence of Arcade Creek and extending south along the NEMDC. The Corps will construct the remaining 3,500 LF of cutoff wall.

Arcade Creek

The Arcade Creek levees require improvements to address seepage, slope stability, and overtopping when the event exceeds the current design. A centerline cutoff wall will be constructed to address seepage along 22,000 LF of the Arcade Creek levees. Levees from Rio Linda Boulevard to Marysville Boulevard will have a cutoff wall constructed at the waterside toe of the levee. Construction of the waterside toe cutoff wall will require constructing a work bench along the toe of the levee. Excavation for the bench will extend deep enough below existing grade to remove organic material and soft, unsuitable foundation soils. Bench excavation will also extend into the existing waterside slope of the levee as needed. Riprap will be placed on the waterside benches after construction of the waterside toe cutoff wall. Some portions of the Arcade Creek north levee will require more substantial excavation and reconstruction of the waterside slope to provide a low permeable seepage levee slope barrier. Bench fill material will be integrated with the slope reconstruction fill to provide an integral seepage barrier with the cutoff wall over the full height of the levee slope. A small section of levee will have a sheet pile cutoff wall at the centerline of the levee, rather than the waterside toe cutoff wall.

There is a ditch adjacent to the north levee at the landside toe which provides a shortened seepage path and could affect the stability of the levee. The ditch will be replaced with a conduit or box culvert and then backfilled. This will lengthen the seepage path and improve the stability of the levee. Additionally, pressure relief wells will be installed along the landside toe of the levee along the north levee west of Norwood Avenue.

Most of the Arcade Creek levees have existing floodwalls, however, there remains a height issue in this reach. A 1 to 4-foot floodwall will allow the levees to pass flood events greater than the current design level. The floodwall will be placed on the waterside hinge point of the levee and will be designed to disturb a minimal amount of waterside slope and levee crown for construction. The waterside slope will be re-established to its existing slope and the levee crown will grade away from the wall and be surfaced with aggregate base.

Magpie Creek Diversion Canal

The Magpie Creek Diversion Channel (MCDC) is located north of Interstate 80 and is bisected by Raley Boulevard. The project area is about 8,600 feet long. The MCDC moves water from the McClellan Business Park area to Robla Creek, then west into the Natomas East Main Drainage Canal (NEMDC). The NEMDC terminates in the American River, making it a part of the American River North Basin, one of the subbasins for the American River Watershed.

About 2,100 linear feet of levee will be raised from Raley Boulevard to 100 feet south of Vinci Avenue Bridge. The levee will be extended east of Raley Boulevard for 1,000 linear feet on the south side/left bank of the MCDC. A traffic crossing feature consisting of concrete culverts will be installed on Raley Boulevard. New maintenance roads will be constructed on top of the levee extension and on the north side/right bank of the MCDC east of Raley Boulevard.

From Vinci Avenue to Dry Creek Road, vegetation will be cleared from the canal and a new canal profile will be created. To maintain this new profile a maintenance road will be constructed on either side of the canal. Vegetation will be cleared in stages from the channel to allow for better water flow during high water events. Riparian vegetation will not be allowed to grow back within the canal. The canal is currently filled with mature riparian vegetation and aquatic plants.

The vegetation clearing from Dry Creek Road to the end of the levee extension, will remove a total of 2.75 acres of riparian habitat.

To reduce impacts the proposed project will create a buffer to protect the seasonal wetlands using temporary construction fencing, wire backed silt fence, multiple layers of an absorbent material such as straw waddles, and a final silt fence. A coffer dam will be installed and the water pumped out of the work site when work within the canal itself is necessary. This will be either a steel sheet pile or stone/soil coffer dam. There is a possibility for nightwork to be performed to reduce impacts for traffic from closing Raley Boulevard and shorten the construction schedule..

Staging is proposed at two sites. Site One (about 1.9 acres) is located in upland area but the parcel it is located within does have seasonal wetlands features such as swales that may need to be protected if the entire parcel is used. Site Two (about 1.25 acres) is a high ground location that is heavily disturbed and covered with invasive grass species.

Construction is anticipated to occur in 2026 - 2027 and will be completed in one construction season. Work is expected to start at the Northern Sacramento Bike Trail Bridge to construct the concrete culverts to improve downstream water flow. Maintenance roads will be constructed to allow access to the canal between Dry Creek Road and Vinci Avenue, followed by the excavation of the canal to widen and flatten the slopes to meet the new water conveyance requirements. A different set of concrete culverts that are a part of the traffic crossing feature may be constructed at this time. Canal realignment and widening between Raley Boulevard and Vinci Avenue and the levee construction east of Raley Boulevard will be the final portions of the project to be constructed.

Piezometer Installation

Piezometers will be installed permanently along the existing levees within the authorized footprint of the proposed project. The purpose of installing a piezometer network is to provide an empirical data collection system to provide real time data for water level within the levee to water resource managers, levee maintenance agencies, and project engineers. These installations could occur along the Sacramento River left bank, Lower American River left and right banks, Magpie Creek left bank, and Sacramento Bypass right bank that are all action areas of the proposed project. The distribution of piezometers will be based on the size of each construction zone and local hydrologic conditions. All piezometer installation locations will require pre-construction surveys for biological and cultural resources. About 100 piezometers will be installed along the levee segments listed above with piezometers on the levee crown and/or near the landside levee toe. Some areas may have higher concentrations of piezometers than other areas. On average, between 3 to 15 piezometers will be installed at each construction reach. There is an existing network of previously installed piezometers within the authorized footprint. Some of these existing piezometers may need to be replaced and/or require new sensors.

Sacramento Weir and Fish Passage Facility

The Sacramento Weir was completed in 1916. It is the only weir in the Sacramento River Flood Control Project that is manually operated; all others overflow by gravity on their own. It is located along the right bank of the Sacramento River about 4 miles upstream of the Tower Bridge, and about 2 miles upstream from the confluence with the American River. Its primary purpose is to protect the city of Sacramento from excessive flood stages in the Sacramento River channel downstream of the American River. The weir limits flood stages (water surface

elevations) in the Sacramento River to project design levels through the Sacramento/West Sacramento area. Downstream of the Sacramento Weir, the design flood capacity of the American River is 5,000 cfs higher than that of the Sacramento River. Flows from the American River channel during a major flood event often exceed the capacity of the Sacramento River downstream of the confluence. When this occurs, floodwaters flow upstream from the mouth of the American River to the Sacramento Weir.

A new 1520-foot fixed-crest passive weir structure will be constructed north of the existing Sacramento Weir. Additionally, a new bridge over the new weir will be constructed along Old River Road, a fish passage structure will be constructed in the new weir structure, a levee embankment will be constructed between the existing weir and the new weir, County Road 12 will be realigned, and the railroad embankment will be removed.

The California Department of Water Resources is implementing the Lower Elkhorn Basin Levee Setback project, which will widen the Sacramento Bypass by degrading the existing north levee of the Sacramento Bypass and constructing a new levee 1,500 feet to the north. This project was analyzed in a separate consultation (Service file # 2018-F-0479) and is not part of this project description.

The widening of the Sacramento Weir will result in stage increases of about 0.1 to 0.15 foot in the Yolo Bypass during the 1/100 and 1/200 annual exceedance probability (AEP) events and up to 0.3 feet during the 1/325 AEP event. These increases will not substantially change the area of the Yolo Bypass that will be inundated or substantially increase inundation depths in the bypass.

Due to operational criteria and system hydrology, the Sacramento Weir has historically not spilled on occasions when the Fremont weir was not already overtopping (i.e., the Fremont Weir always spills before the Sacramento Weir). Thus, under current conditions, the Sacramento Bypass has never been inundated by Sacramento Weir flood flows unless the Yolo Bypass was already inundated by flows over Fremont Weir Due to the volume of water that passed over the Fremont Weir, when the Fremont Weir spills and inundates the Yolo Bypass, some of the flow backs up and inundates the Sacramento Bypass. Additionally, because it takes an extended period of time for Yolo Bypass flows to drain back into the Sacramento River near Rio Vista, inundation in the Sacramento and Yolo Bypasses may persist for weeks or months after the weirs have stopped overtopping.

A change in operations will occur because the widened weir crest will be constructed at a lower elevation than the current weir. The lowered weir crest will result in the widened Sacramento Weir spilling more often, than current conditions. However, when the operation is modeled with the last 50 years of historical data, the proposed project will not substantially increase the frequency or duration of inundation in the Yolo Bypass.

<u>New Weir and Bridge</u>
A new 1,496-foot-long passive weir will be constructed along the right bank (looking downstream) of the Sacramento River, north of the existing weir. The new weir and existing weir will be separated by a levee embankment. The proposed weir will be composed of 60-foot-wide weir bays, separated by 3- to 5-foot-wide piers. A concrete approach slab and weir crest will form the floor between the piers. The weir crest elevation will be at 26 feet.

The new primary weir structure will be constructed behind the existing levee and Old River Road; therefore, only 1 year of in-water work is anticipated for the levee degrade, rock slope placement, and fish exit pool construction.

The existing levee, which will be in front of the new weir, once constructed, will be degraded in the final year of construction to create a graded approach to the new weir. The bank will be sloped back impacting 5.56 acres of riverine habitat and 2 acres of upland habitat which will result in 7.5 acres of riverine habitat once completed. The elevation of the graded approach to the new weir will be excavated down to an elevation of 22 feet. Once grading of the approach is completed, part of the area will be seeded with native perennial herbaceous species to stabilize the approach and protect it from erosion. Based on the proposed elevation of the approach, it is anticipated that this area will likely be inundated on an annual to biennial basis, given the OHWM is 2 feet higher than the proposed approach.

Once the graded approach is completed, areas that cannot be seeded due to erosion risk will have rock slope protection placed. Rock placed above the 10-foot contour will be 20 inches thick, while rock placed below this elevation will be 30 inches thick. A total of 18,358 cubic yards of rock are anticipated to be necessary. Placement of the rock will be achieved using an excavator staged from a barge or on land, and/or by bottom dumping rock from a barge. It may also be necessary to install a vibratory driven sheet-pile cofferdam to dewater the work area for installation of the rock slope protection. Turbidity will be controlled via a cofferdam, installation of a turbidity curtain, or other means and methods approved by the Regional Water Quality Control Board and NMFS.

Fish Passage Structure and Channel

The proposed action's fish passage design includes the following design elements:

- Hydraulic Control Structure and Fishway Exit Pool
- Fish Ladder
- Fish Passage Channel
- Stilling Basin Drain
- Transition of open channel fish way into Tule Canal.

Like the new weir, most of the fish passage facility will be constructed behind the existing Sacramento River and Tule Canal levees.

A fish passage channel begins at the downstream end of the flow control structure and runs parallel to the north wall of the fish ladder. Downstream, the channel turns to connect to the fish ladder entrance pool, then continues west, aligned with the fish ladder centerline. It may be necessary to install a vibratory driven sheet-pile cofferdam to dewater work area where relatively high groundwater levels may otherwise limit dry conditions for channel grading and shaping. The Bypass Transport Channel will extend to the Tule Canal. As the Bypass Transport Channel approaches the Tule Canal a segment of existing canal will be modified resulting in a change in the depth, shape, and alignment of the existing canal. A small amount of riprap will be placed where the Bypass Transport Channel discharges into the Tule Canal.

Fish monitoring will occur in both the Sacramento River and Tule Canal. Active construction monitoring will consist of deploying a hydro acoustic receiver array and acoustic positioning

systems. This technology is currently being utilized throughout the west coast and compliments other ongoing acoustic studies in the area. The array and positioning system will determine the fish's site fidelity and behavioral characteristics within the project area as construction activities are occurring. Pre-construction monitoring is anticipated to occur in the spring of 2020, using the acoustic array. Pre-construction monitoring is occurring to establish baseline conditions within the project/action area.

