

APPENDIX C - BIOLOGICAL RESOURCES

- C-1 Aquatic Resources Delineation, Stockton East Water District "Bellota Weir Modifications Project" San Joaquin County, California (Moore Biological Consultants. 2022a)
- C-2 Biological Assessment, Stockton East Water District "Bellota Weir Modifications Project" San Joaquin County, California (Moore Biological Consultants. 2022b.)
- C-3 Biological Assessment of Potential Impacts of the Bellota Weir Modification Project on Fisheries Resources (FISHBIO. June 2022.)

Aquatic Resources Delineation

Stockton East Water District “Bellota Weir Modifications Project”

San Joaquin County, California

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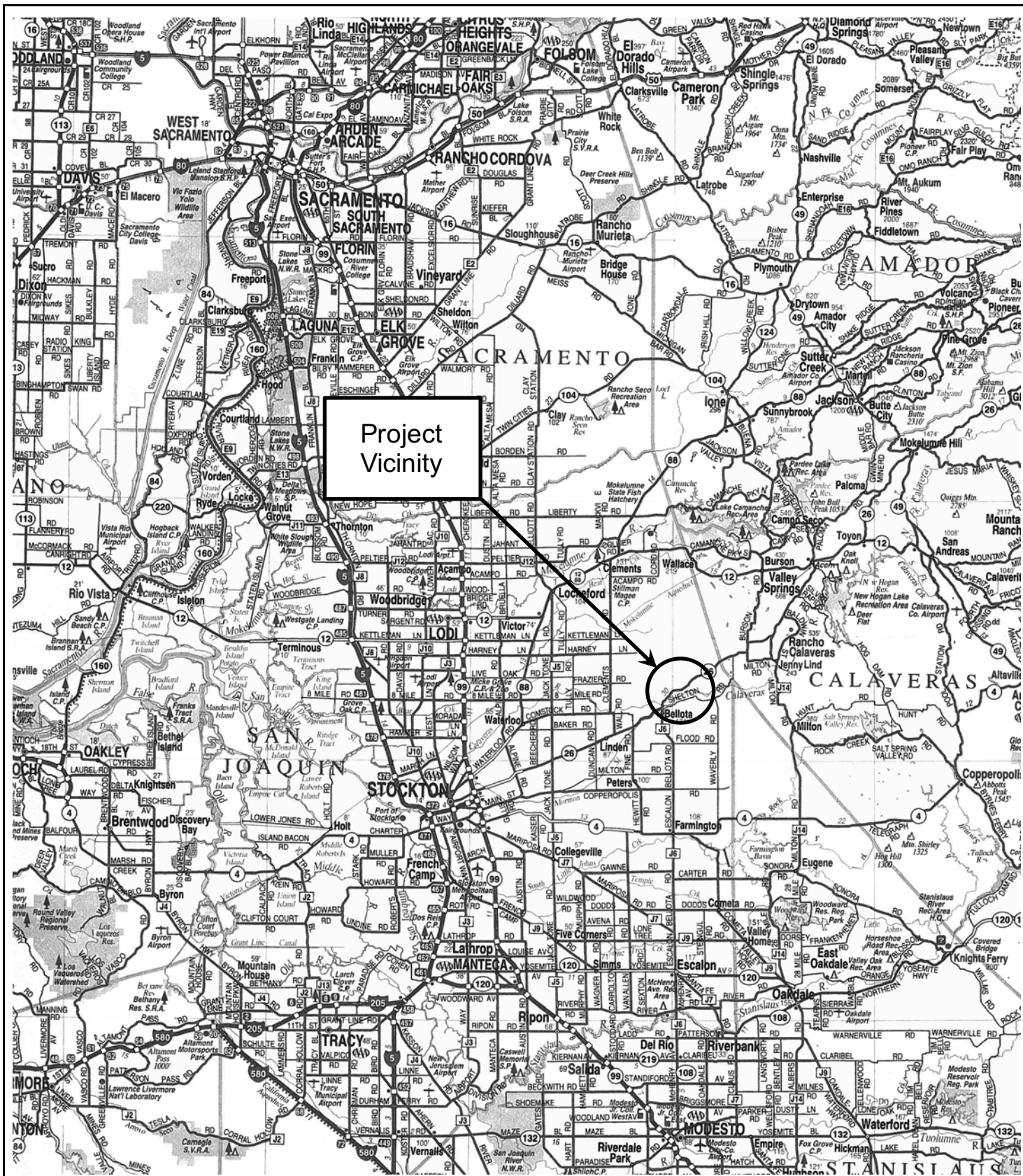
I. INTRODUCTION

The 15.49+/-acre “Bellota Weir Modifications Project” site is in the vicinity of the historic town of Bellota, in eastern San Joaquin County, California (Figure 1). The site is in Section 5, in Township 2 North, Range 9 East of the Linden topographic quadrangle (Figure 2). The site slopes down gently to the west and is at elevations of approximately 100 to 150 feet above mean sea level. The project site is at Stockton East Water District’s (SEWD) Bellota irrigation diversion facility at the divergence of the Calaveras River, in a predominantly agricultural area.

The site is best accessed by taking Highway 99 south from Sacramento approximately 42 miles to the E Fremont Street/Highway 26 (254B) exit in Stockton. Turn left (heading east) on Highway 26 and continue approximately 14 miles to the town of Bellota. Approximately 1,000 feet past the intersection of Escalon-Bellota Road and Highway 26, turn right (south) through the gate in to the irrigation diversion facility. Any visitors will need to coordinate with facility workers in advance of a field visit due to locked gates.

The site is comprised of a mosaic of grassland areas, patches of trees, previously developed areas, and aquatic habitats. Vegetation communities in the project site include annual ruderal grassland, valley oak woodland, and riparian woodland. Riverine habitats within the work area includes the Old Calaveras River, and Mormon Slough. The mainstem of the Calaveras River is located just upstream of the work area, but adjacent banks of the Calaveras River are within the work area.

Surrounding land uses in this portion of San Joaquin County are primarily agricultural, with widely scattered residences consisting primarily of ranchette-style homes. Highway 26 is located to the west of the site and East Shelton Road is situated to the southeast. Most of the parcels in the greater project vicinity are



Source: California State
Automobile Association

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Consultants**



0 9 18 Miles

FIGURE 1

PROJECT VICINITY

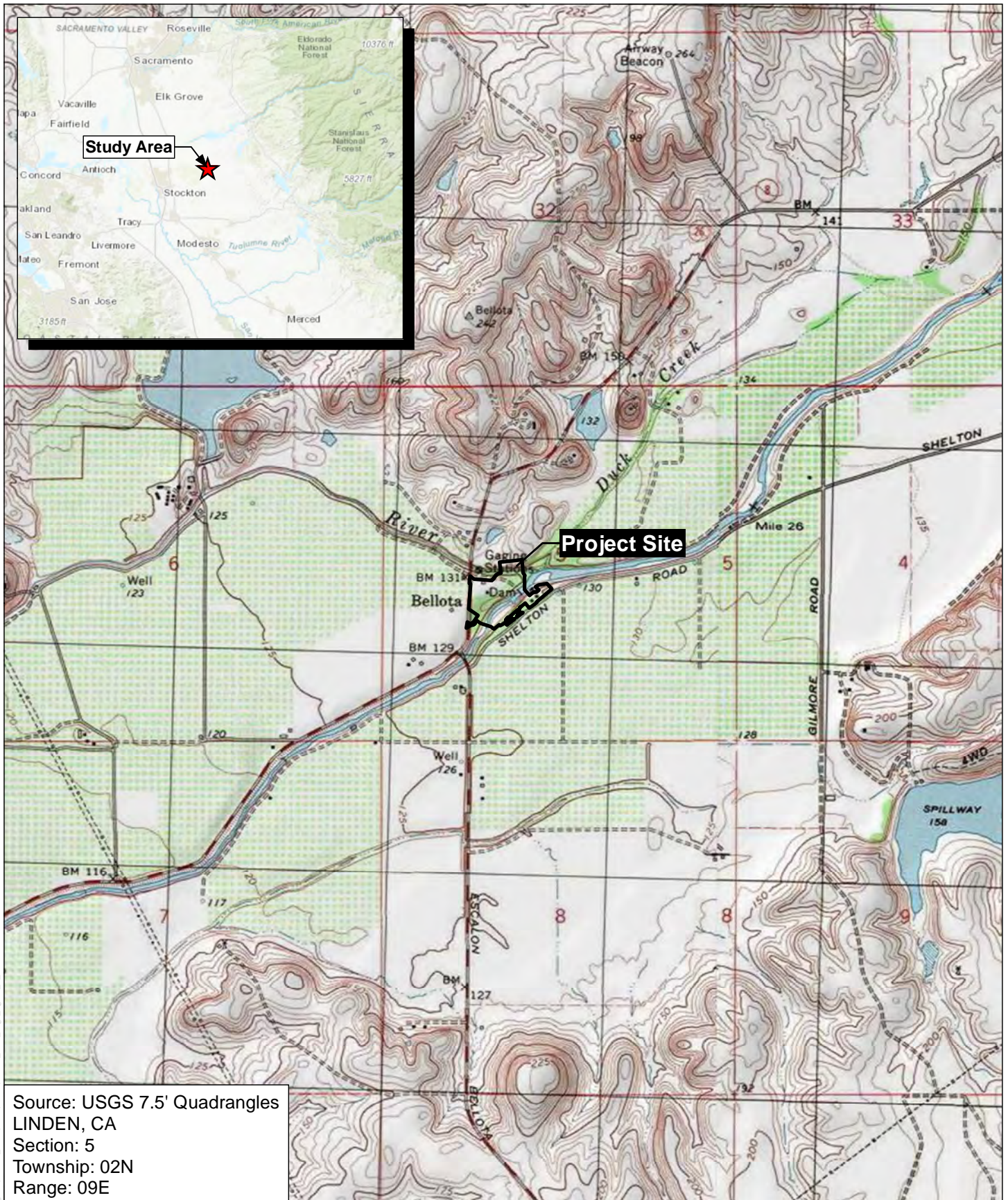
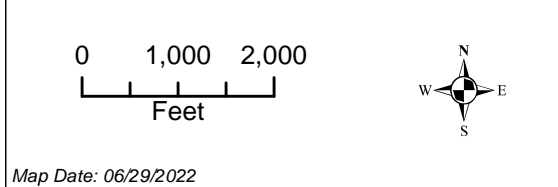


Figure 2

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USGS

Bellota Weir Modifications Project

San Joaquin County, CA

farmed in orchard crops. There are also lesser acreages of vineyards and annual crops, and open grassland used primarily for livestock grazing.

The aquatic resources delineation was conducted in support of modifications of the existing Bellota Weir to benefit fish populations, primarily out-migrating Central Valley steelhead (*Oncorhynchus mykiss*) and Chinook salmon (*Oncorhynchus tshawytscha*). The delineation documents the locations, types, and the approximate extent of potentially jurisdictional Waters of the U.S. in the project site.

II. METHODS

Waters of the U.S.

“Waters of the U.S.”, as defined in 33 CFR 328.4, encompasses Territorial Seas, Tidal Waters, and Non-Tidal Waters; Non-Tidal Waters includes many interstate and intrastate rivers and streams, as well as a number of intermittent streams and their tributaries. The limit of federal jurisdiction of Non-Tidal Waters of the U.S. generally extends to the “ordinary high water mark” (OHWM). The OHWM is established by physical characteristics such as a natural water line impressed on the bank, presence of shelves, destruction of terrestrial vegetation, or the presence of litter and debris.

The limit of federal jurisdiction of Waters of the U.S. (i.e., OHWM) along the banks of the aquatic features in the site was identified by physical characteristics described above.

Wetlands

Wetlands are a subset of Waters of the U.S. The ACOE Wetlands Delineation Manual (1987) and 2008 Regional Supplement require the presence of three

criteria for delineating wetlands: 1) hydrophytic vegetation; 2) hydric soils; and 3) wetland hydrology. Wetland delineation incorporates analysis of vegetation to identify wetlands species and their wetlands indicator status, soil sampling to identify hydric soils, and an evaluation of the site's hydrology. Generally, all three criteria must be met for an area to be delineated as a wetland.

VEGETATION: Hydrophytic vegetation is defined as vegetation adapted to growth in water or on a substrate that is at least periodically deficient in oxygen as a result of saturation. The ACOE manual assigns wetland plant species to four categories based on frequency of occurrence in wetlands: 1) obligate wetlands species that occur in wetlands 99 percent of the time; 2) facultative wetlands plants that occur in wetlands 67 to 99 percent of the time; 3) facultative plants that are equally likely to occur in wetlands or uplands; and 4) facultative upland plants that occur in uplands 67 to 99 percent of the time. If 50 percent or greater of the dominant plant species are rated as obligate, facultative, or facultative wetland species, the area is considered to have wetland vegetation.

Field determinations for the presence of hydrophytic vegetation were conducted by visually assessing plant community composition. Plants were identified and categorized into one of the four classifications of hydrophytic vegetation.

Wetland indicator status of each species was determined using the *National Wetland Plant List: Arid West 2020 Regional Wetland Plant List* (ACOE, 2020).

SOILS: Hydric soil is a soil that is saturated, flooded, or inundated for long enough to develop conditions that favor the growth of hydrophytic plants. Soil color reflects the presence of water in the soil and is the primary factor used to determine whether or not a soil is hydric. The Munsell Soil Chart (Munsell, 1988), which classifies soils according to three criteria: 1) color; 2) lightness or darkness of the color; and 3) chroma, which is the purity or saturation of the color, is used to visually determine soil color. Hydric soils usually have a low chroma value and often contain redoximorphic features such as redox

concentrations (mottles, oxidized rhizospheres), and redox depletions that are areas of different color interspersed within the dominant matrix color of the soil.

Soil samples were not warranted during the aquatic resources delineation as aquatic areas in the site are restricted to the Old Calaveras River and Mormon Slough, both of which have an obvious OHWM. No areas supporting wetland vegetation, and therefore requiring soil evaluation, were observed on the banks of the rivers above the OHWMs or elsewhere in the site.

HYDROLOGY: A wetland requires inundation or soil saturation for a significant period (i.e., a minimum of about 2 weeks) during the growing season. For example, wetlands can be found both along streams and rivers where flooding is likely to occur and also in low, depressed areas where groundwater discharges to the surface or where an impervious layer lays close to the surface thereby creating a perched water table (e.g., seasonal wetlands and vernal pools).

Hydrology field indicators were visually assessed within the survey area. Hydrologic indicators searched for included artificial and natural drainages, topographic basins, evidence of inundation, saturated soils, algal matting, surface soil cracks, and oxidized rhizospheres among living roots.

Field Mapping

The aquatic resources delineation was conducted in accordance with the 1987 Corps of Engineers Wetland Delineation Manual and 2008 Regional Supplement. Potentially jurisdictional Waters of the U.S., including wetlands in the site were delineated in the field on January 6, 2021 and July 7, 2022. Diane S. Moore, M.S. and Colleen Laskowski, M.S. conducted the aquatic resources delineation.

The boundaries of the aquatic habitats were mapped using a Trimble GeoXT Global Positioning System (GPS) unit. The GPS data was corrected using the nearest available base station and combined with a 2020 Google Earth color

aerial photograph in ArcGIS to create an aquatic resources delineation and table of acreages (Appendix A). The acreage of Waters of the U.S. was calculated as the area below the OHWM.

III. RESULTS

Environmental Setting

The 15.49+/- acre project site is in the vicinity of the historic town of Bellota in eastern San Joaquin County, California. The site is in Section 5, in Township 2 North, Range 9 East of the Linden topographic quadrangle (Figure 2). The site slopes down gently to the west and is at elevations of approximately 100 to 150 feet above mean sea level.