Fish monitoring will include the placement of up to 25 individual 14" diameter steel poles or pilings to be placed in the Sacramento River from RM throughout the ARCF action area in the Sacramento River. Minor pile driving activities are anticipated to occur. The purpose of the poles is for the placement/tethering of multi-functioning fish acoustic monitoring equipment, water quality monitoring equipment and an acoustic doppler current profiler. There will be navigation warning signs placed on top of each station. Monitoring will provide data for majority of the fish studies occurring within the Sacramento River.

Interior Drainage

A drainage ditch will be constructed north of the levee parallel to the proposed County Road 124. The new drainage ditch will include a culvert through the railroad embankment and will discharge to a drainage ditch being constructed through the Department of Water Resources' setback levee project.

Utility Relocation

Many utilities will be avoided; however, some utilities may need to be temporarily removed or relocated prior to construction. Temporary bypass pumping may be required for sanitary sewers. SAFCA and the construction contractors will coordinate with utility owners to manage the utilities in advance of construction. Disturbed utilities will be restored after construction consistent with CVFPB requirements.

Stormwater Pollution Prevention

Temporary erosion/runoff best management control measures will be implemented during construction to minimize stormwater pollution resulting from erosion and sediment migration from the construction, borrow, and staging areas. These temporary control measures may include implementing construction staging in a manner that minimizes the amount of area disturbed at any one time; secondary containment for storage of fuel and oil; and the management of stockpiles and disturbed areas by means of earth berms, diversion ditches, straw wattles, straw bales, silt fences, gravel filters, mulching, revegetation, and temporary covers as appropriate. Erosion and stormwater pollution control measures will be consistent with National Pollutant Discharge Elimination System (NPDES) permit requirements and included in a Stormwater Pollution Prevention Plan (SWPPP).

After completion of construction activities, the temporary facilities (construction trailers and batch plants) will be removed and the site will be restored to pre-project conditions. Site restoration activities for areas disturbed by construction activities, including borrow areas and staging areas, will include a combination of regrading, reseeding, constructing permanent diversion ditches, using straw wattles and bales, and applying straw mulch and other measures deemed appropriate.

Geotechnical Explorations

Geotechnical explorations include activities such as: geotechnical borings, erosion jet tests, geotechnical trenching, and geotechnical potholing. A brief description of each follows below.

Geotechnical Borings
Borings are done to determine the geologic composition of the foundation of various flood features (erosion protection, slurry walls, and Sacramento Weir). Each borehole will be about 4 to 6 inches in diameter and will be drilled to a depth of 50 to 100 feet. Equipment will include a tire-mounted drill rig, a support truck, and three crew trucks. Prior to initiating drilling, the workers will clear surface vegetation within the immediate borehole location (about 12 inches in diameter at each borehole). Woody vegetation will be avoided. Upon completion of each boring, the borehole will be backfilled with cement-bentonite grout. Drilling fluid and cuttings will be disposed of at an offsite location.

Erosion Jet Tests – Soil jet tests are used to classify erosion conditions along the waterside banks of the rivers. Tests will be conducted as close to the bank toe as feasibly possible. All jet tests will occur in the dry but may occur below the ordinary high-water mark. Two to six jet tests will be conducted at each site.

Geotechnical Trenching
This action involves digging trenches about 10 feet deep. The purpose of geotechnical trenching is to validate the composition of the levee embankment or other surface soil conditions. Additionally, trenching is often conducted in a similar manner as part of preconstruction geoarchaeological studies to determine the potential for presence of buried archaeological resources in the project area. Following site characterization, the trenches will be backfilled with soil.

Geotechnical Potholing
Geotechnical potholing is used when the purpose of the study is to determine the locations of pipes or other underground features that have the potential to be damaged by other techniques. The potholing is carried out using a vacuum truck to minimize potential damage to the utilities, and to biological resources. Any excess excavated material will be hauled offsite. All disturbed areas will be returned to their original state upon completion of each pothole.

Borrow Sites, Haul Routes, Mobilization, and Staging Areas

Borrow Sites
It is estimated that a maximum amount of borrow material is shown in Table 2 and will be needed to construct the ARCF Project. Detailed studies of the borrow material needs have not been completed. Actual volumes exported from any single borrow site will be adjusted to match demands for fill. Clean rock will be commercially acquired in order to construct the American and Sacramento River bank protection sites.

Borrow material will be obtained from locations on the project site that will undergo grade changes a part of project implementation, or from permitted offsite locations within 30 miles of the project site. Site selection will include the following criteria: avoidance of threatened and endangered species and their habitat, compatible with current land use patterns, and appropriate soil types. Fill may be borrowed from bank protection sites, when available, for the use of project-related mitigation.

Haul Routes

For construction of the enlarged Sacramento Weir, necessary aggregate base rock material will be obtained from a commercial sand and gravel operation, most likely in the Sacramento area, with majority of the riprap material to be transported by barge from quarries located within about 100 miles of the Sacramento Weir. The primary access to the Sacramento Weir project area will be from Interstate (I) 80 and Highway (Hwy) 50 via Harbor Boulevard and/or Reed Avenue, and then along Old River Road. The primary corridor for construction traffic will include temporary construction access roads, and local county roads.

For sites on the American River, haul routes will travel to the sites from either I-80 to the north or from Hwy 50 to the south and then through the residential neighborhoods utilizing various parkway access sites. Internal transfer dump trucks will utilize the top of the levee, the levee toe road, and bike paths to move material from the staging area where needed.

For the Sacramento River, rock will be acquired from a commercial source in the Bay Area and barged up the Sacramento River to the construction sites (see Table 2 for total barge trips estimated). Rock for the American River sites will be acquired from a commercial source within a 50-mile radius and will be hauled in trucks to the construction sites from either I-80 or Hwy 50 and through residential neighborhoods utilizing various Parkway access sites. Internal transfer dump trucks will utilize the top of the levee, the levee toe road, and bike paths to move material from the staging area to erosion repair sites.

Table 2. Barge Traffic Associated with Erosion Activities.

Activity	Total Number of Trips Modeled	Total Volume of Material Transported
Sacramento Weir and Bypass 2021	28 barge trips	25,000 cubic yards (cy)
Sacramento Weir and Bypass 2023	83 barge trips	75,000 cy
Sacramento River Erosion Contract 1	26 barge trips	23,000 cy
Sacramento River Erosion Contracts 2, 3* and 4	1,101 barge trips	1,000,000 cy

*Volume and trips are per year, there are likely to be 2 years of construction.

Mobilization

Mobilization will take place at each project site. Mobilization may include creation of temporary access roads, if needed; securing the site; and transporting equipment and materials to the site (e.g., clearing and grubbing, and construction of the repair). Access routes to construction sites will be primarily along existing roads, levee crown roads, or unpaved private farm roads. Barges will be used to transport rock to the sites on the Sacramento River. At several sites, a barge crane may be used to transport and stockpile rock and soil to the site.

Staging Areas

Staging areas will be selected so removal of trees and shrubs are minimized. Previously disturbed areas will be preferred. Landside staging areas may frequently be required for

stockpiling materials and equipment. Activities that will occur within staging areas will include storing necessary imported materials (e.g., rock, soil); parking, refueling, and servicing of construction equipment; establishing a temporary restroom; and parking construction staff transportation vehicles.

Construction Process, Sequencing, and Equipment

Site Preparation
Vegetation clearing may need to occur for site access and construction purposes. Site preparation may also include the removal of submerged wood and fallen trees within the construction footprint. A turbidity curtain or other Service and NMFS approved minimization measure will be installed prior to any in-water work conducted on the waterside of the levee where there is potential for listed fish. The work limits and staging areas will be fenced (orange construction fencing) to prevent vehicles and equipment from approaching the waterside edge of the existing bank (where applicable), to protect sensitive habitat, and to identify disturbance area limits.

Where necessary, existing vegetation within the work area will be removed during project construction except for trees or shrubs identified and marked for protection prior to construction. Trees within the repair area identified for protection and outside the work limit may require trimming or removal for equipment clearance, excavation, or due to severely undermined tree health. All tree and sensitive plant removal will be documented. The construction site may be cleared of grasses, ground cover, or any other undesirable materials, using mechanized equipment.

Construction Process
Rock or other fill material (eg., sand, soil, cobble) will be placed using a long-arm bucket excavator, barge crane, or other heavy equipment. IWM may be installed, if feasible, near the water surface during time of construction to replace or enhance riverine aquatic habitat to the repair area.

Demobilization, Rehabilitation, and Clean-up

Following construction, all equipment and materials will be removed from the work area and excess materials will be disposed of at appropriate facilities. All areas will be cleaned and cleared of rubbish and left in a safe and suitable condition.

Compensatory Mitigation

Elderberry Shrub Transplanting
Sites currently being pursued by the Corps, non-Federal sponsor, and local maintaining agency in coordination with the Sacramento County Parks, include, but are not limited to Rio Americano West and East, Glenn Hall, and Rossmoor. Additional sites are being investigated in anticipation of the full implementation of the proposed project. These sites will be used to transplant elderberry shrubs from erosion protection measures along the lower American River. Table 3 shows the size of the current known elderberry and riparian mitigation sites in the lower American River.

Site Elements
Each site will require temporary access for initial construction and mitigation site establishment activities and permanent access for long-term maintenance. Temporary activities include access

to the river or a well for irrigation pump facilities, and a staging area. Site fencing will be determined on a site-by-site basis. Irrigation will be available for at least the first three years. The elderberry shrubs will be removed using an excavator and transplanted in cluster groups of 3 to 12 shrubs. Maintenance of the sites during the establishment period will include irrigation, removal of non-native vegetation, and mowing.

Erosion Protection On-Site Mitigation

The incorporation of IWM, willow fascines, and plantings is being implemented to replace lost habitat. Entire almond or walnut trees with root balls and canopies may be used as IWM. The IWM will be placed at the waterside edge of the riparian bench and anchored into the quarry stone by the root ball. The fascines are anchored near the winter mean water surface elevation. Plantings will include an appropriate mix of local native riparian trees and shrubs and will occur at appropriate elevations.

Vegetation installation within the sites will be developed in coordination with the Service and NMFS during the design phase. A variety of materials for revegetation and site-enhancement may be used depending on the site-specific conditions. Below is a description of commonly used materials and methods used for revegetation purposes.

The incorporation of IWM functions to replace lost in-stream cover and habitat form construction impacts. Entire trees with root balls and canopies are used as the IWM. The trees shall be anchored into the quarry stone to one half of the tree length. They are placed to be submerged when fish are generally present in the area.

Willow fascines and pole cuttings are also incorporated into the site designs in order to replace lost in-stream cover and habitat due to construction. The fascines are anchored just below the winter mean water surface elevation at 15-foot triangular spacing. Pole cuttings will be planted in rows where the planting bench will terminate at the launchable toe to help stabilize the planting bench soil.

Table 3. Valley Elderberry Longhorn Beetle and Riparian Habitats

Site	Total Site Acreage	Mitigation Acreage	Temporary Work Acreages	Permanent Access Route Acreages	Plantable Acreage
Glenn Hall (RM 4.9 L)	17.28	8.71	1.33	0.83	5.72
Rio American West (RM 10.4 R)	12.88	5.32	1.84	2.24	3.33
Rio American East (RM 11.1 R)	5.67	2.44	0.43	0.52	2.13

Rossmoor West (RM 15.5 L)	43.70	21.61	3.60	0.94	15.88
Rossmoor East (RM 16.4 L)	12.77	6.07	0.86	1.04	4.68

Plant material installation is designed to mitigate for lost riparian habitat post construction. The proposed planting design includes an appropriate mix of local system native riparian trees and shrubs. Plantings will be incorporated into the sites at appropriate elevations to provide successful on-site mitigation.

American River Mitigation Site

The American River Mitigation Site (ARMS) Project is being designed to consider historical site conditions based on historic aerial images and adapt existing conditions to restore, enhance, and maximize habitat for the following species: salmonids, riparian birds, and the valley elderberry longhorn elderberry beetle. The acres restored are targeted at 79 acres for juvenile salmonid rearing habitat, 56 acres of riparian habitat, and up to 15 acres of elderberry shrub habitat for the valley elderberry longhorn beetle. The reconfigured site will continue to receive water from the American River via seepage as well as a new surface connection through a notch in the river embankment to allow entry/exit for salmonids into the created sinuous side channel. There is a possibility for nightwork to be performed to reduce impacts to traffic. This work will be a continuation of what happens during normal work hours and will not expand the footprint of the project. Due to the preexisting noise disturbance along Garden Highway at this location, this project work will not add a new impact via noise or physical disturbance.

The design will fill an existing off channel pond from past mining activities on the site and create a network of backwater channels that fills through a single inlet from the main river channel located at the southeast limit of the site. Habitat benches will be incorporated into the backwater channels to provide shallow water habitat at various water surface elevations. The benches will have gradual slopes and a positive gradient toward the main river channel to reduce stranding risks as water recedes.

Site design will include the creation of backwater floodplain habitats, removal of non-native vegetation and seed bank, incorporation of instream woody material (IWM), and improved connectivity to the main river channel. The site will be connected to the lower American River through a notch graded in the embankment of the main river channel. The import of material and grading to fill the mining pit in the floodplain is necessary create rearing habitat for salmonids by altering inundation depths and establishing elevations that provide an opportunity for wetland and riparian vegetation to establish and naturally recruit. The goal is for the habitat mitigation to blend in seamlessly with the surrounding riparian forest.

Site design refinements will continue to be coordinated with the Service to provide the best possible outcome for state and federally protected species as well as local residential wildlife.

Construction is currently anticipated to begin in 2025 and continue through 2027. Work will typically occur between 7 am and 6 pm Monday through Saturday. If necessary, night work will occur. In-water work in the American River main channel, not including areas of the man-made pond behind the river embankment, will be permitted within the annual NMFS-approved in-water work window for the proposed action. Most channel and riparian features will be completed before the right bank is breached to minimize any turbidity impacts on the river. Filling and grading within the existing man-made pond will include partial or complete dewatering to control water during fill operations and may require use of temporary cofferdams or inflatable bladders. A turbidity curtain and/or temporary sheet piles will be installed prior to making the hydrologic connection with the river. Revegetation will occur in the spring, after construction is complete, as early as 2026. Demobilization and cleanup will occur after construction. Trash, excess construction materials, and construction equipment will be removed.

The site will be accessed either from Garden Highway by Natomas Park Drive going through Discovery Park, or from Northgate Boulevard via the Riverdale Mobile Home Park access and existing operations and maintenance roads for overhead power lines within the site. Trucks will access the regional road network via Northgate Boulevard and/or Garden Highway, State Route-160, Interstate-5, or Interstate-80. Access to the site is controlled by a locking gate on Natomas Park Drive, but there are no existing access controls from Northgate Boulevard or Camp Pollock. Some road work such as tree trimming, or minor road repairs may be needed for access. Staging for site construction will occur within the site boundary or local vicinity. Staging areas will be fenced and will have security lighting. Staging areas will be used for material stockpiles, construction office and trailers, construction worker vehicle parking, and equipment staging. Haul traffic may also pass through staging areas. Staging areas will be subject to strict containment and spill prevention best management practices (BMPs) to help avoid Stormwater Pollution Prevention Plan (SWPPP) violations. Once work is complete, staging areas will be returned to their initial conditions or planted with native vegetation to provide additional habitat. Staging areas will avoid effects to listed species.

Sacramento River Mitigation Site (SRMS)

The Sacramento River Mitigation Site (SRMS) is intended to create 30 acres of salmonid/steelhead/green sturgeon, 30 acres of delta smelt habitat, and 17 acres of riparian habitat. Habitat creation will require breaching the existing perimeter berm, grading to create channels, stabilizing bank protection, and vegetation planting.

Revegetation will include a palette of native trees, shrubs, grasses, and aquatic vegetation. Aquatic vegetation should include native submerged and emergent wetland plants. The riparian vegetation will provide resting, foraging, roosting, and nesting habitat for numerous avian species, as well as the local terrestrial fauna. Riparian habitat will include willows, alders and cottonwoods when possible. Elderberry will be transplanted outside the construction footprint only when needed or protected in place.

The wetland habitat will provide sheltered slow-moving water, connectivity between open water and tidal marsh, food, and cover for native species. The wetland design will incorporate tidal marsh wetland with dendritic channels allowing for the daily exchange of the tidal prism within the site. Elevations and grading of tidal marsh features will slope so water recedes to not create fish stranding. Designs are currently between 35 and 65 percent complete. The project team has shifted toward locating the dredge material disposal site at the point of the island and having a single habitat area north of the access road. There will be around five habitat zones. Zone one is

open water this includes marsh transition with mudflat and emergent vegetation in elevations from less than 2 feet up to 7 feet. Zone 2 is low riparian with willow, button bush white alder in elevations from 7 to 9 feet. Zone 3 is middle riparian with willow cottonwood and maybe elderberry, elevations from 9 to 10 feet. Zone 4 is upper riparian includes alder, sycamore, and elderberry from 10 to 13 feet. Zone 5 is in elevation 13 feet and above and is upland comprised of oaks, sycamore, cottonwood, and elderberry. It is anticipated there will be one breach on Steamboat Slough to provide hydrologic connection onto the site.

The SRMS will be constructed over three construction seasons from 2025 through 2027, with revegetation to occur after site contouring is complete. Wetland vegetation will be planted and established for several months prior to breaching the berms to the adjacent water bodies. Work will typically be conducted between 7am and 6pm Monday through Saturday; however, work times may be extended, including potential night work, due to the site's remote location. A balanced cut-fill design for the wetland (excavation) and riparian habitat (fill for terracing) is an objective to minimize transport of fill and cost. The construction area is enclosed by a high berm, separating it from water in the adjacent sloughs and river. During the final phase of construction the coffer dams will be removed, connecting the new wetland, waterway, and riparian habitat to the river.

Vegetation grubbing, controlled burns for invasive species control, and tree removal will occur first. In-water work for aquatic beneficial use features along the outside perimeter of the sites and opening the berms to connect the wetland habitat to the adjacent waterbodies will occur within the annual NMFS-approved in-water work window for the proposed action. Demobilization and cleanup will occur in October and November of each year after construction is complete. The staging areas, landside berm slope, and any other bare earth areas will be reseeded with native grasses and forbs to promote revegetation and minimize soil erosion. Any roads or other access areas damaged by construction activities will be fully repaired and restored to preconstruction condition. Trash, excess construction materials, and construction equipment will be removed, and the site will be left in a safe and clean condition.

Site access and haul routes will be via Grand Island Road and maintenance roads within the site. From Grand Island Road, trucks and workers will access the regional road network via SR-160, SR-4, I-5, I-80, I-580, and I-680. Access to the site is controlled by locked gates at the turn off from Grand Island Road. Some work such as tree trimming, minor grading, paving, and adding aggregate may need to be done along the haul routes to allow access to the site. The staging areas will be located within the site boundary. Staging areas will be fenced and will have security lighting. Staging areas will be used for material stockpiles, construction office and trailers, construction worker vehicle parking, and equipment staging. Haul traffic may also pass through staging areas. Waterside staging areas will be subject to strict containment and spill prevention BMPs to help avoid SWPPP violations. Once work is complete, staging areas will be returned to their initial conditions or planted with native vegetation to provide additional habitat.

Operation and Maintenance

Operation and maintenance (O&M) of the levees in the Sacramento area are the responsibility of the local maintaining agencies, including the American River Flood Control District, DWR, and the City of Sacramento. The applicable O&M Manual for the Sacramento area levees is the Standard Operation and Maintenance Manual for the Sacramento Flood Control Project. Typical levee O&M in the Sacramento in the Sacramento area currently includes the following actions:

- Vegetation maintenance up to four times a year by mowing or applying herbicide.
- Control of burrowing rodent activity monthly by baiting with pesticide.
- Slope repair, site-specific and as needed, by re-sloping and compacting.
- Patrol road reconditioning up to once a year by placing, spreading, grading, and compacting aggregate base or substrate.
- Visual inspection at least monthly, by driving on the patrol road on the crown and maintenance roads at the base of the levee.
- Post-construction, groundwater levels will be monitored using the piezometers.

The Corps will work with local maintaining agencies to develop additional maintenance activities necessary for long-term operations and maintenance. This will occur during the preconstruction engineering and design phase of the project. The Corps will evaluate if these maintenance activities affects any Federally listed species and reinitiate section 7 consultation if there will be adverse effects to listed species.

Conservation Measures

Valley Elderberry Longhorn Beetle

- The Corps assumes complete avoidance of the valley elderberry longhorn beetle when a 100-foot (or wider) buffer is established and maintained around elderberry shrubs.
- When work will occur within the 100-foot buffer, a setback of 20 feet from the dripline of each elderberry shrub will be maintained whenever possible.
- During construction activities, all areas to be avoided will be fenced and flagged with as large as a buffer as possible.
- Signs will be erected every 50 feet along the edge of the avoidance area, identifying the area as an environmentally sensitive area.
- A qualified biologist will monitor the work area at appropriate intervals to ensure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project and will be coordinated with the Service.
- As feasible, all activities that will occur within 50 meters of an elderberry shrub, will be conducted outside of the flight season of the valley elderberry longhorn beetle (March through July).
- Any damage done to the buffer area will be restored.
- Buffer areas will continue to be protected after construction.
- Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants.

- Herbicides will not be used within the dripline of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method. Mechanical week removal within the dripline of the shrub will be limited to the season within adults are not active (August through February) and will avoid damaging the elderberry shrubs.

- Dust will be controlled by reducing speed limits to 10 miles per hour on unpaved roads, regularly watering roads, and wetting down soil and rock during grading operations and placement.

- Elderberry shrubs that cannot be avoided and that can be feasibly transplanted without safety concerns or detriment to the surrounding environment will be transplanted to an appropriate riparian area at least 100 feet from construction activities; see the 2017 Framework for further information.

- It is estimated that no more than 10 percent of the shrubs will not be transplanted due to water quality or safety of personnel. For shrubs that cannot be transplanted, all stems will be cut at ground level, collected, and distributed among the transplanted shrubs within the valley elderberry longhorn beetle conservation areas.

- Elderberry shrubs will be surveyed prior to construction to ensure that the actual effects match the estimated effects of this biological opinion. If the Corps will affect more valley elderberry longhorn beetle habitat than estimated than they will reinitiate consultation with the Service.

- Elderberry shrubs will be transplanted between November 1 and February 15, when shrubs are dormant.

- The Corps is proposing to compensate for effects to valley elderberry longhorn beetle through creation of compensation sites as described in the Service's 2017 Valley Elderberry Longhorn Beetle Framework and as below. The Corps will compensate at a 3:1 ratio for effects to valley elderberry longhorn beetle habitat. Tables 5 through 8 describe the calculated acreages and compensation. At the ARMS there are four elderberry shrubs that will be transplanted onsite to facilitate the restoration of the site. At the SRMS 1.0 acre of valley elderberry longhorn beetle habitat will be transplanted on site to allow for the restoration of the site. The transplanted elderberries will be maintained and monitored with the mitigation plantings.