VEGETATION: The site is comprised of a mosaic of grassland areas, patches of trees, previously developed areas, and aquatic habitats. Vegetation communities in the project site include annual ruderal grassland, valley oak woodland, riparian woodland, a few developed areas, and a strip of land along the edge of an orchard. Riverine habitats include the Old Calaveras River and Mormon Slough.

Operation and maintenance at the on-site diversion facility, periodic mowing and/or disking of grasslands, as well as development and farming activities on surrounding parcels, has substantially modified vegetation in the site. The grasslands in the site are ruderal and moderately to highly disturbed. Wild oats (*Avena* sp.), soft chess brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), foxtail (*Hordeum murinum*), and perennial ryegrass (*Lolium perenne*) are dominant grass species. Other grassland species such as black mustard (*Brassica nigra*), yellow star-thistle (*Centaurea solstitialis*), field bindweed (*Convolvulus arvensis*), wild radish (*Raphanus sativa*), prickly lettuce (*Lactuca serriola*), Italian thistle (*Carduus pycnocephalus*), rose clover (*Trifolium hirtum*), vetch (*Vicia villosa*), and filaree (*Erodium* sp.) are intermixed with the grasses.

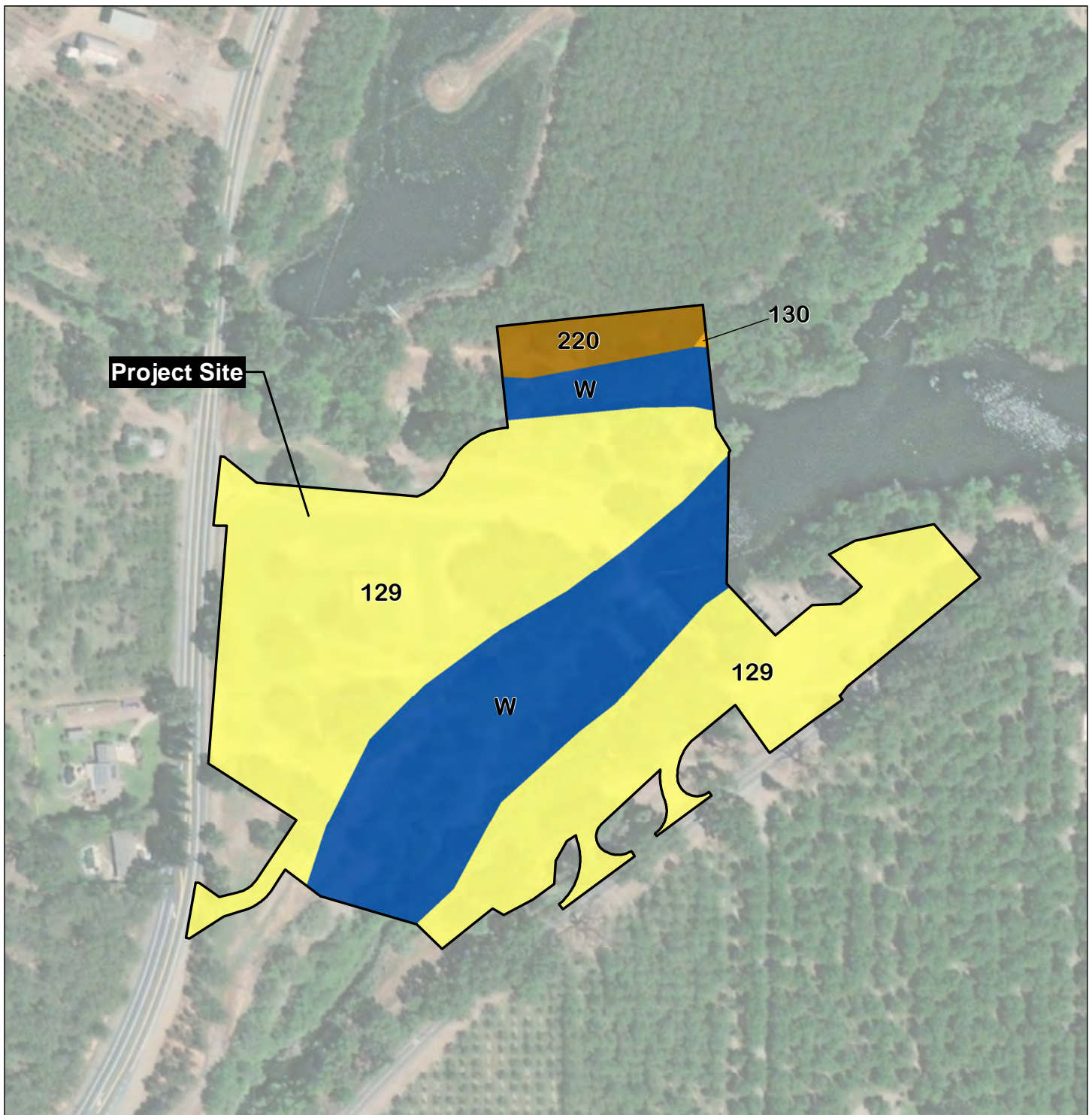
Table 1 is a list of vegetation found within the site also includes the wetland indicator status of each species (Appendix B).

Trees in the site are primarily located in the riparian woodland and oak woodland vegetation. Dominant trees in the riparian woodland vegetation include box elder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), Goodding's black willow (*Salix gooddingii*), narrow-leaved willow (*Salix exigua*), and black walnut (*Juglans californica*). The oak woodlands are situated further from the river corridor, separated by the fringe of riparian vegetation. The oak woodlands are dominated by valley oaks (*Quercus lobata*), but also contain a few planted ornamental varieties including cork oak (*Quercus suber*), magnolia (*Magnolia grandiflora*), deodar cedar (*Cedrus deodara*), and sweetgum (*Liquidamber styraciflua*).

Shrubs and vines in the site include California wild rose (*Rosa californica*), Himalayan blackberry (*Rubus armeniacus*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), poison oak (*Toxicodendron diversilobum*), California wild grape (*Vitis californica*), and giant reed (*Arundo donax*).

The riverine habitats, at and near the waterline, support a generally narrow and discontinuous fringe of willow seedlings, tall flat sedge (*Cyperus eragrostis*), pennyroyal (*Mentha pulegium*), curly dock (*Rumex crispus*), annual rabbit's-foot grass (*Polypogon monspeliensis*), and other common hydrophytes.

SOILS: The U.S. Department of Agriculture 1992 Soil Survey for San Joaquin County, California (USDA SCS, 1992) was utilized to gain an understanding of the on-site soil types. The three soil types within the project site are Cogna loam, 0 to 2 percent slopes (Map Unit 129), Columbia fine sandy loam, drained, 0 to 2 percent slopes, MLRA 17 (Map Unit 130), and Redding gravelly loam, 0 to 8 percent slopes, dry (Map Unit 220) (Figure 3). Cogna loam, 0 to 2 percent slopes (Map Unit 129) and Redding gravelly loam, 0 to 8 percent slopes, dry (Map Unit 220) are described as "well drained" and "moderately well drained", respectively. Neither of these soils are classified as a "hydric soil", but both contain inclusions



Soils on the Project Site:
 129 - Cogna loam, 0 to 2 percent slopes
 130 - Columbia fine sandy loam, drained, 0 to 2 percent slopes, MLRA 17
 220 - Redding gravelly loam, 0 to 8 percent slopes, dry
 W - Water

Figure 3

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0 150 300



SOILS

Bellota Weir Modifications Project

San Joaquin County, CA

of hydric soils. The small portion of Columbia fine sandy loam, drained, 0 to 2 percent slopes, MLRA 17 (Map Unit 130) is described as “somewhat poorly drained” and is classified as a hydric soil (USDA NRCS, 2012).

Potential Waters of the U.S.

A total of 2.387 acres of other waters was delineated in the site and include a section of the Old Calaveras River and a section of Mormon Slough (Appendix A). Photographs of the other waters and representative uplands in the site are included in Appendix C. The National Wetland Inventory Map of the area is included in Appendix D.

OTHER WATERS (MORMON SLOUGH): Approximately 2.050+/- acres of Mormon Slough flows through the center of the site and is labeled “Other Waters OW-1” on the aquatic resources delineation map (Appendix A and photographs in Appendix C). Mormon Slough branches off from the Calaveras River just east (upstream) of the project site, and flows generally east to west through the site.

The potential jurisdictional limit of Mormon Slough is defined by its OHWM. This section of Mormon Slough is approximately 90 feet wide from OHWM to OHWM and has relatively steep banks. The portion of Mormon Slough consists of a broad alluvial channel with a mixture of low gradient run and pool habitats with gravel, cobble, and clay substrates. Trees along the bank include Oregon ash, willows, and box elder. Wild rose, blackberries, and other emergent wetland vegetation occurs at and below the OHWM. Mormon Slough is depicted as a “blue-line” drainage on the USGS topographic map (Figure 2) and the National Wetland Inventory (NWI) map depicts this channel as a “Riverine” feature (Appendix D).

OTHER WATERS (OLD CALAVERAS RIVER): Approximately 0.34+/- acres of the Old Calaveras River is situated at the north part of the site and is labeled “Other Water OW-2” on the aquatic resources delineation map (Appendix A and

photographs in Appendix C). The Old Calaveras River branches off from the Calaveras River just east (upstream) of the project site, and flows generally east to west through the site.

The potential jurisdictional limit of the Old Calaveras River is defined by its OHWM. The Old Calaveras River is approximately 40 feet wide from OHWM to OHWM and has very steep banks. The portion of the river channel is heavily shaded, primarily by valley oaks, with lesser amounts of willows, box elder, and Oregon ash. Blackberry brambles, tall flat sedge, annual rabbit's foot grass, and other hydrophytes are situated at and below the OHWM. The Old Calaveras River is much smaller in comparison to Mormon Slough. The Old Calaveras River is depicted as a "blue-line" drainage on the USGS topographic map (Figure 2) and the NWI map depicts this channel as a "Riverine" feature (Appendix D).

HYDROLOGIC PATTERNS AND JURISDICTIONAL BASIS: Both the Old Calaveras River and Mormon Slough branch off from the mainstem of the Calaveras River, a navigable Water of the U.S., just upstream of the work area. Each of these channels also eventually drain in to the San Joaquin River, also a navigable Water of the U.S, many miles west of the project site.

Potential Wetlands

There are no wetlands in or adjacent to the project site. The remainder of the site is vegetated in ruderal upland grassland vegetation, with soils that appear well draining. No areas were observed in the site with 50 percent or greater of the dominant plant species are rated as obligate, facultative, or facultative wetland species. No artificial or natural drainages or topographic basins were observed in the site. Further, no areas with evidence of inundation, saturated soils, algal matting, or surface soil cracks were observed in the site.

IV. CONCLUSIONS

- A total of 2.387 acres of aquatic resources was delineated in the site, including 2.050 acres of Mormon Slough (“OW-1”) and 0.337 acres of the Old Calaveras River (“OW-2”).
- The Old Calaveras River and Mormon Slough are potentially jurisdictional Waters of the U.S. due to their tributary relationship with the San Joaquin River downstream of the site.
- There are no wetlands in or adjacent to the project site.

V. REFERENCES

ACOE (U.S. Army Corps of Engineers). 1987. Technical Report Y87-1. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MI.

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USDA SCS (Soil Conservation Service). 1992. Soil Survey of San Joaquin County, California. October.

USDA NRCS. 2012. National Hydric Soils List by State.
<http://soils.usda.gov/use/hydric>. April.

Appendix A

Aquatic Resources Map



 Study Area (15.49 acres)

Data Disclaimer:

The delineation has been done in accordance with the 1987 Wetlands Delineation Manual, US Army Corps of Engineers and the 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. The boundaries and jurisdictional status of all waters shown on this map are preliminary and subject to verification by the U.S. Army Corps of Engineers.

AQUATIC RESOURCES

| Feature | Label | Area | |
|---|----------------------------|----------------|--------------|
| | | (sf) | (acre) |
|  | OW-1 (Mormon Slough) | 89,304 | 2.050 |
| | OW-2 (Old Calaveras River) | 14,687 | 0.337 |
| | Total | 103,991 | 2.387 |

Potential Waters of the U.S. and Wetlands

Bellota Weir Modifications Project

San Joaquin County, CA

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0 100 200
Feet



Map Date: 07/06/2022
Aerial Source: Google Earth (09/2020)

Appendix B

Plant List

Table 1
Plant List

| Scientific Name | Common Name | Indicator Status ¹ |
|--------------------------------|----------------------------|-------------------------------|
| <i>Acer negundo</i> | box elder | FACW |
| <i>Acmispon americanus</i> | American deerweed | UPL |
| <i>Ailanthus altissima</i> | tree of heaven | FACU |
| <i>Amsinckia menziesii</i> | rancher's fireweed | NL |
| <i>Arundo donax</i> | giant reed | FACW |
| <i>Avena fatua</i> | oat | NL |
| <i>Brassica nigra</i> | black mustard | NL |
| <i>Bromus diandrus</i> | ripgut brome | NL |
| <i>Bromus hordeaceus</i> | soft chess brome | FACU |
| <i>Bromus madritensis</i> | compact brome | UPL |
| <i>Capsella bursa-pastoris</i> | shepherd's purse | FACU |
| <i>Carduus pycnocephalus</i> | Italian thistle | NL |
| <i>Cedrus deodara</i> | deodar cedar | NL |
| <i>Centaurea solstitialis</i> | yellow star thistle | NL |
| <i>Cerastium glomeratum</i> | sticky mouse-ear chickweed | UPL |
| <i>Chamomilla suaveolens</i> | pineapple weed | NL |
| <i>Cirsium vulgare</i> | bull thistle | FACU |
| <i>Claytonia perfoliate</i> | miner's lettuce | FAC |
| <i>Conium maculatum</i> | poison hemlock | FACW |
| <i>Convolvulus arvensis</i> | field bindweed | NL |
| <i>Cynodon dactylon</i> | Bermuda grass | FACU |
| <i>Cyperus eragrostis</i> | tall flat sedge | FACW |
| <i>Datura stramonium</i> | Jimsonweed | NL |
| <i>Dittrichia gravelons</i> | stinkwort | NL |
| <i>Epilobium brachycarpum</i> | annual fireweed | NL |
| <i>Eremocarpus setigerus</i> | turkey mullein | NL |

Table 1 (continued)

Plant List

| Scientific Name | Common Name | Indicator Status ¹ |
|--------------------------------|----------------------------|-------------------------------|
| <i>Erigeron canadensis</i> | Canadian horseweed | FACU |
| <i>Erodium botrys</i> | long-beaked filaree | FACU |
| <i>Fraxinus latifolia</i> | Oregon ash | FACW |
| <i>Galium aparine</i> | sticky willy | FACU |
| <i>Geranium dissectum</i> | cut leaf geranium | NL |
| <i>Geranium mole</i> | dove's foot crane's bill | NL |
| <i>Helenium puberulum</i> | rosilla | FACW |
| <i>Holcus lanatus</i> | common velvetgrass | FAC |
| <i>Hordeum murinum</i> | wall barley | FACU |
| <i>Juglans californica</i> | black walnut | FACU |
| <i>Lactuca serriola</i> | prickly lettuce | FACU |
| <i>Lamium amplexicaule</i> | clasping henbit | NL |
| <i>Liquidambar styraciflua</i> | sweet gum | FAC |
| <i>Lolium perenne</i> | perennial ryegrass | FAC |
| <i>Magnolia grandiflora</i> | magnolia | NL |
| <i>Malva neglecta</i> | common mallow | NL |
| <i>Marah fabaceus</i> | California manroot | NL |
| <i>Melilotus alba</i> | white sweet clover | NL |
| <i>Mentha pulegium</i> | pennyroyal | OBL |
| <i>Paspalum dilatatum</i> | golden crown grass | FAC |
| <i>Phytolacca americana</i> | pokeweed | FAC |
| <i>Poa annua</i> | annual blue grass | FAC |
| <i>Polygonum aviculare</i> | prostrate knotweed | FAC |
| <i>Polypogon monspeliensis</i> | annual rabbit's foot grass | FACW |
| <i>Quercus lobata</i> | valley oak | FACU |