Table 5. American River Elderberry Shrub Habitat and Compensation

Reach	Acreage/Amount	Compensation Ratio	Compensation Acreage
Subreach 2	2.84 acres elderberry shrubs[1] 8.07 acres associated riparian[2]	3:1	32.73
Subreaches 1, 3, and 4	4.27 acres elderberry shrubs[1] 13.71 acres associated riparian[2]	3:1	53.94

1 – There are about 300 to 400 individual elderberry shrubs
2 – This encompasses the riparian habitat within 25 meters of the elderberry shrubs

Table 6. Sacramento River Bank Stabilization Elderberry Shrub Habitat and Compensation

Acreage	Compensation Ratio	Compensation Acreage
0.12 acre elderberry shrubs[1] 2.69 acres associated riparian[2]	3:1	8.43

1 – There are about 300 to 400 individual elderberry shrubs
2 – This encompasses the riparian habitat within 25 meters of the elderberry shrubs

Table 7. Sacramento River Seepage and Stability Elderberry Shrub Habitat and Compensation

Number of Isolated[1] Elderberry Shrubs	Compensation Ratio	Compensation Credits/Acreage
40	2:1	80/3.31

1 – Given the linear nature of the work and the narrow width of the riparian habitat elderberry shrubs in this portion of the project will be compensated by a 2:1 ratio based on the number of shrubs that will be transplanted.

Table 8. Sacramento Weir Elderberry Shrub Habitat and Compensation

Acreage	Compensation Ratio	Compensation Acreage
0.69 acre elderberry shrubs[1] 2.05 acres associated riparian[2]	3:1	8.22

1 – There are about 300 to 400 individual elderberry shrubs
2 – This encompasses the riparian habitat within 25 meters of the elderberry shrubs

- If possible, elderberry shrubs will be transplanted during their dormant season (November through the first two weeks in February). If transplantation occurs during the growing season, increased mitigation will apply.

- The Corps is developing conservation areas to offset the transplantation, and loss of valley elderberry longhorn beetle habitat. Sites are being developed in the Lower American River and at the Beach Lakes Conservation Area along Morrison Creek. The Corps will find areas within the lower American River parkway which will either expand existing compensation areas or provide for connectivity between conserved valley elderberry longhorn beetle habitat areas. Sites within the lower American River parkway will be coordinated with Sacramento County Parks and the Service during the design phase of the project. Sites will be designed and developed prior to any effects to valley elderberry longhorn beetle habitat. The Corps will create 19.96 acres of riparian habitat which supports valley elderberry longhorn beetle within the lower American River parkway for the transplantation of elderberry shrubs. In addition, the local sponsors will create an additional 40 acres of land to benefit the valley elderberry longhorn beetle or purchase 40 acres of credits at a Service approved conservation bank to offset the loss of habitat due to trimming of elderberry shrubs along the lower American River, Sacramento River, Dry/Robla Creeks, Arcade Creek, Magpie Creek, and NEMDC. If off-

site compensation cannot be identified a portion of the compensation can purchase credits at a valley elderberry longhorn beetle conservation bank.

- Management of these lands will include all measures specified in the Service's Framework (2017) related to weed and litter control, fencing, and the placement of signs.

Giant Garter Snake

- Unless approved otherwise by the Service, construction will be initiated only during the giant garter snakes' active period (May 1–October 1, when they are able to move away from disturbance).

- Construction personnel will be given a Service-approved worker environmental awareness program.

- A survey for giant garter snakes will be conducted within 24 hours prior to construction beginning in potential giant garter snake habitat. Should there be any interruption in work for greater than 2 weeks, a biologist will resurvey the area within 24 hours prior to the restart of construction.

- Giant garter snakes encountered during construction will be allowed to move away from construction activities on their own.

- Movement of heavy equipment to and from the construction site will be restricted to established roadways. Stockpiling of construction materials will be restricted to designated staging areas, which will be located more than 200 feet away from giant garter snake aquatic habitat.

- Giant garter snake habitat within 200 feet of construction activities will be designated as an environmentally sensitive area and delineated with signs or fencing. This area will be avoided by all construction personnel.

- Habitat temporarily affected for one season (the 5.5 acre borrow site along the NEMDC and the 3.1 acres of aquatic and 32.7 acres of upland habitat associated with the fish passage channel located between the south Cross Canal and Tule Canal along the landside of the existing Sacramento Bypass North Levee) will be restored after construction by applying appropriate erosion control techniques and replanting/seeding with appropriate native plants and one year of monitoring. If for any reason the construction season in giant garter snake habitat extends into an additional active season, the Corps will replace the habitat on-site and purchase credits at a ratio of 1:1 at a Service-approved conservation bank in advance of the second construction season in suitable habitat.

- Habitat temporarily affected for more than three or more seasons will be restored and twice as much habitat will be created.

- Habitat permanently affected in the Sacramento Bypass in the form of 0.3 acre of drainage ditches and irrigation canals and 2.3 acres of surrounding upland habitat will be offset through the creation of the Bypass Transport Channel, which will create 6.7 acres of aquatic habitat.

- A biological monitor will be on-site during all ground disturbing activities at borrow site 2.

- Exclusionary fencing will be placed at least 10 days prior to the beginning of ground disturbing activities after May 1, to exclude giant garter snakes from entering areas where upland disturbance (borrow site 2) will occur during the active season (May 1 to October 1). Prior to fencing installation, the fence line will be mowed (with a minimum height of 6 inches) in order to conduct a surface survey of potential burrows. Fencing will be installed with a minimum of 6 inches buried in the ground and a minimum of 24 inches above ground. Fence staking will be installed on the inside of the exclusion area. One-way escape funnels will be installed every 50 to 100 feet and sealed along the fence line to provide an escape for any giant garter snake that may be within the exclusion area. The fencing will enclose the entirety of the site, or additional exclusionary fencing can be extended 200 to 400 feet beyond the proposed entrance area. The fencing will be inspected before the start of each workday and maintained by the contractor until completion of the project. The fencing will be removed only when project activities are completed.

Yellow-Billed Cuckoo

- Prior to construction, a Service-approved biologist shall conduct nesting bird surveys to determine the presence of nesting birds, including the yellow-billed cuckoo. If cuckoos are located the Service will be contacted to establish appropriate buffers. Surveys will be repeated if construction stops for a period of two weeks or longer.

- All vegetation removal shall occur between October 1 and March 1 outside of the cuckoo nesting season.

- Loss of riparian habitat that can serve as migratory stopover habitat for the yellow-billed cuckoo will be offset at a 2:1 ratio.

- Riparian habitat that is removed due to project construction will be mitigated within the American River parkway and at the Beach Stone Lakes compensation site. The Corps intends to expand existing conserved riparian lands within the parkway that could support the yellow-billed cuckoo. The design of replacement riparian areas will be coordinated with the Service to ensure that the habitat benefits both the valley elderberry longhorn beetles and yellow-billed cuckoo.

Delta Smelt

- The Corps is proposing to work outside of the delta smelt work window. In-water construction activities (e.g., placement of rock revetment) will be limited to the work window of July 1 through November 30.

- The Corps will purchase 90 acres of delta smelt credits from a Service-approved conservation bank or through the creation of a mitigation site to compensate for the loss of up to 30 acres of shallow water habitat due to the placement of riprap along the river bed and bank. If the Corps creates a compensation site instead of purchasing credits at a conservation bank, the site will be constructed and planted prior to the end of the construction of the Sacramento River sites.

- The Corps will create on-site mitigation in the form of riparian or wetland benches in the shallow water habitat zone. These sites will be developed in coordination with the Service and NMFS.

- The Corps will develop and implement a compensatory mitigation accounting plan to ensure the tracking of compensatory measures associated with the implementation of the proposed project.

- Erosion control measures (BMPs), including Storm Water Pollution Prevention Program and Water Pollution Control Program, that minimize soil or sediment from entering the river shall be installed, monitored for effectiveness, and maintained throughout construction operations to minimize effects to federally listed fish and their designated critical habitat.

- Screen any water pump intakes, as specified by NMFS and the Service screening specifications. Water pumps will maintain an approach velocity of 0.2 feet per second or less when working in areas that may support delta smelt.

- Minimize the removal of existing vegetation during project-related activities.

- The Corps shall include as part of the project, a Riparian Corridor Improvement Plan with the overall goal of maximizing the ecological function and value of the existing levee system within the Sacramento Metropolitan area.

Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

- Erosion control measures will be placed to avoid sediment going into adjacent wetlands. Additionally, construction fencing will be placed on the outside of wetlands so construction equipment avoids the wetlands.

- For every acre of habitat directly, at least three acres of vernal pool tadpole shrimp and fairy shrimp credits will be purchased at a Service-approved conservation bank prior to groundbreaking.

- If habitat is avoided (preserved) on site, then a Service-approved biologist (monitor) will inspect any construction-related activities at the proposed project site to ensure that no unnecessary take of listed species or destruction of their habitat occurs. The biologist will have the authority to stop all activities that may result in such take or destruction until appropriate corrective measures have been completed. The biologist also will be required to immediately report any unauthorized impacts to the Service.

Fencing will be placed and maintained around any avoided (preserved) vernal pool habitat to prevent impacts from vehicles. Additional Conservation Measures:

- A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the valley elderberry longhorn beetle, delta smelt, giant garter snake, and yellow-billed cuckoo, their habitats, the need to follow conservation measures, and the possible penalties for not complying with these requirements.

- The Corps will go through the design deviation process to limit vegetation removal prior to final design and construction phase for any contract.

- The Corps will include as part of the project, a Riparian Corridor Improvement Plan with the overall goal of maximizing the ecological function and value of riparian habitat within the existing levee system in the Sacramento Metropolitan area.

- Engineering designs will be modified to avoid potential direct and indirect effects.

- The Corps will include the Service and NMFS during the design of project components, including mitigation sites. This will include soliciting input and comments on designs and plans.

- The Corps will develop and implement a compensatory mitigation accounting plan to ensure the tracking of compensatory measures. The Corps will continue to coordinate with the Service during all phases of construction, implementation, and monitoring by hosting meetings. Additionally, prior to beginning construction, the Corps will provide a brief project description and describe the acres of listed species habitat effected and the amount of compensation for that contract that is being proposed.

- The Corps will develop, in conjunction with the Service and NMFS, interim management plans for mitigation sites. These will include performance standards that will be met. The Corps, in conjunction with the Service, NMFS, and the future maintainer, will develop long-term management plans for any mitigation that is developed as part of the project. Monitoring will occur for 8 consecutive years or as determined through the long-term management plan planning process. Annual monitoring reports will be submitted to the Service.

- Compensation areas will be protected in perpetuity and have a funding source for maintenance (endowment).

- Site access will be limited to the smallest area possible in order to minimize disturbance. Litter, debris, unused materials, equipment, and supplies will be removed from the project area daily. Such materials or waste will be deposited at an appropriate disposal or storage site.

- Designating a qualified biologist as a point-of-contact for any contractor who might incidentally take a living, or find a dead, injured, or entrapped threatened or endangered species. This representative shall be identified to the employees and contractors during an all employee education program conducted by the Corps. They shall have knowledge of the listed species that are discussed in this biological opinion.

- The Corps will provide an analysis of the launchable toe and buried rock trench, which shall evaluate the likelihood of the toe and trench launching. This analysis will also include the long-term durability of habitat which is established on the planting bench and the rock footprint of the launched buried rock trench. This analysis will be done by December 31, 2021. If long-term durability of the planting benches is diminished and the habitat will not be viable in perpetuity, then the Corps will work with the Service to offset effects to listed species due to this design feature.

- Stockpile all liquid chemicals and supplies at a designated impermeable membrane fuel and refueling station with a 100% containment system.

- Stockpile construction materials such as portable equipment, vehicles, and supplies, at designated construction staging areas and barges, exclusive of any riparian and wetland areas.

- Implement BMPs to prevent slurry from seeping out to the river and require piping systems on the landside of the levee.

- Immediately (within 24 hours) cleanup and report any spills of hazardous materials to the resource agencies. Any such spills, and the success of the efforts to clean them up, shall also be reported in post-construction compliance reports.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." For the proposed project, the action area encompasses the Sacramento River from the Sacramento Bypass downstream to River Mile 45, the lower American River from Arden Way to the confluence of the Sacramento River, Arcade Creek from Marysville Boulevard to the confluence of the NEMDC, the NEMDC from the south Dry Creek levee to just south of the NEMDC Arcade Creek confluence, the southern Dry Creek levee between Dry Creek Road and Rose Street, the borrow site along the NEMDC, and any borrow sites. Additionally, we are including a buffer of 300 feet from construction to account for effects to listed species due to dust and noise.

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means 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).

The jeopardy analysis in this biological opinion considers the effects of the proposed federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the condition of the species in the action area without the consequences to the listed species caused by the proposed action, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines all consequences to listed species that are caused by the proposed federal action; and (4) the *Cumulative Effects*, which evaluates the effects of future non-federal activities in the action area on the species. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and considering the status of the species, the Service formulates its opinion as to whether the proposed action is likely to jeopardize the continued existence of the listed species.

Analytical Framework for the Adverse Modification Determination

Section 7(a)(2) of the Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. A final rule revising the regulatory definition of "destruction or adverse modification" was published on August 27, 2019 (84 FR 44976). The final rule became effective on October 28, 2019. The revised definition states:

> "*Destruction or adverse modification* means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species."

The destruction or adverse modification analysis in this biological opinion relies on four components: (1) the *Status of Critical Habitat*, which describes the current rangewide condition of the critical habitat in terms of the key components (i.e., essential habitat features, primary constituent elements, or physical and biological features) that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the critical habitat overall for the conservation/recovery of the listed species; (2) the *Environmental Baseline*, which analyzes the condition of the critical habitat in the action area without the consequences to designated critical habitat caused by the proposed action, the factors responsible for that condition, and the value of the critical habitat in the action area for the conservation/recovery of the listed species; (3) the *Effects of the Action*, which determines all consequences to designated critical habitat that are caused by the proposed federal action on the key components of critical habitat that provide for the conservation of the listed species, and how those impacts are likely to influence the conservation value of the affected critical habitat; and (4) *Cumulative Effects*, which evaluate the effects of future non-federal activities that are reasonably certain to occur in the action area on the key components of critical habitat that provide for the conservation of the listed species and how those impacts are likely to influence the conservation value of the affected critical habitat. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and considering the status of critical habitat, the Service formulates its opinion as to whether the action is likely to destroy or adversely modify designated critical habitat. The Service's opinion evaluates whether the action is likely to impair or preclude the capacity of critical habitat in the action area to serve its intended conservation function to an extent that appreciably diminishes the rangewide value of critical habitat for the conservation of the listed species. The key to making that finding is understanding the value (i.e., the role) of the critical habitat in the action area for the conservation/recovery of the listed species based on the *Environmental Baseline* analysis.

Status of the Species

Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

For the most recent comprehensive assessment of the rangewide status of the fairy shrimp and tadpole shrimp, please refer to the *Vernal Pool Fairy Shrimp (*Branchinecta lynchi*), Vernal Pool Tadpole Shrimp (*Lepidurus packardi*), and Conservancy Fairy Shrimp (*Branchinecta conservatio*) 5-Year Review: Summary and Evaluation* (Service 2024). No change in either species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the review was finalized.

Valley Elderberry Longhorn Beetle

For the most recent comprehensive assessment of the species' range wide status please refer to the *Withdrawal of the Proposed Rule to Remove the Valley Elderberry Longhorn Beetle from the Federal List of Endangered and Threatened Wildlife* (Service 2014a). Threats discussed in the final document have continued to act on the species, with the loss of habitat being the most significant effect. The Service is currently working on a 5-year review for this species.

Delta Smelt

The Service listed the delta smelt as threatened on March 5, 1993 (Service 1993), and designated critical habitat for the species on December 19, 1994 (Service 1994). The delta smelt was one of eight fish species addressed in the Recovery Plan for the Sacramento–San Joaquin Delta Native Fishes (Service 1996). A 5-year status review of the delta smelt was completed on March 31, 2004 (Service 2004). The review concluded that delta smelt remained a threatened species. A subsequent 5-year status review recommended uplisting delta smelt from threatened to endangered (Service 2010a). A 12-month finding on a petition to reclassify the delta smelt as an endangered species was completed on April 7, 2010 (Service 2010b). After reviewing all available scientific and commercial information, the Service determined that re-classifying the delta smelt from a threatened to an endangered species was warranted but precluded by other higher priority listing actions (Service 2010c). The Service reviews the status and uplisting recommendation for delta smelt during its Candidate Notice of Review (CNOR) process. Each year it has been published, the CNOR has recommended the uplisting from threatened to endangered. Electronic copies of these documents are available at https://ecos.fws.gov/ecp/species/321. Please refer to the 2022 delta smelt Species Assessment and Listing Priority Assignment Form of the CNOR for the status of the species. Electronic copies of this document are available at https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/publication/4119.pdf (Service 2023).

Delta smelt is now considered a conservation-reliant species with most individuals completing a large majority of their life cycle in captivity at UC Davis' Fish Conservation and Culture Laboratory (FCCL; Lindberg *et al.* 2013). In December 2021, the Service, along with the CDFW, California Department of Water Resources, and U.S. Bureau of Reclamation, began experimentally releasing captively produced delta smelt into the Sacramento-San Joaquin River Delta in an experiment intended to help inform future supplementation of the species in the wild. For the past several years, most of the spawning population was composed of fish raised at FCCL. The actual numbers of fish released in each of the past three winters was 55,733 in Water Year (WY) 2022, 43,940 in WY2023, 91,468 in WY2024, and 124,946 in WY2025 (Service

unpublished). The actual number of spawning fish each year has likely been lower because some fish die before they finish maturing and start looking for opportunities to spawn. Because the delta smelt was nearly extirpated when experimental releases of captive-bred fish began in December 2021, it is unlikely that individuals without any FCCL ancestry still exist at this writing. This year's catch data do not indicate that the species' status has improved. Thus, the delta smelt now exists only as an integrated hatchery-wild population as envisioned in the Delta Smelt Supplementation Strategy (Service 2020).

Delta Smelt Critical Habitat

Legal Status

The Service designated critical habitat for the delta smelt on December 19, 1994 (Service 1994). The geographic area encompassed by the designation includes all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker Bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the existing contiguous waters contained within the legal Delta (as defined in section 12220 of the California Water Code) (Service 1994).

Conservation Role of Delta Smelt Critical Habitat

The Service's primary objective in designating critical habitat was to identify the key components of delta smelt habitat that support successful completion of the life cycle, including spawning, larval and juvenile transport, rearing, and adult migration back to spawning sites. Delta smelt are endemic to the Bay-Delta and the vast majority only live one year. Thus, regardless of annual hydrology, the Bay-Delta estuary must provide suitable habitat all year, every year. The primary constituent elements considered essential to the conservation of the delta smelt as they were characterized in 1994 are physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and juvenile transport, rearing, and adult migration (Service 1994). The Service recommended in its designation of critical habitat for the delta smelt that salinity in Suisun Bay should vary according to water year type, which it does. For the months of February through June, this element was codified by the SWRCB "X2 standard" described in D-1641 and the SWRCB's current Water Quality Control Plan.

The Service designated critical habitat for the delta smelt on December 19, 1994 (Service 1994). The geographic area encompassed by the designation includes all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker Bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the existing contiguous waters contained within the legal Delta (as defined in section 12220 of the California Water Code) (Service 1994). The Service's primary objective in designating critical habitat was to identify the key components of delta smelt habitat that support successful completion of the life cycle, including spawning, larval and juvenile transport, rearing, and adult migration back to spawning sites. Delta smelt are endemic to the Bay-Delta and the vast majority only live one year. Thus, regardless of annual hydrology, the Bay-Delta estuary must provide suitable habitat all year, every year. The primary constituent elements (PCEs) essential to the conservation of the delta smelt are physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and juvenile transport, rearing, and adult migration (Service 1994).

Summary of Status of Delta Smelt Critical Habitat

The Service's primary objective in designating critical habitat was to identify the key components of delta smelt habitat that support successful completion of the life cycle.

The delta smelt's critical habitat is currently not adequately serving its intended conservation role and function because there are very few locations that consistently provide all the needed habitat attributes for larval and juvenile rearing at the same times and in the same places (Table 1). The Service's review indicates it is rearing habitat that remains most impacted by ecological changes in the estuary, both before and since the delta smelt's listing under the Act. Those changes have stemmed from chronic low outflow, changes in the seasonal timing of Delta inflow, and lower flow variability, species invasions and associated changes in how the upper estuary food web functions, declining prey availability, high water temperatures, declining water turbidity, and localized contaminant exposure and accumulation by delta smelt.

Table 1. Summary of habitat attribute conditions for delta smelt in six regions of the estuary that are

	Landscape	**Turbidity**	**Salinity**	**Temperature**	**Food**
Montezuma Slough	Appropriate	Appropriate	Appropriate *when outflow is sufficient, or when the Suisun Marsh Salinity Control Gates are operated to lower salinity*	Usually appropriate	Appropriate
Suisun Bay (including Honker and Grizzly bays)	Appropriate except in shipping channel	Usually appropriate	Appropriate *when outflow is sufficient*	Usually appropriate	Depleted
West Delta	Limited area 4 to 15 feet deep	Marginal, declining	Appropriate	Can be too high during summer	Depleted
North Delta (Cache Slough region)	Appropriate	Appropriate	Appropriate	Can be too high during summer	Appropriate, but associated with elevated contaminant impacts
Sacramento River above Cache Slough confluence	Limited area 4 to 15 feet deep; swift currents	Marginal except during high flows, declining	Appropriate, but possibly lower than optimal	Usually appropriate	Likely low due to swift currents and wastewater inputs

South Delta	Appropriate except too much coverage by submerged plants	Too low	Appropriate	Too high in the summer	Appropriate

Giant Garter Snake

For the most recent comprehensive assessment of the species' range-wide status, please refer to the *Giant Garter Snake (Thamnophis gigas) 5-year Review: Summary and Evaluation* (Service 2020). No change in the species listing status was recommended in this 5-year review.

Western Yellow-Billed Cuckoo

For the most recent assessment of the species range-wide status please refer to the October 3, 2014, *Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (Coccyzus americanus occidentalis)* (Service 2014b). Ongoing threats to the yellow-billed cuckoo include habitat loss from flood control projects and maintenance, alterations to hydrology, climate change, and invasive species.

Environmental Baseline

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 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process. The impacts to listed species or designated critical habitat from federal agency activities or existing federal agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

The proposed project occurs along the mainstem Sacramento River from river mile (RM) 46 upstream to the American River confluence (RM 60), along the Sacramento north of the existing Sacramento Weir (RM 63), the lower American River from RM 0 to RM 11, and portions of the NEMDC, Arcade Creek, and Magpie Creek.

The Sacramento River in this part of the Sacramento Valley is moderately sinuous with the channel confined on both sides by man-made levees. The channel is a fairly uniform width and is not able to migrate due to the levees. Portions of the bank along the Sacramento River have had rock revetment placed to halt erosion of the bank and levees. Narrow bands of riparian habitat occur along the Sacramento River and tends to be comprised of cottonwoods, willows, buttonbush and box elder. Activities in this area consist mostly of maintenance of the levees and recreation consisting of walking, biking, and fishing. Wave wash erosion occurs from boaters in the Sacramento River.