Table 1 (continued)

Plant List

| Scientific Name | Common Name | Indicator Status ¹ |
|-------------------------------------|------------------------|-------------------------------|
| <i>Quercus suber</i> | cork oak | NL |
| <i>Raphanus sativus</i> | wild radish | NL |
| <i>Rubus armeniacus</i> | Himalayan blackberry | FAC |
| <i>Rumex crispus</i> | curly dock | FAC |
| <i>Salix exigua</i> | narrowleaf willow | FACW |
| <i>Salix goodingii</i> | Gooding's black willow | FACW |
| <i>Sambucus nigra ssp. caerulea</i> | blue elderberry | NL |
| <i>Senecio vulgaris</i> | common groundsel | FACU |
| <i>Silybum marianum</i> | milk thistle | NL |
| <i>Sonchus oleraceus</i> | common sow-thistle | UPL |
| <i>Sorghum halepense</i> | Johnsongrass | FACU |
| <i>Tribulus terrestris</i> | puncture vine | NL |
| <i>Trifolium hirtum</i> | rose clover | NL |
| <i>Triteleia laxa</i> | Ithuriel's spear | NL |
| <i>Urtica dioica</i> | stinging nettle | FAC |
| <i>Verbena lasiostachys</i> | western vervain | FAC |
| <i>Vicia villosa</i> | hairy vetch | FACU |
| <i>Vitis californica</i> | California grape | FACU |

¹ OBL = obligate wetlands species that occur in wetlands 99 percent of the time; FACW = facultative wetlands plants that occur in wetlands 67 to 99 percent of the time; FAC = facultative plants that are equally likely to occur in wetlands or uplands; FACU = facultative upland plants that occur in uplands 67 to 99 percent of the time; NI = species with no indicator status due to insufficient information; UPL = occurs in uplands 99% percent of the time; NL = upland species not included in the *National Wetland Plant List: Arid West 2020 Final Regional Plant List* (ACOE, 2020).

Appendix C

Photographs



Mormon Slough, looking southwest along the north bank of the river; 07/02/21. The banks of Mormon Slough are steep and the limit of Corps of Engineers jurisdiction is the ordinary high water mark.



Bellota weir, looking west from the south bank of Mormon Slough; 03/20/20.



Old Calaveras River, looking east from a control structure just west of the project site; 07/02/21. The banks of the Old Calaveras River are steep and the limit of Corps of Engineers jurisdiction is the ordinary high water mark.



Mormon Slough, looking upstream toward the Bellota weir; 01/06/22.



Upland grassland north of Mormon Slough, looking east; 01/06/22.



Ruderal grassland south of Mormon Slough, looking southwest; 03/20/20. This area will be used for construction staging.

Appendix D

National Wetland Inventory Map



U.S. Fish and Wildlife Service

National Wetlands Inventory

Bellota Weir Modifications Project



July 6, 2022

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Biological Assessment

Stockton East Water District “Bellota Weir Modifications Project”

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I. INTRODUCTION

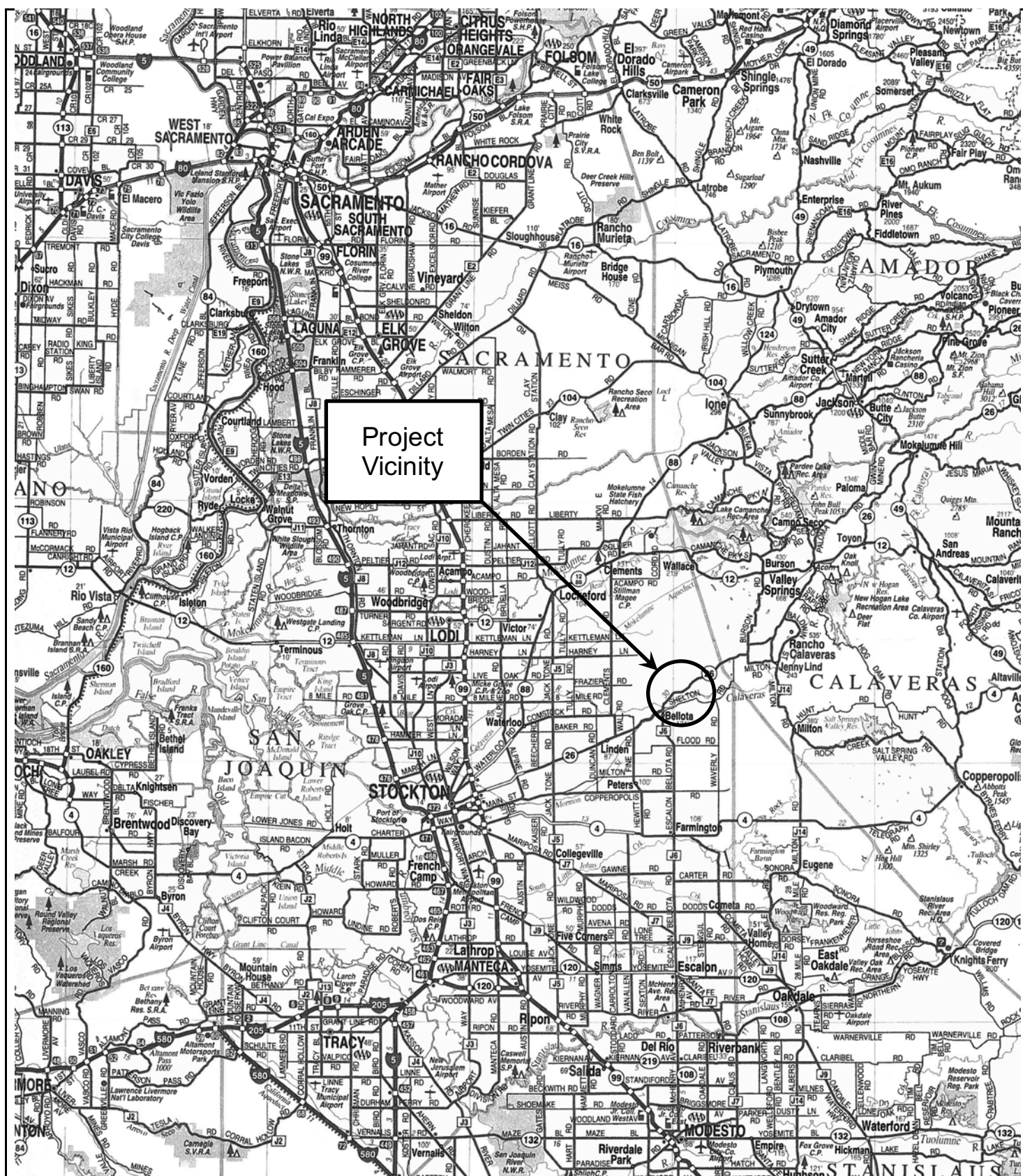
The project site is in the vicinity of the historic town of Bellota, in eastern San Joaquin County, California (Figure 1). The site is in Section 5, in Township 2 North, Range 9 East of the Linden topographic quadrangle (Figure 2). The site slopes down gently to the west and is at elevations of approximately 100 to 150 feet above mean sea level. The project site is at Stockton East Water District's (SEWD) Bellota irrigation diversion facility at the divergence of the Calaveras River, in a predominantly agricultural area.

The proposed project is substantial modifications to the Bellota irrigation diversion facility. The project involves removal of the existing weir, channel modifications to improve fish passage, and other facilities improvements.

Upland areas in the site provide habitat for a number of common wildlife species and a few special-status species. Swainson's hawk (*Buteo swainsoni*), tricolored blackbird (*Agelaius tricolor*), and western pond turtle (*Emys marmorata*) are special-status wildlife species that may occur in the project site. Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) could potentially occupy blue elderberry shrubs in the site.

This biological assessment (BA) describes the existing terrestrial biological environment and how the project would affect that environment. The BA also recommends appropriate avoidance, minimization, and mitigation measures for those effects. The potential for occurrence and potential project impacts to special-status fish are addressed in a separate Biological Assessment (Fishbio, 2022).

With the implementation of the recommended mitigation measures, including pre-construction surveys, construction scheduling, and take avoidance measures, the project would have less than significant impacts to terrestrial plant and wildlife species. The project will provide substantial benefits to fisheries resources and



Source: California State
Automobile Association

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0 9 18
Miles

FIGURE 1

PROJECT VICINITY

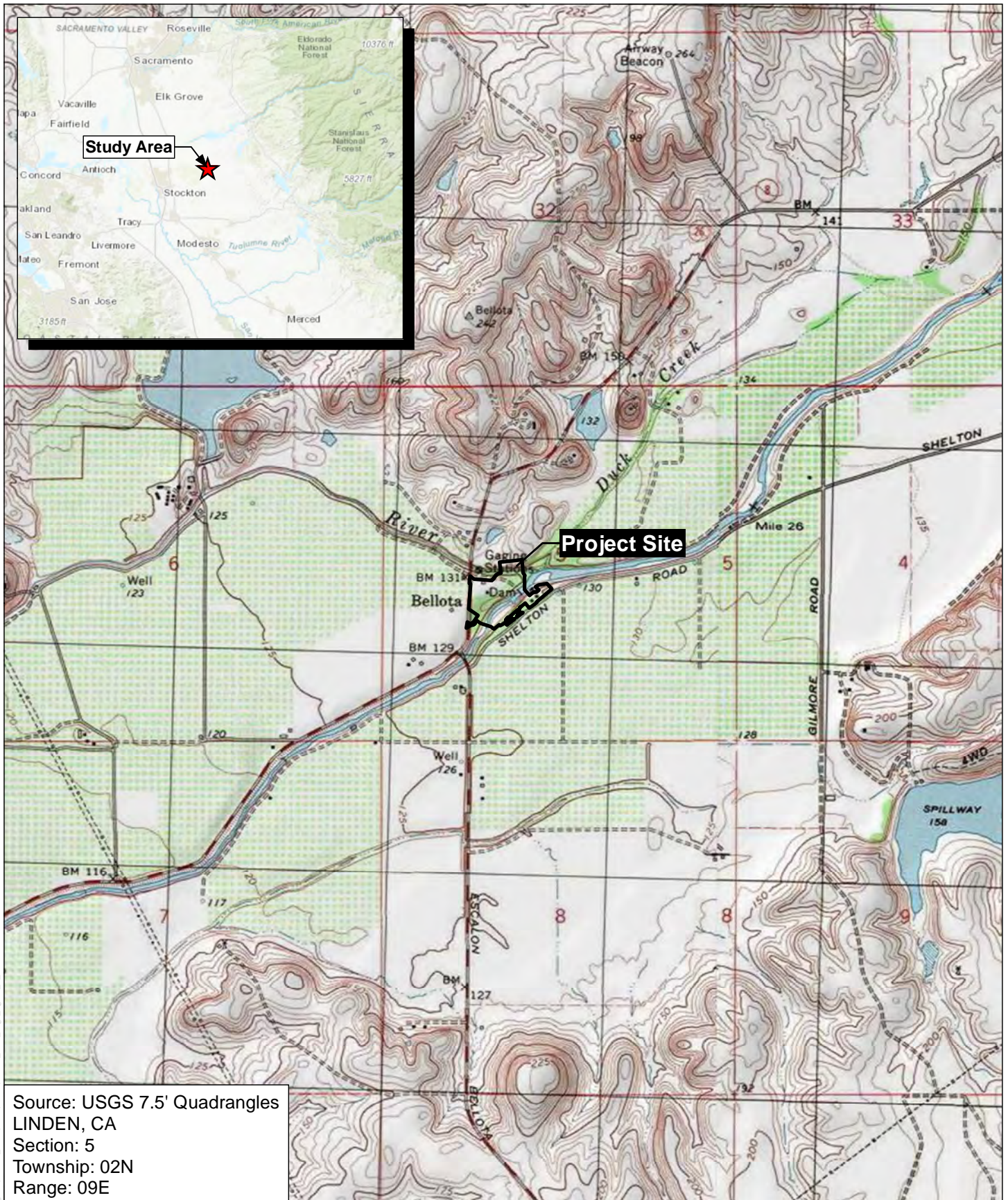


Figure 2

Moore Biological
Consultants

0 1,000 2,000
Feet

Map Date: 06/29/2022



USGS

Bellota Weir Modifications Project

San Joaquin County, CA

there will be no long-term adverse impacts to terrestrial biological resources as a result of the proposed project.

II. PROJECT DESCRIPTION

The proposed project is modifications to at Stockton East Water District's Bellota irrigation diversion, located at the divergence of the Calaveras River. The proposed modifications to the facilities will provide protection for out-migrating Central Valley steelhead (*Oncorhynchus mykiss*) and will allow for improved adult steelhead access to spawning and rearing habitats in the Calaveras River upstream of the project site. The project will provide similar benefits to Chinook salmon (*Oncorhynchus tshawytscha*) that may opportunistically utilize the Calaveras River.

The three primary project objectives are to:

- Improve fish passage by designing and constructing a new crest gate dam, fishway, and fish screens that includes passage for Central Valley steelhead and opportunistic migration for Chinook salmon;
- Reduce fish entrainment by constructing a new non-entraining fish barrier at the Old Calaveras River and new surface water intake with fish screens; and,
- Provide more reliable water delivery through weir and intake improvements.

The proposed Project facility combines several operational and engineered elements to achieve its intended objectives: intake and weir replacement and improvements for effective fish passage, reduced fish entrainment, and water supply reliability. The proposed project components are depicted on the Site Plan in Appendix A and include the following:

- Remove the existing Bellota Weir and construct a concrete dam with a series of weir gates designed to modulate forebay pool elevations based on operational needs.
- Improve sediment conveyance by including sluicing functions in the forebay, intake manifold, and screen channel.
- Provide reliable fish passage using a roughened channel combined with a fishway utilizing both vertical slot, pool, and weir techniques to accommodate the full range of flows and river stages at the site.
- Provide reliable fish screening, both for the Bellota Intake and the Old Calaveras River, to prevent fish entrainment.
- Provide a non-entraining fish barrier to the Old Calaveras River using an earthen embankment.

Construction of the project will involve removal of trees and shrubs, demolition of a building, grading, and other activities in approximately 9.52 acres of the 15.5+/- acre site (see Environmental Impact Exhibit in Appendix A). Additionally, approximately 4.96 acres will be used for construction staging, including 3.69+/- acres and 1.27+/- acres on the north and south sides of Mormon Slough, respectively. The trees in the staging areas are relatively large, with high canopies and ample room for equipment and personnel. While trimming of some low tree branches in the staging areas may be needed, the trees will not be removed. Following construction, vegetation and wildlife habitats in the staging areas will be comparable to those prior to construction.

Removal of the existing Bellota Weir, in combination with the above components, would provide more reliable water delivery while improving passage of both juvenile and adult fish, and reduce fish entrainment at the facilities. As there are several other improvements planned as part of the proposed project, further descriptions of each individual component are provided in greater detail in ECORP 2022.