The lower American River is not as constrained as the Sacramento River with portions of the levees set back from the river channel. This results in wider bands of riparian habitat, though there are sections where it is not continuous due to the levee being close to the river or to other land use such as golf courses which preclude native habitats. Non-native species such as black locust (*Robinia pseudoacacia*), tree of heaven (*Ailanthus altissima*), and red sesbania (*Sesbania punicea*) occur throughout the area. Recreation impacts the lower American River, particularly in the form of unauthorized camping which can result in the loss of vegetation and fires, which remove riparian vegetation.

The NEMDC, Arcade Creek, and Magpie Creek are all smaller waterways with levees adjacent to them. Riparian habitat is sporadic and, in some areas, completely missing. These creeks interface between urbanized areas and the open space of Sacramento County.

Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

Historical land use in the Magpie Creek Project was used for agriculture. In the early 1990s, the Corps investigated flood protection needs in the Magpie Creek area, compared detention basin and channel widening (channel plan) alternatives that included the former McClellan Air Force Base (AFB) (currently known as McClellan Business Park), and recommended the channel plan. Seasonal wetlands can be found along Magpie Creek. There are 20.84 acres of aquatic habitat suitable for the tadpole and fairy shrimps within 250 feet of the proposed projects footprint. Both vernal pool tadpole shrimp and vernal pool fairy shrimp have been observed within 0.5 mile of the action area (CNDDB 2025).

Valley Elderberry Longhorn Beetle

Habitat for the valley elderberry longhorn beetle occurs within riparian habitat along the Sacramento River, the American River, Arcade Creek and Sacramento Weir expansion footprint.

Sacramento River - Riparian habitat along the Sacramento River, south of the city of Sacramento, occurs in narrow bands along the riverbank and levee. Generally, an overstory layer is present, composed of cottonwood, sycamore, and oak trees. Shrubs occur as a mid-story layer including buttonbush, blue elderberry, white alder, and Oregon ash. Elderberry shrubs occur randomly along the reach of river proposed for improvements. The Corps has documented at 2.81 acres of valley elderberry longhorn beetle habitat and 40 individual shrubs that occur within the action area for erosion and seepage and stability work along the Sacramento River. Natural river processes of erosion and accretion effect elderberry shrubs which is the host plant of the valley elderberry longhorn beetle by eroding away bank and potentially elderberry shrubs. Levee maintenance can adversely affect elderberries within this stretch of the Sacramento River either by pruning or drift of herbicides used along the levee slope.

American River – Valley elderberry longhorn beetles have been identified along the lower American River Parkway in the CNDDB (2021). The Corps has designed and built six sites along the lower American River as habitat for the valley elderberry longhorn beetle. These sites extend from RM 0.9 up to RM 21. Bank protection along the lower American River will remove and transplant 28.89 acres of habitat for the valley elderberry longhorn beetle. Levee maintenance can adversely affect elderberry shrubs, though the largest threat to valley elderberry longhorn beetle is fires that have been started in the parkway and burned habitat that supports valley elderberry longhorn beetles.

Arcade Creek – Arcade Creek is dominated by grassland, with some areas of oak woodland and cottonwood forest. Two elderberry clusters of elderberry shrubs are located along Arcade Creek. Similar to elderberry shrubs along the Sacramento and American Rivers, these shrubs are subject to flood maintenance activities.

Sacramento Weir – At the Sacramento Weir expansion 2.82 acres of valley elderberry longhorn beetle habitat occurs within riparian habitat, along a railroad embankment. The Sacramento River is to the east of the embankment with a continuous canopy of trees extending to the river, but with very little understory and a walnut orchard to the west.

Delta Smelt

The portions of the Action Area that fall within the range of delta smelt include the Sacramento River east levee, south of Sacramento and the Sacramento Weir. Delta smelt typically migrate up into this area as early as December and move out in the spring and summer. The proposed project contains habitat components that can be used for feeding, spawning, rearing, and movement. According to a 2007 riprap database done for the Corps rock erosion protection currently exists between RMs 46 and 60 for a total of 19 miles, this includes both sides of the river. This section of the river is highly constrained with levees close to the river channel, which results in a good portion of the Sacramento River's bank is also in the levee template. The Corps' project will occur within 30 acres of delta smelt shallow water habitat.

Delta Smelt Critical Habitat

The erosion work along the Sacramento River will occur within critical habitat for delta smelt. These sites contain Primary Constituent Element #1, described above. The proposed project is occurring in the upper limits of the designated critical habitat, which includes potential spawning habitat. Sediment load in this portion of the Sacramento River is high and depending on the water year, sediment can drop out and cover areas with large amounts of cobble creating potential spawning habitat, or flush out accredited sediment and expose areas that are less suitable for spawning.

Giant Garter Snake

The proposed project is located within both the American Basin Recovery Unit (NEMDC borrow area) and the Yolo Basin Recovery Unit (ditch in the Sacramento Bypass) both are identified in the *Recovery Plan for the Giant Garter Snake* (Service 2017). Habitat within the proposed project occurs within the NEMDC and in the enlarged Sacramento Bypass. A borrow site located adjacent to the NEMDC in the southern part of the Natomas basin is upland giant garter snake habitat. The borrow site is on the southern edge of the agricultural lands and developed land interface. The NEMDC near this borrow site is an aquatic feature with large open areas of grassland that can serve as upland habitat for the giant garter snake. A snake observed 0.5 mile to the west of the NEMDC along Elkhorn Boulevard in 1996 (CNDDB 2021). Borrow site 2's northern boundary is Elkhorn Boulevard on the east side of the NEMDC. Giant garter snakes could be using the NEMDC for aquatic habitat and the surrounding grasslands for uplands.

Snakes have been located within the Yolo Bypass within 2 miles of the Sacramento Bypass. Numerous irrigation and drainage canals exist which provide connectivity from the Sacramento Bypass and areas that are known to support snakes in the Yolo Bypass. The canal segment

between the southern cross canal and the Tule Canal that will be modified as a result of construction of the Bypass Transport Channel contains about 38.4 acres of giant garter snake habitat (3.4 acres of aquatic habitat and 35 acres of upland habitat).

Western Yellow-Billed Cuckoo

Riparian habitat along the Sacramento River is narrow and linear. This habitat is not wide enough to support a nesting pair of cuckoos. Yellow-billed cuckoos use riparian habitat for foraging and nesting. Larger habitat patches exist within the lower American River. There are 65 acres of riparian habitat along the Lower American River that yellow-billed cuckoos could be using in the project area. The Corps will remove 110 acres of riparian habitat along the Sacramento River and disturb an additional 50 acres of riparian habitat by removing the understory and placing rock around the large trees. Riparian habitat exists landside of the levee at the Sacramento Weir extension. There are 13.74 acres of riparian that the cuckoo could use during migration at the Sacramento Weir extension.

Effects of the Action

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action.

Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

There are 20.84 acres of seasonal wetlands and vernal pools within 250 feet of the construction footprint along Magpie Creek, all of which is considered potential habitat for the two vernal pool crustaceans. Conservation measures such as the use of erosion control measures and fencing will avoid effects to 12.16 acres of vernal pools and swaless. Of the remaining 8.68 acres, 0.56 acre will be permanently lost with the placement of fill and grading for levee raises and maintenance road construction. The remaining 8.12 acres of vernal pool crustacean habitat will be subject to temporary effects due to their hydrological connection to the habitat being filled. It is expected that a small amount of sediment may migrate into these hydrologically connected habitats. This will be minimal given that the lowest points of these features are being filled and any sediment will not move upgradient.

As noted previously in the *Description of the Proposed Action* section, the Corps has proposed a set of conservation measures, including the commitment to purchase 1.68 acres of vernal pool species credits at a Service-approved conservation bank as part of the action. This compensatory habitat is intended to minimize the effect on the species of the proposed project's anticipated incidental take, resulting from the permanent loss of habitat described above.

This component of the action will have the effect of protecting and managing lands for the species' conservation in perpetuity. The compensatory lands will provide suitable habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. Providing this compensatory habitat as part of a relatively large, contiguous block of conserved land may contribute to other recovery efforts for the species.

Valley Elderberry Longhorn Beetle

Vegetation removal, including elderberry shrubs can cause mortality of any beetle larvae within the elderberry shrub. Transplanting the shrubs between November 1 and February 15, when the shrubs are dormant, will minimize the likelihood of killing larvae within the shrub. However, with transplantation there is no guarantee that the shrub will live which will result in both the death of any larvae in the shrub and the loss of habitat for the beetle. Proper care of the transplants through watering in the initial years can minimize this loss and increase the likelihood that the shrub will survive and provide habitat for the valley elderberry longhorn beetle.

The Corps is avoiding many elderberries along the lower American River and Sacramento River. Elderberry shrubs along the Sacramento River are being avoided with at least a 20-foot buffer from the dripline. On the lower American River 8.34 acres of valley elderberry longhorn beetle riparian habitat will have construction occurring within 20 feet of the dripline of elderberry shrubs, but the shrubs will be protected in place. Construction and geotechnical studies that occur near elderberry shrubs that will be protected in place can kill adult beetles if construction equipment is operating between the months of March and July when valley elderberry longhorn beetles have emerged from the elderberry shrubs, are locating mates for reproduction, and laying eggs on the elderberry shrubs. Fencing the area which contains riparian habitat, specifically elderberry shrubs, will minimize the likelihood of killing an adult beetle, but given the large amount of construction that will be occurring, the project will cause mortality to adult beetles.

The linear nature of this project could result in a loss of habitat connectivity for the valley elderberry longhorn beetle, which will affect the long-term viability of the beetle in the lower American River and along the Sacramento River because the beetle is a poor disperser. A large number of elderberry shrubs are being transplanted out of the construction footprint. Because final designs have not been completed for all of the bank protection work, the Corps is including the Service in the design process as well as in the selection and design of mitigation sites. Sites will be selected that increase both habitat connectivity as well as habitat patch size. Fulfilling recovery actions in the Valley Elderberry Longhorn Beetle Recovery Plan will be considered when selecting mitigation sites.

Overall, the Corps is impacting the following amount of elderberry shrub habitat : 28.89 acres along the lower American River; 2.81 acres along the Sacramento River for bank protection; 2.74 acres at Sacramento Weir; and 40 individual shrubs along the Sacramento River for seepage and stability. The 40 individual elderberry shrubs were not associated with riparian habitat and the Corps is proposing to offset adverse effects through the creation of 3.31 acres of valley elderberry longhorn beetle habitat. The Corps is proposing to offset the loss of 34.44 acres of beetle habitat through the creation of 84.94 acres of valley elderberry longhorn beetle habitat primarily along the lower American River, Sacramento River Mitigation Site, and at the Stone Lakes Conservation site, with up to 8.22 acres protected at a valley elderberry longhorn beetle conservation bank. Restoration of the American River Mitigation Site and Sacramento River Mitigation Sites will result in the removal of 1.0 acre of valley elderberry longhorn beetle habitat. The elderberry shrubs within this habitat will be transplanted to areas where riparian restoration will occur. Take of the beetle is likely due to transplantation, though the Corps will transplant shrubs during the dormant season and maintain and water them along with the remainder of the mitigation on the sites. These components of the action (the creation and

protection of valley elderberry longhorn beetle habitat and the purchase of bank credits) will have the effect of protecting and managing lands for the species' conservation in perpetuity. The compensatory lands will provide suitable habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. Providing this compensatory habitat in a way that provides relatively large, contiguous blocks of conserved land may contribute to recovery efforts for the valley elderberry longhorn beetle.