III. METHODS

Database Review

The United States Fish and Wildlife Service (USFWS) IPaC Trust Report of Federally Threatened and Endangered species that may occur in or be affected by projects in the project vicinity was reviewed (Appendix B). A search of CDFW's California Natural Diversity Database (CNDDDB, 2022) was also conducted. The CNDDDB search included the USGS 7.5-minute Clements, Wallace, Linden, Valley Springs SW, Peters, and Farmington topographic quadrangles, encompassing approximately 360 square miles around the project site. This information was used to identify wildlife and plant species that have been previously documented in the project vicinity or have the potential to occur based on suitable habitat and geographical distribution. The USFWS on-line maps of designated critical habitat were also reviewed.

Field Surveys

Moore Biological Consultants Diane Moore, M.S. and Colleen Laskowski, M.S. conducted field surveys of the site on March 20, 2020, July 2, 2021, and January 6 and July 13, 2022. The surveys were accomplished by walking throughout the site observing habitat conditions and noting surrounding land uses, general habitat types, and plant and wildlife species. The surveys included a delineation of potentially jurisdictional Waters of the U.S. as defined by the U.S. Army Corps of Engineers (ACOE) (1987; 2008) and an assessment of the site for special-status species, and suitable habitat for special-status species.

Habitats in the site, such as valley oak woodland and ruderal grassland, were identified in the field and mapped on high-resolution aerial photographs. The habitat boundaries were then combined with a 2020 Google Earth color aerial photograph in ArcGIS to quantify acreages and create a map of habitat types.

Aquatic resources in the project were delineated in accordance with the ACOE Wetland Delineation Manual (ACOE, 1987) and Arid West Region Regional Supplement (ACOE, 2008). The limit of federal jurisdiction of Waters of the U.S. [i.e., the ordinary high water mark (OHWM)] along the bank of the aquatic features was identified by physical characteristics including a natural water line impressed on the bank, shelves, destruction of terrestrial vegetation, and/or the presence of litter and debris. The boundaries of the aquatic habitats were mapped using a Trimble GeoXT Global Positioning System (GPS) unit. The GPS data was corrected using the nearest available base station and combined with a 2020 Google Earth color aerial photograph in ArcGIS to create an aquatic resources delineation map. The acreage of Waters of the U.S. was calculated as the area below the OHWM.

Trees in and near the site were inspected for raptor stick nests and assessed for the potential use by nesting raptors, especially Swainson's hawk. The March and July surveys also included a search for Swainson's hawks flying, perching, or foraging in or near the site.

Standard-protocol "burrow surveys" for burrowing owl (*Athene cunicularia*) were conducted as described in the California Department of Fish and Wildlife's (CDFW) *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012). The site was inspected for burrowing owls and/or burrows with evidence of burrowing owl occupancy such as pellets, feathers, and white-wash around the entrances to the burrows. Comprehensive visual inspection of potential burrowing owl habitat was accomplished walking meandering transects throughout the site, and scanning surrounding areas with binoculars.

BLUE ELDERBERRY SHRUB INVENTORY AND SURVEY: An inventory of blue elderberry shrubs in the site was undertaken. Most of the blue elderberry (*Sambucus nigra* ssp. *caerulea*) shrubs in the site were identified and mapped in the field on high-resolution aerial photographs. A few shrubs in dense canopy were mapped using the GPS unit. The blue elderberry shrub location data was then combined with a Google Earth 2020 color aerial photograph in ArcGIS to

generate a map of the locations of the blue elderberry shrubs in the site. The stems of the blue elderberry shrubs were also comprehensively inspected for fresh boreholes indicative of recently emerged valley elderberry longhorn beetles.

IV. RESULTS AND DISCUSSION

Setting

The project site is in the vicinity of the historic town of Bellota, in eastern San Joaquin County, California (Figure 1). The site is in Section 5, in Township 2 North, Range 9 East of the Linden topographic quadrangle (Figure 2). The site slopes down gently to the west and is at elevations of approximately 100 to 150 feet above mean sea level.

The site is located at SEWD's Bellota Weir facility, at the divergence of the Calaveras River (Figure 3). The Calaveras River splits in to two channels in the diversion pool, with the majority of the flows directed generally southwest and in to Mormon Slough. The Old Calaveras River branches off to the west and conveys far less water than Mormon Slough. The project site includes the most upstream reaches of the Old Calaveras River and Mormon Slough and adjacent upland areas, and upland areas adjacent to the most downstream reach of the Calaveras River.

Surrounding land uses in this portion of San Joaquin County are primarily agricultural, with widely scattered residences consisting primarily of ranchette-style homes. Most of the parcels in the greater project vicinity are farmed in orchard crops. There are also lesser acreages of vineyards and annual crops, and open grassland used primarily for livestock grazing.



Figure 3

Moore Biological
Consultants

0 100 200
Feet

Map Date: 06/29/2022
Aerial Source: Google Earth (09/2020)



AERIAL

Bellota Weir Modifications Project

San Joaquin County, CA

Vegetation and Habitat Types

The site is comprised of a mosaic of grassland areas, patches of trees, previously developed areas, and aquatic habitats. Vegetation communities in the project site include annual ruderal grassland, valley oak woodland, and riparian woodland. These vegetation communities and wildlife habitat types generally correspond to the California Annual Grassland series, Valley Oak series, and Arroyo Willow series (Sawyer and Keeler-Wolf, 1995). Riverine habitats include the Old Calaveras River and Mormon Slough. The site also contains a few developed areas and a strip of land along the edge of an orchard.

Ruderal Grassland: Historically, the California Annual Grassland series was the most widespread upland vegetation type occurring in the greater project vicinity and was comprised of native grass and weed species. In contrast, the grasslands in the site are subject to routine mowing and/or disking, moderately to highly disturbed, comprised of primarily non-native species, and best described as “ruderal grassland” vegetation. The project site contains 4.58+/- acres of ruderal grassland vegetation (Figure 4 and photographs in Appendix C).

The grasslands in the site consist of common grasses and weeds and are moderately to highly disturbed. Wild oats (*Avena* sp.), soft chess brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), foxtail (*Hordeum murinum*), and perennial ryegrass (*Lolium perenne*) are dominant grass species. Other grassland species such as black mustard (*Brassica nigra*), yellow star-thistle (*Centaurea solstitialis*), field bindweed (*Convolvulus arvensis*), wild radish (*Raphanus sativa*), prickly lettuce (*Lactuca serriola*), Italian thistle (*Carduus pycnocephalus*), rose clover (*Trifolium hirtum*), vetch (*Vicia villosa*), and filaree (*Erodium* sp.) are intermixed with the grasses. Table 1 is a list of plant species observed in the site.

Valley Oak Woodlands: The Valley Oak series (Sawyer and Keeler-Wolf, 1995) best describes the oak woodland habitats in the site. The project site contains 4.36+/- acres of valley oak woodland vegetation (Figure 4 and photographs in



TABLE 1
PLANT SPECIES OBSERVED IN THE SITE

| | |
|-------------------------------------|-----------------------|
| <i>Acer negundo</i> | box elder |
| <i>Acmispon americanus</i> | bird's-foot trefoil |
| <i>Ailanthus altissima</i> | tree-of-heaven |
| <i>Amsinckia menziesii</i> | rancher's fireweed |
| <i>Arundo donax</i> | giant reed |
| <i>Avena</i> sp. | wild oat |
| <i>Brassica nigra</i> | black mustard |
| <i>Bromus diandrus</i> | ripgut brome |
| <i>Bromus hordeaceus</i> | soft chess brome |
| <i>Bromus madritensis</i> | compact brome |
| <i>Capsella bursa var. pastoris</i> | shepherd's purse |
| <i>Carduus pycnocephalus</i> | Italian thistle |
| <i>Cedrus deodara</i> | deodar cedar |
| <i>Centaurea solstitialis</i> | yellow star-thistle |
| <i>Cerastium glomeratum</i> | mouse-eared chickweed |
| <i>Chamomilla suaveolens</i> | pineapple weed |
| <i>Cirsium vulgare</i> | bull thistle |
| <i>Claytonia perfoliate</i> | miner's lettuce |
| <i>Conium maculatum</i> | poison hemlock |
| <i>Convolvulus arvensis</i> | morning glory |
| <i>Cynodon dactylon</i> | Bermuda grass |
| <i>Cyperus eragrostis</i> | tall flat sedge |
| <i>Datura stramonium</i> | Jimsonweed |
| <i>Dittrichia graveolens</i> | stinkwort |
| <i>Epilobium brachycarpum</i> | annual fireweed |
| <i>Eremocarpus setigerus</i> | turkey mullein |
| <i>Erigeron canadensis</i> | Canadian horseweed |
| <i>Erodium botrys</i> | filaree |
| <i>Fraxinus latifolia</i> | Oregon ash |
| <i>Galium aparine</i> | common bedstraw |
| <i>Geranium molle</i> | geranium |
| <i>Geranium dissectum</i> | cut-leaf geranium |
| <i>Helenium puberulum</i> | rosilla |
| <i>Holcus lanatus</i> | common velvetgrass |

TABLE 1 (Continued)
PLANT SPECIES OBSERVED IN THE SITE

| | |
|-------------------------------------|------------------------|
| <i>Hordeum murinum</i> | foxtail |
| <i>Juglans californica</i> | black walnut |
| <i>Lactuca serriola</i> | prickly lettuce |
| <i>Lamium amplexicaule</i> | clasping henbit |
| <i>Liquidamber styraciflua</i> | sweetgum |
| <i>Lolium perenne</i> | perennial ryegrass |
| <i>Magnolia grandiflora</i> | magnolia |
| <i>Malva neglecta</i> | common mallow |
| <i>Marah fabaceus</i> | California manroot |
| <i>Melilotus alba</i> | white sweet clover |
| <i>Mentha pulegium</i> | pennyroyal |
| <i>Paspalum dilatatum</i> | golden crown grass |
| <i>Phytolacca americana</i> | pokeberry |
| <i>Poa annua</i> | annual bluegrass |
| <i>Polygonum aviculare</i> | prostrate knotweed |
| <i>Quercus lobata</i> | valley oak |
| <i>Quercus suber</i> | cork oak |
| <i>Raphanus sativus</i> | wild radish |
| <i>Rubus armeniacus</i> | Himalayan blackberry |
| <i>Rumex crispus</i> | curly dock |
| <i>Salix goodingii</i> | Gooding's black willow |
| <i>Salix exigua</i> | narrow-leaved willow |
| <i>Sambucus nigra ssp. caerulea</i> | blue elderberry |
| <i>Senecio vulgaris</i> | common groundsel |
| <i>Sonchus oleraceus</i> | common sowthistle |
| <i>Sorghum halepense</i> | Johnsongrass |
| <i>Silybum marianum</i> | milk thistle |
| <i>Tribulus terrestris</i> | puncture vine |
| <i>Trifolium hirtum</i> | rose clover |
| <i>Triteleia laxa</i> | Ithuriel's spear |
| <i>Urtica dioica</i> | stinging nettle |
| <i>Verbena lasiostachys</i> | common verbena |
| <i>Vicia villosa</i> | hairy vetch |
| <i>Vitis californica</i> | California wild grape |

Appendix C). This series is found both on the Valley Floor and the Sierra Foothills, with valley oaks as the sole or dominant tree species. While coastal live oaks (*Quercus agrifolia*), blue oaks (*Quercus douglasii*), and black oaks (*Quercus kelloggii*) may be present in lesser numbers, valley oak is the only native oak in the valley oak woodlands in the site. There are a few ornamental trees intermixed in the valley oak woodlands including cork oak (*Quercus suber*), magnolia (*Magnolia grandiflora*), deodar cedar (*Cedrus deodara*), and sweetgum (*Liquidamber styraciflua*). The understory herbaceous layer is composed of a subset of the annual grasses and weeds occurring in nearby grasslands.

Riparian Woodlands: The Arroyo Willow series (Sawyer and Keeler-Wolf, 1995) best describes the riparian woodland habitats in the site. The site contains 3.09+/- acres of riparian woodland vegetation (Figure 4 and photographs in Appendix C). Dominant trees in the riparian woodland vegetation near the Calaveras River, the Old Calaveras River and Mormon Slough include box elder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), Goodding's black willow (*Salix gooddingii*), narrow-leaved willow (*Salix exigua*), and black walnut (*Juglans californica*). California wild rose (*Rosa californica*), Himalayan blackberry (*Rubus armeniacus*), poison oak (*Toxicodendron diversilobum*), and California wild grape (*Vitis californica*) are dominant shrubs and vines in and near the site. There are also patches of giant reed (*Arundo donax*) in the riparian woodlands.

There are nine (9) blue elderberry shrubs in the riparian woodlands in the site, with 7 of the shrubs being along the south bank of the Old Calaveras River and 2 shrubs along the banks of Mormon Slough (Figure 5 and photographs in Appendix C). There is also a shrub in the alcove of the old office building that will be demolished. The blue elderberry shrubs range from approximately 8 to 15 feet in height and all of the shrubs have multiple stems.

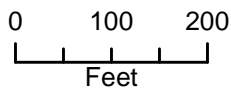
Riverine: Aquatic (riverine) habitats in and adjacent to the site include the Old Calaveras River and Mormon Slough. The project site contains 2.39+/- acres of riverine habitats (Figure 4 and photographs in Appendix C). These aquatic habitats have directional flow, generally flowing east to west.

C:\FEC_INCI\Projects\Moore Biological\Bellota Weir\2022\MXD\bellota_weir_ecl_figure_5_v3.mxd



Figure 5

Moore Biological
Consultants



Map Date: 07/14/2022
Aerial Source: Google Earth (09/2020)



Blue Elderberry Shrubs

Bellota Weir Modifications Project

San Joaquin County, CA

The riverine habitats, at and near the waterline, support a generally narrow and discontinuous fringe of willow seedlings, tall flat sedge (*Cyperus eragrostis*), pennyroyal (*Mentha pulegium*), and other emergent wetland vegetation.

Orchard: Most of the parcels surrounding the project site are planted in intensively cultivated orchards and vineyards. The majority of the orchards in the vicinity are walnuts and almonds. The project site contains 0.25+/- acres of land along the edge of a walnut orchard (Figure 4).

Urban/Developed: The project site contains 0.82+/- acres of previously developed areas that are best described as urban or developed (Figure 4 and photographs in Appendix C). Urban/ developed habitats in the site include buildings, paved and gravel areas, and areas of rock.

Wildlife

The ruderal grasslands in the site are routinely mowed and/or disked and provide low-quality, but potentially suitable provide foraging habitat for a variety of bird species. In contrast, the riparian woodlands and riparian scrub associated with the riparian corridors in the site provide habitat for a wide variety of wildlife species. In addition to resident wildlife, the project site provides seasonal habitats for a wide variety of migratory wildlife, including numerous birds. Wildlife species documented in the project site are listed in Table 2.

A variety of bird species were observed during the field surveys; the majority of these are common species found in agricultural and riparian areas of San Joaquin County. A few birds were observed flying around and over the site and perching in trees and shrubs during the field surveys. Great egret (*Casmerodius albus*), mallard (*Anas platyrhynchos*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), California scrub jay (*Aphelocoma californica*), acorn woodpecker (*Melanerpes formicivorus*), northern flicker (*Colaptes auratus*), and black phoebe (*Sayornis nigricans*) are representative avian species observed in the site.

TABLE 2
WILDLIFE SPECIES DOCUMENTED IN THE SITE

Birds

| | |
|--------------------------|---------------------------------|
| Double-crested cormorant | <i>Phalacrocorax auritis</i> |
| Great blue heron | <i>Ardea herodias</i> |
| Great egret | <i>Casmerodius albus</i> |
| Canada goose | <i>Branta canadensis</i> |
| Wood duck | <i>Aix sponsa</i> |
| Mallard | <i>Anas platyrhynchos</i> |
| Osprey | <i>Pandion haliaetus</i> |
| Turkey vulture | <i>Cathartes aura</i> |
| Bald eagle | <i>Haliaeetus leucocephalus</i> |
| Red-shouldered hawk | <i>Buteo lineatus</i> |
| Red-tailed hawk | <i>Buteo jamaicensis</i> |
| Wild turkey | <i>Meleagris gallopavo</i> |
| California gull | <i>Larus californicus</i> |
| Rock dove | <i>Columba livia</i> |
| Mourning dove | <i>Zenaida macroura</i> |
| Great-horned owl | <i>Bubo virginianus</i> |
| Acorn woodpecker | <i>Melanerpes formicivorus</i> |
| Northern flicker | <i>Colaptes auratus</i> |
| Black phoebe | <i>Sayornis nigricans</i> |
| Tree swallow | <i>Tachycineta bicolor</i> |
| Cliff swallow | <i>Petrochelidon pyrrhonota</i> |
| California scrub jay | <i>Aphelocoma californica</i> |
| American crow | <i>Corvus brachyrhynchos</i> |
| Bushtit | <i>Psaltiriparus minimus</i> |
| Ruby-crowned kinglet | <i>Regulus calendula</i> |
| Western bluebird | <i>Sialia mexicana</i> |
| American robin | <i>Turdus migratorius</i> |

TABLE 2 (Continued)
WILDLIFE SPECIES DOCUMENTED IN THE SITE

| | |
|------------------------|--------------------------------|
| Northern mockingbird | <i>Mimus polyglottos</i> |
| European starling | <i>Sturnus vulgaris</i> |
| Spotted towhee | <i>Pipilo maculatus</i> |
| Golden-crowned sparrow | <i>Zonotrichia atricapilla</i> |
| Bullock's oriole | <i>Icterus bullockii</i> |
| House finch | <i>Carpodacus mexicanus</i> |

Mammals

| | |
|---------------|----------------------------|
| Pocket gopher | <i>Thomomys bottae</i> |
| Raccoon | <i>Procyon lotor</i> |
| Mule deer | <i>Odocoileus hemionus</i> |

Reptiles and Amphibians

| | |
|----------------------|--------------------------------|
| Western fence lizard | <i>Sceloporus occidentalis</i> |
| Bullfrog | <i>Rana catesbeiana</i> |
| Pacific chorus frog | <i>Pseudacris regilla</i> |

There are numerous trees in and near the site that are suitable for nesting raptors and other protected migratory birds, including Swainson's hawk. However, the site is also along the east edge of the nesting range of this species and Swainson's hawks are not widespread in this part of the County. It is likely common raptor species utilize habitats in the site for nesting each year. Red-tailed hawks (*Buteo jamaicensis*) and red-shouldered hawks (*Buteo lineatus*) were observed flying over the site, perching in trees in and near the site, and calling during the May and July surveys; these raptors were likely nesting in trees near the site. There is an osprey (*Pandion haliaetus*) nest on a nesting platform just north of the Old Calaveras River (see photographs in Appendix C).

Given the presence of trees and shrubs in and near the site, and emergent wetland vegetation in the Calaveras River, Old Calaveras River, and Mormon Slough, it is likely a variety of songbirds and other protected birds nest within trees, shrubs, and other vegetation in and adjacent to the site each year. There is a notable heron and egret rookery along the north bank of the Calaveras River just east of the site (see photographs in Appendix C). Ground-nesting songbirds such as killdeer (*Charadrius vociferus*) and red-winged blackbird (*Agelaius phoeniceus*) may nest in the grasslands or on the ground in the site.

A variety of mammals common to riparian and agricultural areas are expected to occur in the site. Burrows from Botta's pocket gopher (*Thomomys bottae*) and tracks from raccoon (*Procyon lotor*) were observed in the site during the field surveys. Scat from California mule deer (*Odocoileus hemionus californicus*) was also observed. Common mammals such as coyote (*Canis latrans*), black-tailed hare (*Lepus californicus*), striped skunk (*Mephitis mephitis*), desert cottontail (*Sylvilagus audubonii*), and Virginia opossum (*Didelphis virginiana*) may occur in the site. A few species of common bats may roost in some of the trees in the site. The site also provides habitat for a number of species of small rodents including mice (*Mus musculus*, *Reithrodontomys megalotis*, and *Peromyscus maniculatus*) and voles (*Microtus californicus*).

Based on habitat types present, a variety of amphibians and reptiles may use habitats in the study area. Western fence lizard (*Sceloporus occidentalis*) was the only reptile observed in the study area; American bullfrog (*Rana catesbeiana*) and Pacific chorus frog (*Pseudacris regilla*) were the only amphibians observed. Red-eared slider (*Trachemys scripta elegans*) and western pond turtle (*Emys marmorata*) may be present in the Calaveras River, Old Calaveras River, and Mormon Slough in or near the project site. Common reptiles and amphibians such as western skink (*Plestiodon skiltonianus*), northern alligator lizard (*Elgaria coerulea*), common garter snake (*Thamnophis sirtalis*), and gopher snake (*Pituophis melanoleucus*) are known to occur in the greater project vicinity and may occur in the site.

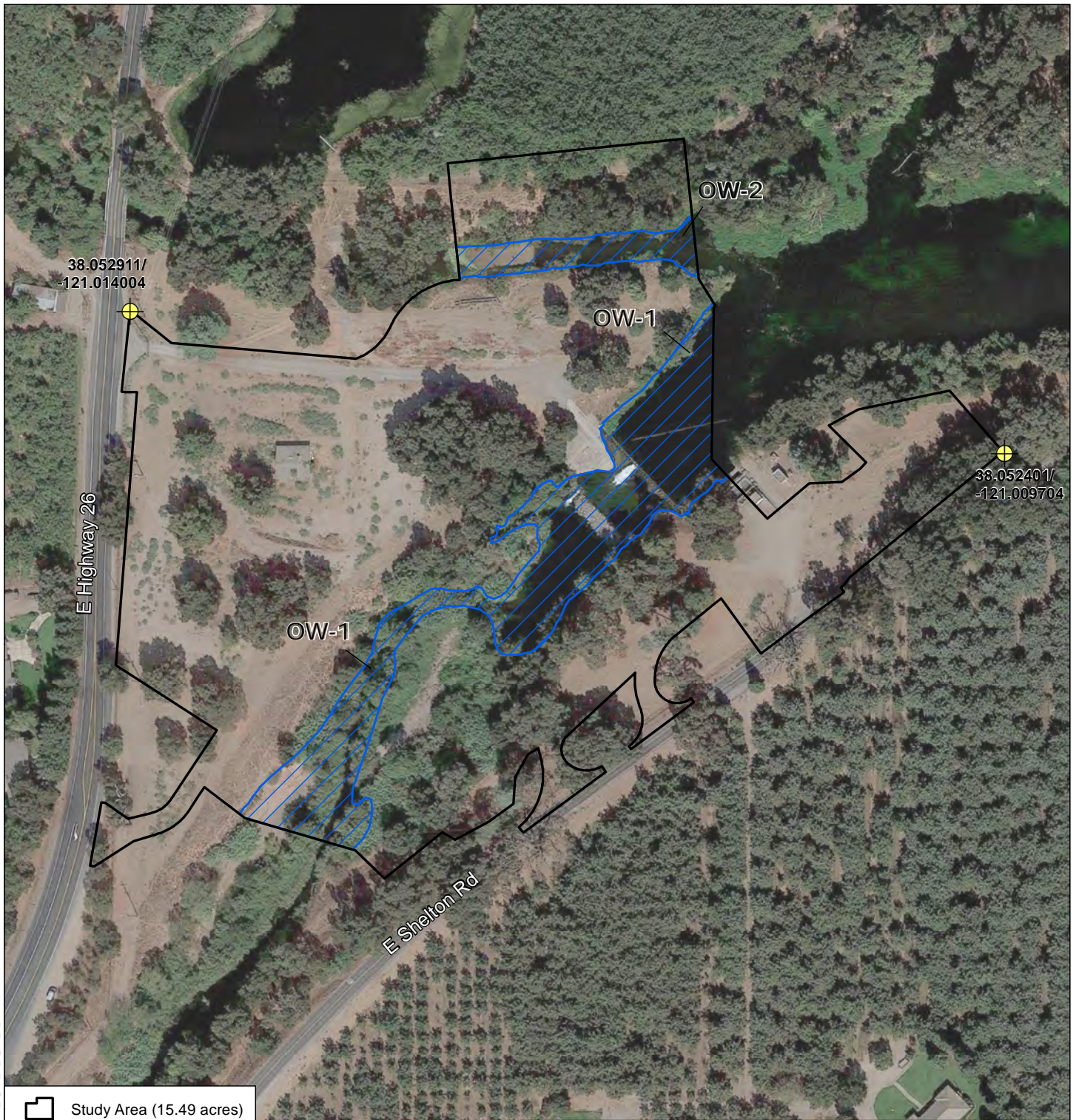
Aquatic Resources

A total of 2.39+/- acres of aquatic habitats were delineated within the site (Figure 6 and photographs in Appendix C). This total includes 2.05+/- acres of Mormon Slough and 0.34+/- acres of the Old Calaveras River. The remainder of the site is vegetated in ruderal upland grassland vegetation, with soils that appear well draining. While the Calaveras River channel is just outside (upstream) of the project site boundary, the east tip of the site is adjacent to the south bank of the Calaveras River. The aquatic resources delineation will be submitted to ACOE for verification.

The Calaveras River, Old Calaveras River, and Mormon Slough are Waters of the U.S. subject Section 404 of the Clean Water Act. These waterways also fall under the jurisdiction of CDFW, Regional Water Quality Control Board (RWQCB), and the Central Valley Flood Protection Board (CVFPB). The OHWMs along the banks of the rivers are the limits of Clean Water Act jurisdiction; there are no adjacent wetlands along these features.

The Calaveras River and Mormon Slough riparian corridors in and adjacent to the site consist of broad alluvial channels associated with relatively steep banks. The mean width of Mormon Slough within the site is approximately 90 feet from OHWM to OHWM. In contrast, the Old Calaveras River is only about 40 feet wide. The open water habitats are primarily low gradient run and pool habitats with gravel, cobble, and clay substrates. The river banks are vegetated with riparian vegetation, and willows, box elder, and Oregon ash comprise the dominant overstory species at and near the water line; valley oaks are also present a bit higher on the banks.

The project will result in impacts to 2.05+/- acres of Waters of the U.S. (Figure 7), primarily consisting of permanent impacts through the placement of fill in approximately 1.25 acres of Waters of the U.S. An additional 0.8+/- acres adjacent to the project footprint will be subject to grading and temporary construction disturbance related to construction equipment and personnel



 Study Area (15.49 acres)

Data Disclaimer:

The delineation has been done in accordance with the 1987 Wetlands Delineation Manual, US Army Corps of Engineers and the 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. The boundaries and jurisdictional status of all waters shown on this map are preliminary and subject to verification by the U.S. Army Corps of Engineers.

AQUATIC RESOURCES

| Feature | Label | Area | |
|--|----------------------------|----------------|-------------|
| | | (sf) | (acre) |
|  Other Waters | OW-1 (Mormon Slough) | 89,304 | 2.05 |
| | OW-2 (Old Calaveras River) | 14,687 | 0.34 |
| Total | | 103,991 | 2.39 |

Figure 6

Moore Biological
Consultants

0 100 200
Feet



Map Date: 06/29/2022
Aerial Source: Google Earth (09/2020)

Aquatic Resources

Bellota Weir Modifications Project

San Joaquin County, CA

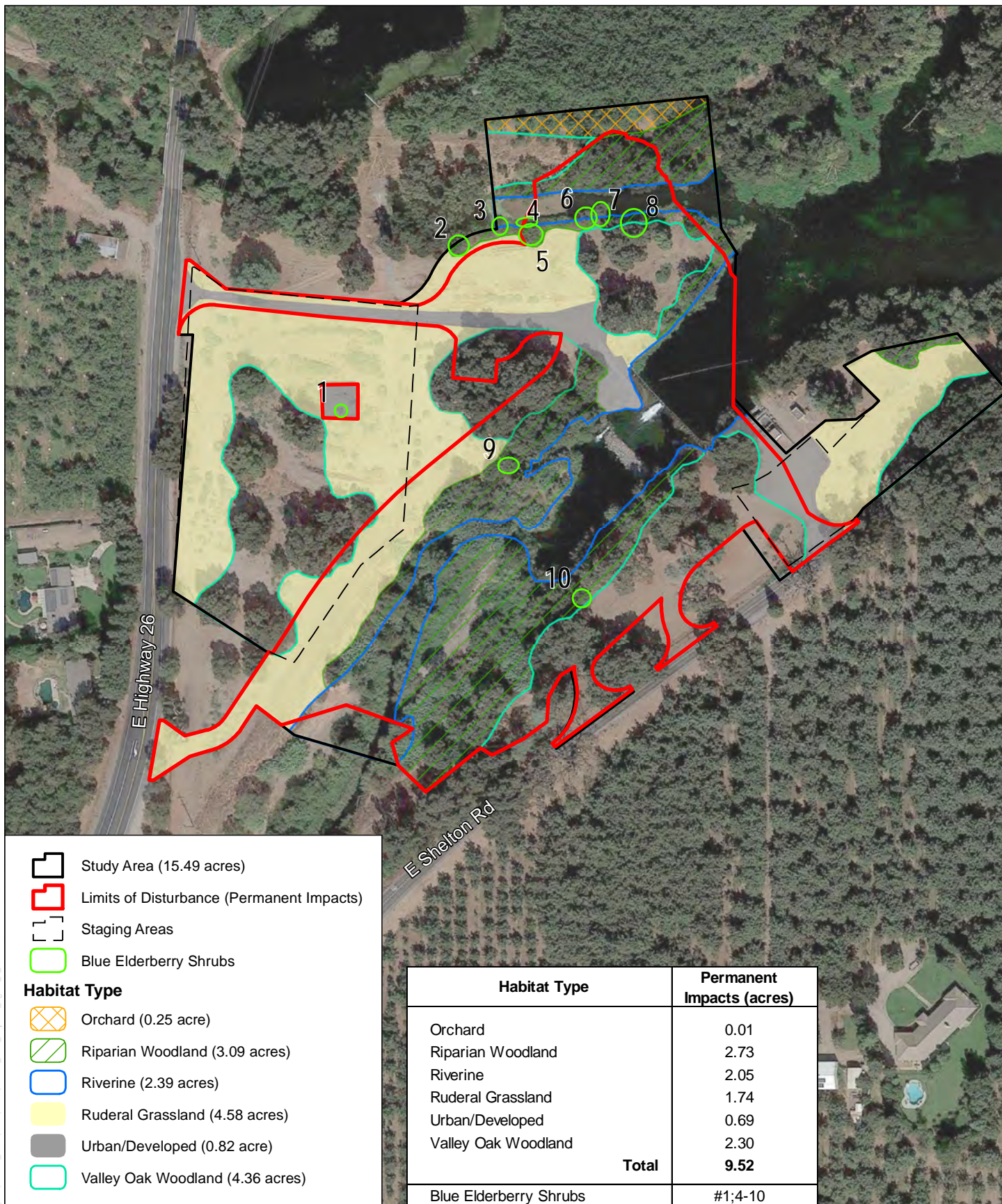


Figure 7

Moore Biological
Consultants

0 100 200
Feet

Map Date: 07/19/2022
Aerial Source: Google Earth (09/2020)



Biological Resources Impacts

Bellota Weir Modifications Project

San Joaquin County, CA

accessing the work area; temporary cofferdams may also be located within the temporary construction disturbance area. While this disturbance area is located outside the footprint or the proposed armored channel and other hardscape, much of it will be subject to some fill related to grading. Due to the magnitude of temporary construction disturbance area and placement of fill, all work in Waters of the U.S. is viewed as permanent impacts and subject to Clean Water Act Section 404 permitting.