Operations and Maintenance - The Corps has proposed to evaluate effects to listed species including valley elderberry longhorn beetle when long-term maintenance activities for the Lower American River and Sacramento River can be described. Therefore, this biological opinion does not address effects to the valley elderberry longhorn beetle from any long-term levee maintenance activities.

Delta Smelt

Construction along the Sacramento River will place bank protection along a total of 43,000 non-contiguous linear feet (total of 8.14 miles) sections of the left bank of the Sacramento River. This will result in the majority of this section of river having rock bank protection placed on it. Delta smelt are a pelagic species typically associated with open water. However, as described in the status of the species they do spawn on sandy beaches in shallow water habitat. Suitable spawning habitat in this portion of the Sacramento River is present along the riverine edge of the left bank where proposed activities will occur. The rock footprint and other construction related activities below the mean high-water mark will change the substrate up to 43,000 linear feet (30 acres of shallow water habitat).

In-water construction activities (July 1 through October 31) will avoid the adult migration season and exposure to the adult spawning, incubation *(i.e.*, eggs/embryos), and larval transport from heavy equipment such as barges and cranes. Infrequent detection of larger juveniles in beach surveys suggests that the Sacramento River serves as a spawning ground and not as a nursery ground (Service 2020). Therefore, the early start of construction of July 1 in this section of the Sacramento River, while has the potential to effect individuals, this will be a small number of individuals. The bulk of the work will be completed during the August 1 to November 30 work window that typically avoids effecting individual delta smelt.

Effects due to increasing sediment downstream of the work area will be minimized through the conservation measures involving monitoring water quality during construction to ensure that effects do not extend into the portion of the Delta that delta smelt occupies during the late summer/fall period.

Construction to widen the Sacramento Weir will involve excavation of 5.56 acres of riverine habitat and roughly 2 acres of excavation of the upper bank. Once completed there will be 7.5 of riverine habitat with natural substrate. Only 1 acre of riprap will be used in this area immediately around the fish passage channel to limit erosion. The 7.5 acres of riverine habitat will be available to delta smelt the following year, resulting in no loss of habitat available to the delta smelt.

The primary adverse effect of the project is on potential spawning habitat is the modification of substrate within the shallow water zone (*e.g.*, sand to riprap). Rock used for bank protection is large enough to retard erosional forces of the river and therefore has interstitial spaces. Should delta smelt spawn over this riprap substrate, it is very likely that any eggs will fall into these

interstitial spaces resulting in the loss of eggs and potentially causing fertilization to not occur if the eggs fall into the interstitial spaces. Rock slope protection limits the lateral mobility of a river channel, increases flow velocities (Sedell et al. 1990), limit sediment transport, and eliminates bankside refugia areas (Gregory et al. 1991). Rock placement can also affect primary productivity through the loss of vegetation. The Corps will protect large trees in place and plant riparian benches at the conclusion of the rock placement to replace some of the loss of vegetation. Planting benches and vegetation planting will help to offset the increased velocities that the bank protection sites will experience due to the smoother rock surface. Current designs of the sites have a launchable toe, which is designed to provide protection against toe erosion. Because this is a feature that could move in the future, the Corps has committed to analyzing the likelihood and effects to the on-site planting bench if the toe rock launches. If it is found that the launch of the toe rock will affect the long-term viability of the on-site mitigation, the Corps will consult with the Service to determine how the launchable toe could affect the delta smelt and its critical habitat and reintitiate consultation if necessary.To offset the loss spawning potential and the loss of riverine edge habitat the Corps has proposed to purchase credits at a Service-approved delta smelt conservation bank, as well as completing on-site mitigation and off-site mitigation at the Sacramento River Mitigation Site. The total amount of mitigation will result in the creation and protection of up to 90 acres of delta smelt habitat for the effects to up to 30 acres of shallow water habitat..

From a temporal perspective it is assumed that mitigation will be in place and available to the species by the end of construction, assuming construction will be done by 2028. Construction of the mitigation site at Sacramento River Mitigation Site will have minimal effects to delta smelt since effects will be limited to the 1.21 acres where the breach in the berm will occur. Potential for construction-related turbidity will be minimized by creating the channels and marshes prior to breaching the berm and allowing water into the site. This will reduce impacts to protected fish species by allowing releases of turbid water to occur when the species are least likely to be present or adequate water flow is present to dilute dissolved materials being washed into the waterway. An inflatable bladder dam or a solid coffer dam may be needed during construction of the SRMS site to either prevent water intrusion from the Sacramento River or turbidity escaping the site. Long-term the site will provide up to 35 acres of new habitat for the delta smelt. The Corps is coordinating with the Service on the development of mitigation. If they find that mitigation will not be completed by 2028 they will work with the Service to determine what the effects to delta smelt will be and reinitiate consultation as appropriate.

The proposed conservation plan of the action will have the effect of protecting and managing lands for the species' conservation in perpetuity. The compensatory lands will provide suitable habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. Providing this compensatory habitat in a way that provides relatively large, contiguous blocks of conserved land may contribute to recovery efforts for the delta smelt.

Operations and Maintenance - The Corps has proposed to evaluate effects to listed species including delta smelt when long-term maintenance activities for the Sacramento River can be described. Therefore, this biological opinion does not address effects to the delta smelt from any long-term levee maintenance activities.

Delta Smelt Critical Habitat

Implementation of the proposed project will affect PCE #1 Physical Habitat as described under the environmental baseline section above. The placement of rock or other construction activities under the mean high-water mark will change the substrate of shallow water habitat for 30 acres. Any loss of shallow water habitat will be compensated through the purchase of credits at a delta smelt conservation bank, creation of on-site shallow water planting benches, or a Service-approved mitigation site. Creation of on-site benches can minimize and mitigate effects to delta smelt critical habitat if they are in the shallow water habitat zone and accessible to delta smelt during the spawning season. Previous erosion repair sites have accreted sandy soils on the benches which will be available to the delta smelt for spawning. This will not be available every year given it is dependent on the Sacramento River flows. A Conservation Measure which includes the Service in the development of the plans for the planting benches will ensure that the benches can provide habitat for the delta smelt. It is expected that planting portions of the sites post-construction will replace loss of primary productivity within the Sacramento River water column. On-site mitigation will be determined on a site-by-site case in consultation with the Service. The current discussion of off-site mitigation includes sites which are not currently connected to the river, through some sort of levee breach. This will open up new potential spawning habitat to the delta smelt within critical habitat.

Giant Garter Snake

Borrow Site 2 – Upland habitat for the giant garter snake will be disturbed at borrow site 2 (5.5 acres) when heavy equipment is brought in to remove soil for the Arcade Creek levee repair. Removal of soil from the site will result in the crushing of burrows that snakes use for aestivating and thermoregulation. Fencing the borrow site prior to borrow excavation will minimize the likelihood that snakes will be in the borrow site when construction equipment begins to mobilize. Fencing the site will temporarily (one active season) exclude the use of the area for giant garter snake. This could result in snakes having to move further distances to find upland refugia in the summer months and expose them to predation or other sources of mortality such as being run over by a vehicle on the levee road on the opposite side of the NEMDC. About 1.2 acres of aquatic habitat for the giant garter snake will be unavailable to the snake for up to 3 months during the snake's active season due to dewatering. Since snakes use aquatic habitat to forage for food, thermoregulate, and evade predators, the loss of this 1.2 acres will negatively affect the giant garter snake. Snakes will have to find alternative areas to forage in during these 3 months which could leave snakes more vulnerable to predation as they move to other areas for foraging.

Upon completion of the project, the site will restored and re-graded to create three habitat types. The 0.4 acre of freshwater marsh will provide a small increase in habitat along the bank during the summer months when the snake is active and will provide cover, an area for prey production, and refugia from predators. Additionally, the seasonal wetland bench will only provide aquatic habitat in the winter months when the snake is typically in burrows. The wetland bench will provide some upland habitat for the giant garter snake during the summer when the snake is active in the form of basking habitat and if dried wetland vegetation remains, some refugia from predators. However, because the site will be flooded in the winter it will not serve as overwintering habitat for the snake. The remaining 3.5 acres of the borrow site will be restored to native grassland and will function as summer upland refugia and basking habitat and in the winter serve as overwintering habitat for the snake.

Sacramento Bypass – Enlarging the Sacramento Bypass and Weir will result in temporary effects to giant garter snake habitat. Geotechnical borings will be conducted during the active season of the snake and will be done in a manner that tries to avoid areas where giant garter snakes may be underground in burrows. Creation of the Bypass Transport Channel will result in temporary effects to 2.3 acres of aquatic habitat and 32.7 acres of upland habitat. An additional 0.3 acre of aquatic and 3.1 acres of upland habitat will be permanently affected through the filling of a section of canal. Construction effects will result in the project area being unavailable to the giant garter snake for one year. Construction equipment and earthmoving activities will result in collapsing of burrows and crushing of snakes that are in the project area. Upon the one year completion of this portion of the project there will be an additional 6.7 acres of aquatic habitat available to the giant garter snake. Water availability should be similar to existing conditions with agricultural drainage providing a water source in the summer months when the snake is active. Conservation measures including working during the snake's active season will minimize the amount of individuals that could be killed or injured.

Operation of the expanded Sacramento Weir and Bypass will result in an increase of water surface elevation of approximately 0.5-foot on the levee slopes on either side of the Yolo Bypass. However, when this increase occurs, during a 200-year flood event, the Yolo Bypass levees already contain water up to 21 feet deep. As a result, giant garter snake burrows will likely already be saturated before the additional water associated with the widened Sacramento Bypass is a factor. The additional 0.5-foot resulting from this action will not significantly change the timing or duration of this flooding and will not result in further impacts to giant garter snake habitat.

The Corps has proposed to evaluate effects to listed species including giant garter snake when long-term maintenance activities for the Sacramento Bypass can be described. If maintenance activities will affect giant garter snakes the Corps will reinitiate consultation with the Service. Therefore, this biological opinion does not address effects to the giant garter snake from any long-term levee maintenance activities.

Yellow-Billed Cuckoo

Sacramento River – The Corps is planning on removing 70 acres of riparian habitat along the Sacramento River. The riparian corridor in this section of the Sacramento River is narrow (about 100 feet wide) because the levees were constructed so close to the edge of the channel bank. This bank of riparian habitat is too narrow for the yellow-billed cuckoo to nest; however it is possible for the yellow-billed cuckoo to use the habitat as a stopover when migrating to the Central Valley to breed. Vegetation removal under the proposed project will reduce the width of the riparian corridor from 100 feet to 40 feet on average. The Corps proposal to plant the bank protection sites will create at least a 25-foot-wide soil filled planting berm. Similar to the discussion above under delta smelt effects, these planting benches will have a launchable rock toe that could deploy over the life of the project. The study the Corps is currently undertaking will determine the likelihood and effect to the planting bench. If it is found that the launch of the toe rock will affect the long-term viability of the on-site mitigation, the Corps will consult with the Service to determine the effects to the yellow-billed cuckoo and its habitat. The Corps proposes to offset the loss of the 70 acres of riparian habitat through creation of habitat on-site and the creation of up to 140 acres of riparian habitat along the lower American River. The Corps is including the Service in the development of the mitigation sites such that they can be sited and designed to create riparian habitat that will benefit the yellow-billed cuckoo.

American River – The construction of launchable rock trench and bank protection will remove up to 65 acres of riparian habitat along the lower American River. While large patches of riparian habitat will not be removed (only a strip will be removed adjacent to the levee), the removal of this strip could reduce the size of some of the riparian areas in the lower American River that could serve as potential nesting areas for the cuckoo.