The project will result in net increases in aquatic resources functions and values in Mormon Slough and the Old Calaveras River and meets the criteria for authorization under Nationwide Permit No. 27. Compensatory mitigation for impacts to 2.05+/- acres of Waters of the U.S. in Mormon Slough and the Old Calaveras River will not be required.

Special-Status Species

The likelihood of occurrence of listed, candidate, and other special-status plant and wildlife species in the project site is generally low. Table 3 provides a summary of the listing status and habitat requirements of special-status species that have been documented in the greater project vicinity or for which there is potentially suitable habitat in the greater project vicinity. This table also includes an assessment of the likelihood of occurrence of each of these species in the site. The evaluation of the potential for occurrence of each species is based on the distribution of regional occurrences (if any), habitat suitability, and field observations.

Special-Status Plants: Ten (10) special-status plant species were identified in the CNDDB (2022) search area: lone manzanita (*Arctostaphylos myrtifolia*), Hoover's calycadenia (*Calycadenia hooveri*), Tuolumne button celery (*Eryngium pinnatisectum*), delta button celery (*Eryngium racemosum*), Parry's horkelia (*Horkelia parryi*), Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*), legenere (*Legenere limosa*), pincushion navarretia (*Navarretia myersii* var. *myersii*), Patterson's navarretia (*Navarretia paradoxicala*), and Greene's tuctoria (*Tuctoria*

greenei) (Table 3 and Appendix B). Fleshy owl's clover (*Castilleja campestris* ssp. *succulenta*) is the only plant identified on the USFWS IPaC Trust Report.

The special-status plants identified occur in specialized habitats such as vernal pools, cismontane woodland, chaparral, or meadows and seeps. The Old Calaveras River and Mormon Slough do not provide suitable aquatic habitat for any of the special-status plants identified in the CNDDDB or the IPaC Trust Report. The grasslands in the site have been disturbed by construction and operation of the irrigation intake, and periodic disking and/or mowing for weed abatement. No special-status plants were observed in the site. Further, no high quality or even moderately suitable habitat for special-status plants was observed in the site. Due to a lack of suitable habitat, it is unlikely any special-status plants occur in the site.

Special-Status Wildlife: The potential for intensive use of habitats within the project site by special-status wildlife species is generally low. Swainson's hawk, bank swallow (*Riparia riparia*), burrowing owl, tricolored blackbird (*Agelaius tricolor*), yellow-breasted chat (*Icteria virens*), pallid bat (*Antrozous pallidus*), giant garter snake (*Thamnophis gigas*), California tiger salamander (*Ambystoma californiense*), western pond turtle, western spadefoot (*Spea hammondi*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) are special-status wildlife species identified in the CNDDDB (2022) query. The USFWS IPaC Trust Report includes a few of these same species and also includes Conservancy fairy shrimp (*Branchinecta conservatio*), and monarch butterfly (*Danaus plexippus*).

While the project vicinity may have provided habitat for several special-status wildlife species in the past, agriculture, development, and construction and maintenance of roads and irrigation facilities and/or adjacent to the site have modified the natural habitats and associated potential to support special-status wildlife species. Of the wildlife species in Table 3, Swainson's hawk, tricolored blackbird, western pond turtle, and valley elderberry longhorn beetle have

TABLE 3

SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

| Common Name | Scientific Name | Federal Status ¹ | State Status ¹ | CNPS List ² | Habitat | Likelihood of Occurrence in the Site |
|------------------------|--|-----------------------------|---------------------------|------------------------|---|---|
| PLANTS | | | | | | |
| lone manzanita | <i>Arctostaphylos myrtifolia</i> | T | None | 1B | lone clay soils in Chaparral or Cismontane woodland habitats. | Unlikely: the site does not provide suitable habitat for lone Manzanita; no lone chaparral habitats or lone formation soils were observed. The nearest occurrence of this species in the CNDDDB (2022) search area is approximately 15 miles northeast of the project site. |
| Hoover's calycadenia | <i>Calycadenia hooveri</i> | None | None | 1B | Rocky areas within valley and foothill grassland and cismontane woodlands. | Unlikely: there is no suitable habitat in the site to support Hoover's calycadenia; the grasslands in the site are highly disturbed. The nearest occurrence of Hoover's calycadenia in the CNDDDB (2022) search area is approximately 11 miles northeast of the site. |
| Fleshy owl's clover | <i>Castilleja campestris ssp. succulenta</i> | T | E | 1B | Vernal pools. | Unlikely: there are no vernal pools in the site to support this species. There are no occurrences of succulent owl's clover in the CNDDDB (2022) search area. The sites are not within designated critical habitat for succulent owl's clover (USFWS, 2005a). |
| Tuolumne button celery | <i>Eryngium pinnatisectum</i> | None | None | 1B | Vernal pools, cismontane woodland; found within mesic areas. | Unlikely: there are no vernal pools or other suitable habitats in the site for this species. The nearest occurrence of Tuolumne button celery in the CNDDDB (2022) search area is approximately 10 miles north of the site. |
| Delta button celery | <i>Eryngium racemosum</i> | None | E | 1B | Seasonally inundated (usually floodplain) riparian scrub with a clay substrate. | Unlikely: there is no suitable habitat for this species in the site; on-site soils are loamy. The nearest occurrence of delta button celery in the CNDDDB (2022) search area is approximately 8 miles southwest of the project site. |
| Parry's horkelia | <i>Horkelia parryi</i> | None | None | 1B | Chaparral, and cismontane woodland, almost always on lone formation soils. | Unlikely: the site does not contain lone formation soils. The nearest occurrence of Parry's horkelia in the CNDDDB (2022) search area is approximately 15 miles northeast of the project site. |

TABLE 3

SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

| Common Name | Scientific Name | Federal Status ¹ | State Status ¹ | CNPS List ² | Habitat | Likelihood of Occurrence in the Site |
|------------------------|---|-----------------------------|---------------------------|------------------------|---|--|
| Ahart's dwarf rush | <i>Juncus leiospermus</i> var. <i>ahartii</i> | None | None | 1B | Vernal pool margins and seasonal wetlands. | Unlikely: there are no vernal pools or seasonal wetlands in the site. The nearest occurrence of Ahart's dwarf rush in the CNDDDB (2022) search area is located approximately 7 miles northeast of the project site. |
| Legenere | <i>Legenere limosa</i> | None | None | 1B | Vernal pools. | Unlikely: there are no vernal pools in the site. The nearest occurrences of legenere in the CNDDDB (2022) search area is approximately 9 miles northeast of the site. |
| Pincushion navarretia | <i>Navarretia myersii</i> var. <i>myersii</i> | None | None | 1B | Vernal pools and seasonal wetlands in valley and foothill grassland habitats. | Unlikely: there are no vernal pools or seasonal wetlands in the site and on-site grasslands are highly disturbed. The nearest occurrence of this species in the CNDDDB (2022) search area is approximately 6.5 miles northeast of the site. |
| Patterson's navarretia | <i>Navarretia paradoxiclara</i> | None | None | 1B | Meadows and seeps | Unlikely: the site does not provide suitable habitat for Patterson's navarretia. The nearest occurrence of this species in the CNDDDB (2022) search area is approximately 12.5 miles northeast of the site. |
| Greene's tuctoria | <i>Tuctoria greenei</i> | E | R | 1B | Vernal pools within the Central Valley. | Unlikely: there are no vernal pools or seasonal wetlands in the site. The nearest occurrences of Greene's tuctoria recorded in the CNDDDB (2022) search area is approximately 9 miles southeast of the site. The site is not in designated critical habitat for Greene's tuctoria (USFWS 2005a). |
| WILDLIFE | | | | | | |
| Birds | | | | | | |
| Bank swallow | <i>Riparia riparia</i> | None | T | N/A | Nests colonially in riparian habitats; requires vertical banks and cliffs with fine-textured soils. | Unlikely: there is no suitable nesting habitat for this species in or adjacent to the site and no bank swallows were observed during the field surveys. There is only one occurrence of bank swallows in the CNDDDB (2022) search area, approximately 11.5 miles northwest of the site. |

TABLE 3

SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

| Common Name | Scientific Name | Federal Status ¹ | State Status ¹ | CNPS List ² | Habitat | Likelihood of Occurrence in the Site |
|----------------------|---------------------------|-----------------------------|---------------------------|------------------------|---|--|
| Swainson's hawk | <i>Buteo swainsoni</i> | None | T | N/A | Nesting: large trees, usually within riparian corridors. Foraging: agricultural fields and annual grasslands. | Low: trees in and near the site are suitable for nesting Swainson's hawks, but most of the parcels near the site are orchards. Swainson's hawks prefer nesting in close proximity to suitable foraging habitat. The site is also along the east edge of the nesting range of this species and no Swainson's hawks were observed in or near the site. There are only 5 occurrences of this species in the CNDDDB (2022) within 5 miles of the site; the nearest occurrence is a historical record (1923) mapped nonspecifically around the town of Bellota. |
| Tricolored blackbird | <i>Agelaius tricolor</i> | None | T | N/A | Requires open water and protected nesting substrate, usually cattails and riparian scrub with surrounding foraging habitat. | Low: the project site contains limited and fragmented potential nesting habitat for tricolored blackbird and the disturbed grasslands in the site provide low-quality foraging habitat for this species. The nearest occurrence of tricolored blackbird in the CNDDDB (2022) in the search area is approximately 1 mile southeast of the project site. |
| Yellow-breasted chat | <i>Icteria virens</i> | None | SC | N/A | Nests in willow thickets and brushy tangles associated with streams. | Unlikely: while the site provides potentially suitable nesting habitat for yellow-breasted chat, this species rarely breeds in the Central Valley. The only record of this species in the CNDDDB (2022) search area is a 1995 occurrence approximately 12 miles northwest of the project site, near Camanche dam. |
| Burrowing owl | <i>Athene cunicularia</i> | None | SC | N/A | Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. | Unlikely: the grasslands in the site are routinely mowed and do not provide suitable habitat for burrowing owl. No burrowing owls, ground squirrels, or ground squirrel burrows were observed in the site. The nearest occurrence of burrowing owl in the CNDDDB (2022) search area is approximately 8 miles southeast of the project site. |

TABLE 3

SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

| Common Name | Scientific Name | Federal Status ¹ | State Status ¹ | CNPS List ² | Habitat | Likelihood of Occurrence in the Site |
|----------------------------------|--------------------------------|-----------------------------|---------------------------|------------------------|--|---|
| Mammals | | | | | | |
| Pallid bat | <i>Antrozous pallidus</i> | None | SC | N/A | Open and dry habitats with rocky areas for roosting. | Unlikely: there are no rocky areas in or near the site for roosting. The only occurrence of this species in the CNDDDB (2022) search area is a record mapped nonspecifically around the town of Farmington, approximately 9 miles south of the site. |
| Reptiles & Amphibians | | | | | | |
| Giant garter snake | <i>Thamnophis gigas</i> | T | T | N/A | Freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. | Unlikely: the Calaveras River, Old Calaveras River, and Mormon Slough do not contain suitable aquatic habitat for giant garter snake; this species is not known to occupy larger river systems, especially those in foothill setting so far inland from the delta. There only occurrent of this species in the CNDDDB (2022) search area is a historical record (1987) approximately 9 miles southwest of the project site. |
| California tiger salamander | <i>Ambystoma californiense</i> | T | T | N/A | Seasonal water bodies without fish (i.e., vernal pools and stock ponds) near grassland/ woodland habitats with summer refugia (i.e., burrows). | Unlikely: there is no suitable breeding habitat in or near the site for California tiger salamander. The nearest record of this species in the CNDDDB (2022) within the search area is a historical record (1923) mapped nonspecifically around the town of Bellota. The site is not in designated critical habitat for California tiger salamander (USFWS, 2005b). |
| Western pond turtle | <i>Emys marmorata</i> | None | SC | N/A | Ponds, marshes, streams, and ditches with emergent aquatic vegetation and basking areas. | Low: while the Calaveras River provides potentially suitable habitat for western pond turtle, the disturbed grasslands in the site provide low-quality nesting habitat. The closest occurrence of western pond turtle in the CNDDDB (2022) search area is approximately 11 miles north of the project site. |
| Western spadefoot | <i>Spea hammondi</i> | None | SC | N/A | Breeds and lays eggs in seasonal water bodies such as deep vernal pools or stock ponds. | Unlikely: there is no suitable aquatic habitat for western spadefoot in or near the site. The nearest occurrence of western spadefoot in the CNDDDB (2022) search area is approximately 4 miles north of the project site. |

TABLE 3

SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED OR POTENTIALLY-OCCURRING IN THE PROJECT VICINITY

| Common Name | Scientific Name | Federal Status ¹ | State Status ¹ | CNPS List ² | Habitat | Likelihood of Occurrence in the Site |
|-----------------------------------|--|-----------------------------|---------------------------|------------------------|--|---|
| Invertebrates | | | | | | |
| Vernal pool fairy shrimp | <i>Branchinecta lynchi</i> | T | None | N/A | Vernal pools. | None: there are no vernal pools or seasonal wetlands in the site. The nearest occurrence of this species in the CNDDDB (2022) search area is 5 miles south of the project site. The site is not within designated critical habitat for vernal pool fairy shrimp (USFWS 2005a). |
| Conservancy fairy shrimp | <i>Branchinecta conservatio</i> | E | None | N/A | Vernal pools. | None: there are no vernal pools or seasonal wetlands in the site. There are no occurrences of this species recorded in the CNDDDB (2022) within the search area. The site is not in designated critical habitat for Conservancy fairy shrimp (USFWS, 2005a). |
| Vernal pool tadpole shrimp | <i>Lepidurus packardii</i> | E | None | N/A | Vernal pools. | None: there are no vernal pools or seasonal wetlands in the project site. The nearest occurrence of this species in the CNDDDB (2022) search area is approximately 4.5 miles south of the project site. The site is not in designated critical habitat for vernal pool tadpole shrimp (USFWS 2005a). |
| Valley elderberry longhorn beetle | <i>Desmocerus californicus dimorphus</i> | T | None | N/A | Elderberry shrubs, usually in Central Valley riparian habitats. | Low: while there are 10 blue elderberry shrubs in the project site, no boreholes indicative of valley elderberry longhorn beetle were observed on the stems of the shrubs. The nearest occurrence of valley elderberry longhorn beetle in the CNDDDB (2022) search area is approximately 2.5 miles northeast of the site. |
| Monarch butterfly | <i>Danaus plexippus</i> | C | None | N/A | Variety of habitats in California; larvae dependent on milkweed. | Unlikely: monarch butterfly is not expected to occur in the site and no extensive areas of milkweed was observed in the site. There are no occurrences of this species in the CNDDDB (2022) search area. |

¹ T = Threatened; E = Endangered; C = Candidate for Listing; SC= State of California Species of Special Concern.

² CNPS List 1B includes species that are rare, threatened, or endangered in California and elsewhere.

potential to occur in the site on more than a transitory or very occasional basis. Other special-status birds may fly over or forage in the area on occasion, but are not expected to nest or extensively utilize the habitats within the project site. Species with the greatest potential to occur at and/or be impacted by the project are discussed below.

SWAINSON'S HAWK: The Swainson's hawk is a migratory hawk listed by the State of California as a Threatened species. The Migratory Bird Treaty Act (MBTA) and Fish and Game Code of California (FGCC) protect Swainson's hawks year-round, as well as their nests during the nesting season (March 1 through September 15). Swainson's hawks are found throughout much of the Central Valley primarily during their breeding season, a relatively small population is known to winter in the San Joaquin Valley.

Swainson's hawks prefer nesting sites that provide sweeping views of nearby foraging grounds consisting of grasslands, irrigated pasture, hay, and wheat crops. Most Swainson's hawks are migratory, wintering in Mexico and Central America and breeding in California and elsewhere in the western United States. This raptor generally arrives in the Central Valley in mid-March, and begins courtship and nest construction immediately upon arrival at the breeding sites. The young fledge in early July, and most Swainson's hawks leave their breeding territories by late August.

No Swainson's hawks were observed in or near the site. There are only 5 occurrences of this species in the CNDDDB (2022) within 5 miles of the site; the nearest occurrence is a historical record (1923) mapped nonspecifically around the town of Bellota (Appendix B). The next nearest record of this species is over 3 miles from the site.

The site is along the east edge of the nesting range of this species and Swainson's hawks are not widespread in this part of the County. Although there are several suitable nest trees in and surrounding the site, land uses in the area are not compatible for Swainson's hawk. The site is primarily surrounded by

orchards, which is not a compatible land use for foraging Swainson's hawk, and reduces the likelihood that Swainson's hawk would nest in the area. Swainson's hawks prefer nesting in close proximity to suitable foraging habitat. Grasslands and croplands in other portions of San Joaquin County west of the site offer much more abundant and higher-quality habitat for foraging Swainson's hawk. Swainson's hawks likely fly over the site on occasion, but are unlikely to nest in or adjacent to the site.

Several potential Swainson's hawk nest trees will be removed when vegetation is cleared from 5.03+/- acres of valley oak and riparian woodlands within the limits of disturbance (Figure 7). Construction staging will occur in 1.86+/- acres of valley oak and riparian woodlands that contain trees that could also potentially be used by nesting Swainson's hawks (Figure 8).

Swainson's hawks could be adversely affected by construction noise and disturbance if they nested in or near the site during construction. The removal of potentially suitable nest trees along the river corridor would result in a less-than-significant reduction of potential nesting habitat of this species. The conversion of less than 2 acres of ruderal grassland to project facilities would result in a minor and less-than-significant reduction of potential Swainson's hawk foraging habitat.

TRICOLORED BLACKBIRD: The tricolored blackbird is a State of California Species threatened species and is also protected by the federal MBTA and FGCC.

Tricolored blackbirds are colonial nesters requiring very dense stands of emergent wetland vegetation and/or dense thickets of wild rose or blackberries for nesting. Preferred nesting substrates are expansive stands of cattails and tules adjacent to open water. Tricolored blackbirds forage in annual grasslands and cropland. There are a few scattered records of this species in the CNDDB (2022) search area in the greater project vicinity, with the nearest record approximately 1 mile southeast of the project site.

Tricolored blackbirds were not observed in the site during the field surveys. However, patches of willows, emergent wetland vegetation, wild rose, and



Study Area (15.49 acres)

Temporary Disturbance

Staging Areas

Blue Elderberry Shrubs

Habitat Type

Orchard (0.25 acre)

Riparian Woodland (3.09 acres)

Riverine (2.39 acres)

Ruderal Grassland (4.58 acres)

Urban/Developed (0.82 acre)

Valley Oak Woodland (4.36 acres)

| Habitat Type | Temporary Disturbance (acres) |
|------------------------|-------------------------------|
| Riparian Woodland | 0.06 |
| Ruderal Grassland | 2.72 |
| Urban/Developed | 0.11 |
| Valley Oak Woodland | 1.80 |
| Total | 4.69 |
| Blue Elderberry Shrubs | #2,3 |

Figure 8

Moore Biological
Consultants

0 100 200
Feet



Map Date: 07/19/2022
Aerial Source: Google Earth (09/2020)

Temporary Construction Disturbance

Bellota Weir Modifications Project

San Joaquin County, CA

blackberry brambles along the banks of the Calaveras River, Old Calaveras River, and Mormon Slough provide suitable nesting habitat for this species. Tricolored blackbirds could be adversely affected by construction noise and disturbance if they nested in or near the site during construction.

WESTERN POND TURTLE: The western pond turtle is a state species of concern, but is not a listed species at the state or federal level. Western pond turtles are associated with permanent or nearly permanent bodies of water with adequate basking sites such as logs, rocks or open mud banks. Pond turtles construct nests in sandy banks along slow moving streams and ponds in the spring and the young usually hatch in 2 to 3 months. The nearest occurrence of western pond turtle recorded in the CNDDDB (2022) search area is approximately 11 miles north of the project site.

Western pond turtle may occur in the Calaveras River, Old Calaveras River, and Mormon Slough in or near the project site, but are unlikely to nest in uplands adjacent to the rivers due to the steep and near-vertical river banks. The grasslands adjacent to the river in the site are also routinely mowed and/or disked, providing low quality nesting habitat for this species. Further, there are no sandy banks within the site, which western pond turtle prefer as a nesting substrate and the banks of the river notably lack large woody debris for basking.

The project is not expected to result in adverse impacts to western pond turtle. This species is unlikely to nest in uplands in the site. Further, the species quickly retreats from humans and turtles, if any, present in Calaveras River, Old Calaveras River, or Mormon Slough would be expected to swim away from project activities.

VALLEY ELDERBERRY LONGHORN BEETLE: The valley elderberry longhorn beetle (VELB) is listed as a federally threatened species and its host plant is the blue elderberry shrub. Eggs are laid on the leaves or stems of the shrubs and upon hatching, the larvae bore in to the stem where they remain for 2+/- years feeding on the interior portions of the stems. Following several larval instars, the larvae

chew an exit hole in the stem, pupate, and emerge after approximately a month as an adult. The adults live only 4 to 5 days, mate, lays eggs, and die. The nearest occurrence of valley elderberry longhorn beetle in the CNDDDB (2022) search area is approximately 2.5 miles northeast of the project site.

The USFWS (2017) *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* direct that, if possible, elderberry shrubs should be avoided by a ground disturbance set back of at least 165 feet from the drip line of each shrub. A number of measures are also recommended to avoid and minimize project impacts to VELB and/or its habitat including fencing, worker training, and timing of construction, among others. In cases where complete avoidance is not feasible, the Framework recommends compensatory mitigation for the loss of actual or potential VELB habitat.

Mitigation for impacts to actual or potential VELB habitat is usually achieved through the purchase of credits at an USFWS-approved mitigation bank, and transplantation of the impacted shrub to the bank, if feasible. In the case of shrubs in a riparian setting such as at the project site, the Framework recommends compensation at a ratio of 3:1 for impacted riparian habitat via the purchase of credits at a mitigation bank approved by USFWS and transplantation of the impacted shrubs to the bank, if feasible.

As described above, there are 9 blue elderberry shrubs in the riparian woodlands in the site, with 7 of the shrubs being along the south bank of the Old Calaveras River and 2 shrubs along the banks of Mormon Slough (Figure 5). There is also a shrub in the alcove of the old office building that will be demolished. The shrubs range from approximately 8 to 15 feet in height and all of the shrubs have multiple stems. While the blue elderberry shrubs may provide habitat for VELB, no boreholes indicative of valley elderberry longhorn beetle were observed on the stems of the shrubs.

The project would result in the removal of approximately 2.73 acres of riparian forest vegetation that contains 7 blue elderberry shrubs, as well as an individual

shrub in an urbanized area. With the exception of the western-most two blue elderberry shrubs along the bank of the Old Calaveras River, all of the blue elderberry shrubs in the site will be removed. VELB could be directly impacted by removal of mature elderberry shrubs.

Grading in close proximity to the two blue elderberry shrubs that will be retained (i.e., shrubs 2 and 3), could also result in changes in drainage patterns or generation of dust, indirectly impacting valley elderberry longhorn beetles by a reduction in habitat suitability. The grasslands adjacent to shrubs 2 and 3 have been graded in the past and are periodically disturbed by activities such as maintenance or staging.

OTHER SPECIAL-STATUS SPECIES: Beyond Swainson's hawk and tricolored blackbird, a few other special-status birds may fly over or forage in the area on occasion, but are not expected to nest or extensively utilize the habitats within the project site. For example, bank swallow may nest along other portions of Mormon Slough, the Old Calaveras River, or the Calaveras River, but the immediate project site does not provide suitable nesting habitat for this species. Yellow-breasted chat is not known from the area and there is no highly suitable nesting habitat for burrowing owl in the site.

The site does not provide roosting habit for pallid bat, which prefers rocky areas for roosting; this bat and other common bat species may fly over or forage in the site.

There are no potential breeding ponds in or near the site for California tiger salamander and also no suitable breeding ponds for western spadefoot. The Calaveras River, Old Calaveras River, and Mormon Slough in and near the site do not provide suitable habitat for giant garter snake, which does not occur in large rivers with introduced populations of large predatory fish.

There are no vernal pools or seasonal wetlands in the site for vernal pool branchiopods (i.e., fairy, tadpole, and Conservancy shrimp). Finally, monarch

butterfly would not be expected to occur in the site and no extensive areas of milkweed, in which monarch larvae rely, were observed in the site.

Critical Habitat

The site is not within designated critical habitat for California red-legged frog (USFWS, 2006a), federally listed vernal pool shrimp or plants (USFWS, 2005a), California tiger salamander (USFWS, 2005b), valley elderberry longhorn beetle (USFWS, 1980), or other federally listed terrestrial species (Appendix D).

Habitat Conservation Plans

The project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. The fish passage portion of the project is a required component of the recently adopted Calaveras Habitat Conservation Plan (Stockton East Water District & Fishbio, 2019), which is focused on fisheries resources.

The project is in San Joaquin County and has an opportunity to participate in the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) (SJCOG, 2000), which is focused on terrestrial biological resources. The SJMSCP involves payment of per-acre fees that are utilized by the San Joaquin Council of Governments (SJCOG) to preserve and manage conservation lands. The SJMSCP also authorizes take of 97 covered species and requires compliance with Incidental Take Minimization Measures (ITMMs) that are issued on a project-by-project basis. The SJMSCP is a voluntary plan, and is an optional mitigation program to reduce project impacts to a less-than-significant level.

Riparian Habitats

Riparian habitats, such as the riparian woodlands in the site, provide suitable habitat for numerous plant and wildlife species; some riparian corridors also support sensitive vegetation communities. Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, and Great Valley Valley Oak Riparian Forest (Holland, 1986) are sensitive vegetation communities mapped in the CNDDDB along riparian corridors. Although not mapped in the CNDDDB, approximately 3.09 acres of the site is comprised of riparian woodlands that may be best classified as Great Valley Valley Oak Riparian Forest vegetation.

The project will result in permanent impacts to a maximum of 2.73 acres of riparian woodland vegetation resulting from the conversion of riparian woodlands to project facilities (i.e., “project footprint”) as well as vegetation removal and grading in surrounding areas that is required to facilitate construction (Figure 7). Some of the vegetation within this 2.73 acres may remain following construction and some vegetation will likely re-establish in parts of this 2.73 acres following construction.

The project will also result in temporary construction impacts from staging in up to 0.06 acres of riparian woodland vegetation (Figure 8). Tree removal is not proposed in the staging areas, as the trees are primarily mature valley oaks with canopies 20 feet or more above ground level (see photographs in Appendix C). These areas are subject to routine disturbance associated with maintenance of the existing diversion facilities, with vehicles and equipment readily driving around under the tree canopies. Following construction, the riparian woodland vegetation and wildlife habitats in the staging areas will be comparable to those prior to construction.

Other Sensitive Vegetation Communities

Northern Hardpan Vernal Pool (Holland, 1986) is the only sensitive vegetation community mapped in the CNDDDB (2022) search area (Appendix B). The

CNDDDB contains a few records of Northern Hardpan Vernal Pool vegetation several miles south of the site near Farmington and many miles northwest of the site near Clements.

Valley Oak Woodland (Holland, 1986) is also a sensitive vegetation community mapped in the CNDDDB (2022). Although not mapped in the CNDDDB search area (Appendix B), approximately 4.36 acres of the site is comprised of valley oak woodland vegetation. The project will result in permanent impacts to a maximum of 2.30 acres of valley oak woodland resulting from the conversion of valley oak woodlands to project facilities as well as vegetation removal and grading in surrounding areas that is required to facilitate construction (Figure 7).

The project will also result in temporary construction impacts from staging in up to 1.80 acres of valley oak woodland vegetation (Figure 8). As described above, tree removal is not proposed in the staging areas. The trees in the staging areas are relatively large, with high canopies and ample room for equipment and personnel. As an example, the proposed west staging area is currently being used for staging for an erosion repair project along Mormon Slough just downstream of the Escalon-Bellota Road bridge (see photographs in Appendix C). While trimming of some low tree branches in the staging areas may be needed, the trees will not be removed. Following construction, the valley oak woodland vegetation in the staging areas will be comparable to that prior to construction.

Wildlife Movement Corridors

Riparian corridors, such as those in the project site, are often utilized for movement by terrestrial wildlife species such as mule (black-tail) deer, coyote, red fox (*Vulpes vulpes*), and bobcat (*Felis rufus*), as well as a variety of amphibians, reptiles, and fish. Following project construction, terrestrial habitats in the site will contain fewer large trees and less shrubby vegetation than under existing conditions. These post-construction terrestrial habitats will not impede wildlife movement and are expected to continue to be used for wildlife

movement, by species such as deer and coyote, despite being a bit more open.

Concurrent with a key project objective of improving upstream and downstream fish passage in Mormon Slough and the Calaveras River, the project will provide for enhanced movement of terrestrial wildlife species that utilize aquatic habitats on a periodic basis, such as turtles and frogs.

Operational Impacts

Operation of the project would involve modifications to the flow regimes in the Calaveras River, Old Calaveras River, and Mormon Slough. As described above, the project is expected to enhance movement of terrestrial wildlife species that utilize aquatic habitats on a periodic basis, as the barriers to species such as turtles and frogs that exist during some times of the year will be replaced by open water habitats. Project operations are not expected to impact more strictly terrestrial wildlife species, as changes in flows will not alter terrestrial habitats adjacent to the aquatic habitats in the site. The wildlife habitat functions and values in terrestrial habitats adjacent to the rivers and creeks in the site are expected to remain comparable to those under existing conditions.

V. AVOIDANCE, MINIMIZATION AND MITIGATION MEASURES

The following avoidance, minimization, and mitigation are recommended to reduce the potential for impacts to jurisdictional Waters of the U.S., special-status species, and potential or actual habitats of special-status species:

- Minimize impacts to potentially jurisdictional Waters of the U.S. and wetlands by restricting all work to the project footprint and adjacent temporary construction areas, as proposed. Secure permits from ACOE, CDFW, RWQCB, and CVFPB and implement all permit conditions and mitigation measures related to the protection of sensitive aquatic habitats

and species, including any conditions resulting from ACOE Section 7 consultations with USFWS and/or the NMFS, such as project scheduling and implementing appropriate construction Best Management Practices (BMPs).

- Minimize impacts to riparian woodland vegetation to the minimum needed to accomplish the project. If the conversion of riparian woodland vegetation is not offset by the environmental benefits of the project, compensation for permanent impacts to a maximum of 2.73 acres of riparian woodland vegetation could be accomplished by enhancing and preserving riparian woodlands at an off-site location in perpetuity. Alternately, compensation for permanent impacts to riparian woodland vegetation could be provided through participation in the SJMSCP.
- Minimize impacts to valley oak woodland vegetation to the minimum needed to accomplish the project. If the conversion of valley oak woodland vegetation is not offset by the environmental benefits of the project, compensation for permanent impacts to a maximum of 2.30 acres of valley oak woodland vegetation could be accomplished by enhancing and preserving valley oak woodlands at an off-site location in perpetuity. Alternately, compensation for permanent impacts to valley oak woodland vegetation could be provided through participation in the SJMSCP.
- To compensate for potential direct and indirect impacts to VELB and potential VELB habitat, provide compensatory mitigation according to the USFWS Framework. The project would result in the removal of approximately 2.73 acres of riparian forest vegetation that contains 7 blue elderberry shrubs, as well as an individual shrub in an urbanized area. Compensation could be provided via the purchase of 8.19 acres of credits (3:1 ratio) at a USFWS-approved mitigation bank, such as the French Camp Conservation Bank. Alternately, potential direct and indirect impacts to VELB and potential VELB habitat could be provided through participation in the SJMSCP.