To compensate for this loss of riparian habitat, the Corps is proposing to plant up to 130 acres of riparian habitat along the lower American River. As described in the Conservation Measures, a variable sized soil filled planting bench will be constructed in the bank repair sites, where feasible. This will be used to offset some of the effects of loss of riparian vegetation. The launchable toe is also proposed for the bank protection and effects to on-site mitigation will occur as discussed in the Sacramento River effects section above. The remainder of the mitigation will occur along the lower American River. The American River Mitigation Site will have 8.63 acres removed as part of the restoration of the site. Overall, 11.29 acres of additional riparian habitat will be created on-site in a mosaic of riparian and scrub habitat that will provide greater diversity for the cuckoo.

Sacramento Weir – Due to the expansion of the weir and Sacramento Bypass, the Corps will remove 13.74 acres of valley oak riparian that is on the railroad alignment and to the east of the railroad alignment. This area will be converted to a concrete weir. While this patch, similar to riparian along the Sacramento River, does not serve as nesting habitat for the yellow-billed cuckoo because of its small size, it does provide migratory stopover habitat for the cuckoo. The Corps is proposing to compensate for the loss of this habitat either in the Lower American River, at the Beach Stone Lakes Conservation Area, or through the purchase of riparian floodplain credits at a mitigation bank.

In addition to the habitat loss for both the Sacramento and American Rivers, construction activities have the potential to adversely affect individual yellow-billed cuckoos. Construction that occurs when the cuckoo is in the Sacramento Valley has the potential to harass the bird due to noise. To minimize effects to the cuckoo due to construction noise, the Corps' conservation measure to do pre-construction bird surveys prior to beginning construction and to remove all vegetation outside of the migratory bird nesting season (March 1 to September 31), will enable the Corps to avoid nesting yellow-billed cuckoos. However, cuckoos that could be foraging in the area could be disturbed due to construction activities and noise and move to other locations in the lower American River parkway which could expose individual cuckoos to increased predation.

The conservation areas will provide both habitat for yellow-billed cuckoo and valley elderberry longhorn beetles. These areas will also ensure that there is a net increase of potential yellow-billed cuckoo nesting habitat along the lower American River Parkway. Recognizing that there is overlap in valley elderberry longhorn beetle habitat and yellow-billed cuckoo habitat and due to the different ratios proposed by the Corps, impacts due to the proposed project and mitigation sites will be developed and coordinated with the Service to ensure that habitat is created and balanced for both species. In total there will be up to 306 acres of habitat that will be heterogenous and provide habitat for the valley elderberry longhorn beetle, yellow-billed cuckoo, and salmonids. This acreage will be broken up in a combination of on-site, off-site, and conservation bank credits and will be coordinated with the Service.

The proposed conservation plan of the action will have the effect of protecting and managing lands for the species' conservation in perpetuity. The compensatory lands will provide suitable

habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. Providing this compensatory habitat in a way that provides relatively large, contiguous blocks of conserved land may contribute to recovery efforts for the yellow-billed cuckoo.

Operation and Maintenance - The Corps has proposed to evaluate effects to listed species including yellow-billed cuckoo when long-term maintenance activities for the Sacramento River and American River can be described. If maintenance activities will affect yellow-billed cuckoos the Corps will reinitiate consultation with the Service. Therefore, this biological opinion does not address effects to the yellow-billed cuckoo from any long-term levee maintenance activities.

Cumulative Effects

Cumulative effects include the effects of future non-Federal actions that are reasonably certain to occur in the action area considered in this biological opinion. 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 Act. During this consultation, the Service did not identify any future non-federal actions that are reasonably certain to occur in the action area of the proposed project.]

Conclusion

After reviewing the current status of the valley elderberry longhorn beetle, delta smelt, longfin smelt, giant garter snake, and yellow-billed cuckoo, the environmental baseline for the action area, the effects of the proposed American River Common Features 2016 project, and the cumulative effects, it is the Service's biological opinion that the American River Common Features 2016 project, as proposed, is not likely to jeopardize the continued existence of the valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, delta smelt, giant garter snake, and yellow-billed cuckoo. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following:

1) Conservation measures will be implemented that limit when work will occur to avoid when listed species are in the action area, or when they are less likely to be affected by the project;

2) The project will affect a small number of acres of habitat for each species in comparison to the total habitat in the range of these species;

3) Habitat will be created and preserved to offset effects to the vernal pool fairy shrimp and tadpole shrimp, valley elderberry longhorn beetle, delta smelt, and yellow-billed cuckoo. For most of these species there will be a net increase in habitat over what was affected; and

4) On-site creation of riparian habitat will maintain connectivity for all for aquatic and riparian species.

After reviewing the current status of designated critical habitat for the delta smelt, the environmental baseline for the action area, the effects of the proposed American River Common Features 2016 project, and the cumulative effects, it is the Service's biological opinion that the

American River Common Features 2016 project, as proposed, is not likely to destroy or adversely modify designated critical habitat. The Service reached this conclusion because the project-related effects to the designated critical habitat, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding the function of the delta smelt critical habitat to serve its intended conservation role for the species based on the following:

1) Habitat effected within critical habitat for delta smelt will be offset through the creation/preservation of 3 times that which is being affected within the critical habitat area and

2) Benches will be constructed on-site in the shallow water habitat zone will be created on-site and created in a way that allows for sediment to accrete and serve as potential delta smelt spawning habitat.

The effects to delta smelt critical habitat are small and discrete, relative to the entire area designated, and are not expected to appreciably diminish the value of the critical habitat or prevent it from sustaining its role in the conservation of the delta smelt.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without 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. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act if such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR §402.14(i)(3)).

Amount or Extent of Take

Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

The Service anticipates that incidental take of tadpole shrimp and fairy shrimp will be difficult to detect due to their life histories and ecologies. It is not possible to know how many vernal pool shrimp eggs are in the soil of any wetland features, or how many individuals or eggs will occupy any wetland feature later in time. The anticipated loss of individuals of these shrimp species also cannot be quantified due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their vernal pool habitats, or additional environmental disturbances. In instances where the total number of individuals to be taken cannot be determined, the Service may use the acreage of habitat impacted as a surrogate for the take of eggs/individuals. Therefore, the Service anticipates take incidental to the construction of the proposed project as the harm and mortality of all tadpole shrimp and fairy shrimp and eggs within the 0.56 acre of habitat that will be permanently lost by the proposed project.

Valley Elderberry Longhorn Beetle

The Service anticipates that incidental take of valley elderberry longhorn beetle will be difficult to detect due to its life history and ecology. Specifically, valley elderberry longhorn beetles can be difficult to locate since most of their life cycle is spent in the elderberry shrub and finding a dead or injured individual is unlikely due to their relatively small size. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities; therefore, the Service is authorizing take incidental to the proposed action as harm, harassment, injury, and mortality of all valley elderberry longhorn beetles within 35.44 acres of habitat and 44 isolated elderberry shrubs that will be transplanted as a result of construction.

Delta Smelt

The Service expects that incidental take of delta smelt will be difficult to detect or quantify for the following reasons: the small size of adults, their occurrence in turbid aquatic habitat makes them difficult to detect, and the low likelihood of finding dead or impaired specimens. The Service anticipates that the extent of incidental take will be minimized due to the proposed conservation measures and low relative abundance. Due to the difficulty in quantifying the number of delta smelt that will be taken as a result of the proposed action, the number of acres of affected habitat becomes a surrogate for the species that will be taken. The Service anticipates that all individual adult delta smelt in the 31.21acres of the action area may be subject to incidental take in the form of harm as described in this biological opinion. Incidental take of delta smelt for maintenance activities is not covered in this biological opinion.

Giant Garter Snake

The Service anticipates that incidental take of the snake will be difficult to detect or quantify for the following reasons: snakes are cryptically colored, secretive, and known to be sensitive to human activities. Snakes may avoid detection by retreating to burrows, soil crevices, vegetation, and other cover. Individual snakes are difficult to detect unless they are observed, undisturbed, at a distance. Most close-range observations represent chance encounters that are difficult to predict. It is not possible to make an accurate estimate of the number of snakes that will be harassed during construction activities, including in staging areas and roads carrying vehicular traffic. In instances when take is difficult to detect, the Service may estimate take in numbers of

species per acre of habitat lost or degraded as a result of the action as a surrogate measure for quantifying individuals. Therefore, the Service anticipates the number of giant garter snakes that may be found in 12.7 acres of aquatic and upland habitat will be harmed or killed as a result of habitat modification due to the proposed project. Incidental take of giant garter snake for maintenance activities is not covered in this biological opinion.

Yellow-Billed Cuckoo

The Service anticipates that incidental take of yellow-billed cuckoo will be difficult to detect due to its life history and ecology. Specifically, yellow-billed cuckoos can be difficult to locate due to their cryptic appearance and behavior and finding a dead or injured individual is unlikely. There is a risk of harm and harassment as a result of proposed construction activities and operations and maintenance of the restoration plantings; therefore, the Service is authorizing take incidental to the proposed action as harm and harassment of all yellow-billed cuckoos within 143.63 acres. Incidental take of yellow-billed cuckoo for maintenance activities is not covered in this biological opinion.

Upon implementation of the following reasonable and prudent measures, incidental take of vernal pool fairy shrimp and vernal pool tadpole shrimp, valley elderberry longhorn beetle, delta smelt, giant garter snake, and yellow-billed cuckoo associated with the American River Common Features 2016 will become exempt from the prohibitions described in section 9 of the Act. No other forms of take are exempted under this opinion.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, delta smelt, giant garter snake, and yellow-billed cuckoo resulting from implementation of this proposed project have been incorporated into the project's proposed conservation measures. Therefore, the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, delta smelt, giant garter snake, and yellow-billed cuckoo:

1) All conservation measures, as described in the biological assessment and restated here in the *Description of the Proposed Action* section of this biological opinion, shall be fully implemented and adhered to. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. The Corps shall include full implementation and adherence to the conservation measures as a condition of any permit or contract issued for the project.

2. To monitor whether the amount of incidental take anticipated from implementation of the proposed project is approached, the Corps will adhere to the following reporting requirement.

    a. For those components of the action that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated, the Corps shall provide a letter prior to construction of the actual impacts and mitigation as well as a precise accounting of the total acreage of habitat impacted per contract to the Service at the completion of the construction season.

    b. The Corps shall immediately contact the Service's Sacramento Fish and Wildlife Office (SFWO) at (916) 414-6541 to report direct encounters between listed species and project workers and their equipment whereby incidental take in the form of, harm, injury, or death occurs. If the encounter occurs after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day. When injured or killed individuals of the listed species are found, the Corps shall follow the steps outlined in the Salvage and Disposition of Individuals section below.

Salvage and Disposition of Individuals:

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact person is the Military and Waterway Planning Division, Division Supervisor at the Sacramento Fish and Wildlife Office at (916) 414-6541.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

1) The Service recommends the Corps develop and implement restoration measures in areas designated in the Delta Fishes Recovery Plan (Service 1996) the Giant Garter Snake Recovery Plan (2017) and the Valley Elderberry Longhorn Beetle Recovery Plan (2019).

2) The Corps and SAFCA should develop and implement projects that support DWR's Central Valley Flood System Conservation Strategy. This document provides goals and measurable objectives and potential projects which could be implemented in a manner that while improving the riverine ecosystem also will improve the flood system.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the American River Common Features 2016 project. As provided in 50 CFR §402.16(a), reinitiation of consultation is required and shall be requested by the federal agency where discretionary federal 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 action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or

4) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Jennifer Hobbs (Jennifer_hobbs@fws.gov), at the letterhead address or at (916) 414-6541.

Sincerely,

MICHAEL FRIS

Digitally signed by MICHAEL FRIS
Date: 2025.03.21 11:52:56 -07'00'

Michael Fris
Field Supervisor

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