- install protective fencing around the the two blue elderberry shrubs that will be retained shrubs prior to construction to minimize the potential for indirect impacts to VELB and potential VELB habitat.
- Conduct surveys for nesting Swainson's hawks within 0.25 miles of the site within 15 days prior to the commencement or resumption of construction each year between March 1 and August 31. The surveys should incorporate methodologies from CDFW's 1994 Staff Report regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California (CDFW, 1994) and the Swainson's Hawk Technical Advisory Committee (SHTAC) survey guidelines (SHTAC, 2000). If active Swainson's hawk nests are found, a biologist experienced with raptor behavior should prepare a take avoidance plan for review and approval by CDFW. Avoidance measures may include temporal restrictions on construction in close proximity to the nest, monitoring, or other measures. If construction in close proximity to a nest cannot be avoided, SEWD may elect to obtain take authorization pursuant to FGCC Section 2081. Alternately, potential direct and indirect impacts to nesting Swainson's hawks could be provided through participation in the SJMSCP.
- Conduct pre-construction surveys for western pond turtle and their nests prior to the commencement or resumption of construction each year during April 1 through October 31. This would involve a search for nests in uplands in the site. If nest sites are located, a 50-foot buffer area around the nest should be staked and work should be delayed until hatching is complete and the young have left the nest site. Alternately, potential direct and indirect impacts to western pond turtle and their nests could be provided through participation in the SJMSCP.
- If a western pond turtle is observed in the work area, allow it to move out of the area on its own. Alternately, western pond turtles could be relocated by a qualified and appropriately permitted biologist to a suitable

aquatic habitat outside of the work area.

- If possible, remove vegetation outside the avian nesting season (i.e., remove vegetation between September 1 and January 31) to avoid impacts to nesting birds. Conduct pre-construction surveys for nesting birds prior to the commencement or resumption of construction each year during February 1 through August 31. If active nests of common birds are found, work in the vicinity of the nest should be delayed until the young fledge.

VI. REFERENCES AND LITERATURE CONSULTED

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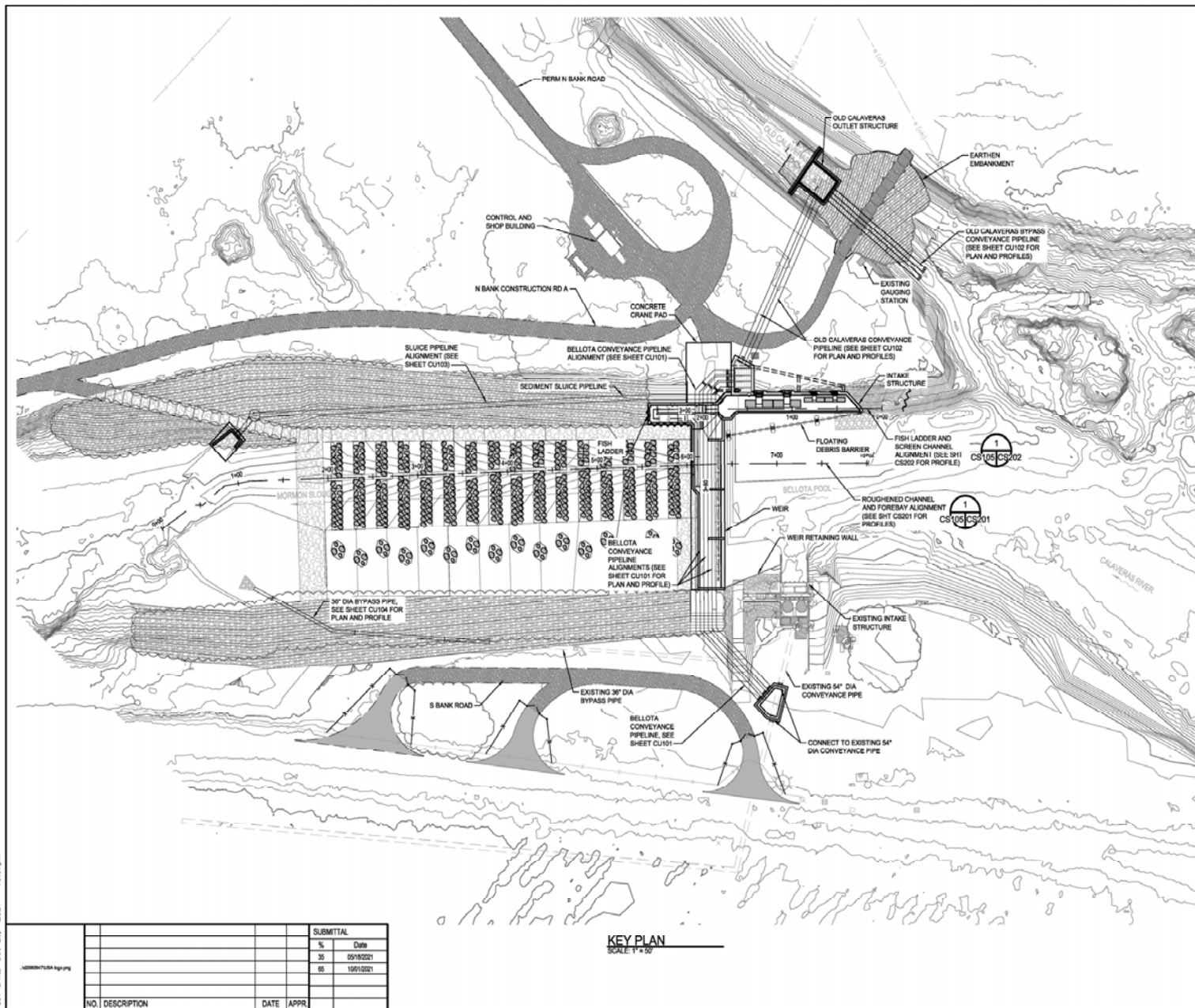
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Attachment A

Site Plan (Sheet CS105 of 90% Plans)

Environmental Impact Exhibit

FILE: S:\PROJECTS\2019-225 Bellota Weir Modification\CS105.dwg
 PLOT DATE: Dec 20, 2021 10:07pm



- GENERAL NOTES:**
1. FOR RIVER PLANS/ PROFILES/ DETAILS, SEE RI SHEETS.
 2. FOR PIPING PLANS/ PROFILES/ DETAILS, SEE CU SHEETS.

PROJECT: 2019-225 Bellota Weir Modification
 DATE: 12/20/21
 DRAWN BY: JLC
 CHECKED BY: MJH
 SUBMITTED BY: JLC



**STOCKTON EAST
 WATER DISTRICT**
 6767 EAST MAIN ST.
 STOCKTON, CA



BELLOTA WEIR MODIFICATION PROJECT
 24330 EAST S BAY AVENUE, CA 95226
 SAN JOAQUIN COUNTY, CA

SITE PLAN
 90% SUBMITTAL

DESIGN BY: JLT
 DRAWN BY: JLC
 CHECK BY: MJH
 SUBMITTED BY: JLC
 HORIZONTAL DATUM: CG85, ZONE 3
 VERTICAL DATUM: NAVD83
 DRAWING SCALE: VERT: N/A, HORZ: 1" = 50'
 ORIGINAL DRAWING SCALE: 0 36" 1"
 DATE: 10/01/21
 SHEET IDENTIFICATION: **CS105**
 SHEET 7 OF XX
 KSN PROJECT FILE NO.: 2432-0010



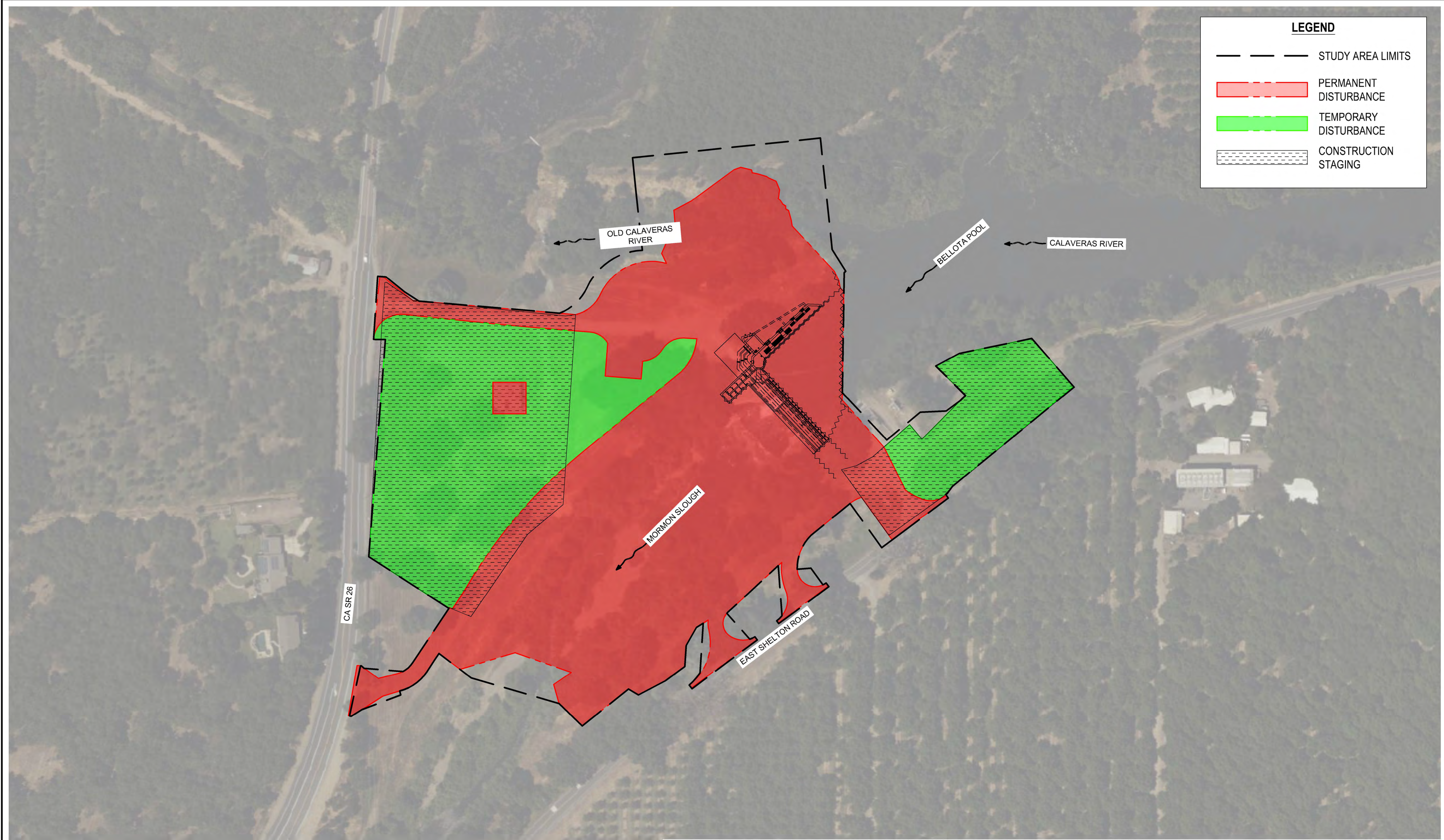
PRELIMINARY
 NOT FOR
 CONSTRUCTION



ECORP Consulting, Inc.
 ENVIRONMENTAL CONSULTANTS

Figure 2-4. Improvement Plans
 2019-225 Bellota Weir Modification Project

FILE SPEC: P:\2432_SEWD_Bellota_Weir_Fish_Ladder_Rep\0010_Fish_Ladder_Replacement\08_Civil\400_Plans\020_CAD\Exhibits\ENVIR-EXHB.dwg
PLOT DATE: Jul 19, 2022 1:23pm



LEGEND

| | |
|--------------|-----------------------|
| --- | STUDY AREA LIMITS |
| [Red Fill] | PERMANENT DISTURBANCE |
| [Green Fill] | TEMPORARY DISTURBANCE |
| [Hatched] | CONSTRUCTION STAGING |

811
Know what's below.
Call before you dig.

| | | | | | | |
|-----------------------|---|---|---|--|--|---|
| NORTH ORIENTATION | KJELDSEN SINNOCK NEUDECK inc. CIVIL ENGINEERS & LAND SURVEYORS www.ksninc.com | 711 N. Pershing Avenue Stockton, CA 95203 209-946-0268 1550 Harbor Blvd., Suite 212 West Sacramento, CA 95691 916-403-5900 | BELLOTA WEIR MODIFICATIONS PROJECT SAN JOAQUIN COUNTY, CA ENVIRONMENTAL IMPACT EXHIBIT SITE PLAN | | DRAWING SCALE 1" = 80' ORIGINAL DRAWING SCALE 0 1/2" 1" | EXHIBIT NO. A PAGE NO. 1 |
| | | | | | | |

Attachment B

CNDDB Summary Report and Exhibits & USFWS

IPaC Trust Report



Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad IS (Linden (3812111) OR Valley Springs SW (3812018) OR Wallace (3812028) OR Clements (3812121) OR Farmington (3712088) OR Peters (3712181))

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|--|--------------|----------------|--------------|-------------|------------|--------------------------------|
| <i>Agelaius tricolor</i> tricolored blackbird | ABPBXB0020 | None | Threatened | G1G2 | S1S2 | SSC |
| <i>Agrostis hendersonii</i> Henderson's bent grass | PMPOA040K0 | None | None | G2Q | S2 | 3.2 |
| <i>Ambystoma californiense pop. 1</i> California tiger salamander - central California DPS | AAAAA01181 | Threatened | Threatened | G2G3T3 | S3 | WL |
| <i>Andrena blennospermatis</i> Blennosperma vernal pool andrenid bee | IIHYM35030 | None | None | G2 | S2 | |
| <i>Andrena subapasta</i> An andrenid bee | IIHYM35210 | None | None | G1G2 | S1S2 | |
| <i>Antrozous pallidus</i> pallid bat | AMACC10010 | None | None | G4 | S3 | SSC |
| <i>Arctostaphylos myrtifolia</i> lone manzanita | PDERI04240 | Threatened | None | G1 | S1 | 1B.2 |
| <i>Athene cunicularia</i> burrowing owl | ABNSB10010 | None | None | G4 | S3 | SSC |
| <i>Branchinecta lynchi</i> vernal pool fairy shrimp | ICBRA03030 | Threatened | None | G3 | S3 | |
| <i>Branchinecta mesoallensis</i> midvalley fairy shrimp | ICBRA03150 | None | None | G2 | S2S3 | |
| <i>Buteo swainsoni</i> Swainson's hawk | ABNKC19070 | None | Threatened | G5 | S3 | |
| <i>Calycadenia hooveri</i> Hoover's calycadenia | PDAST1P040 | None | None | G2 | S2 | 1B.3 |
| <i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle | IICOL48011 | Threatened | None | G3T2T3 | S3 | |
| <i>Emys marmorata</i> western pond turtle | ARAAD02030 | None | None | G3G4 | S3 | SSC |
| <i>Eryngium pinnatisectum</i> Tuolumne button-celery | PDAP10Z0P0 | None | None | G2 | S2 | 1B.2 |
| <i>Eryngium racemosum</i> Delta button-celery | PDAP10Z0S0 | None | Endangered | G1 | S1 | 1B.1 |
| <i>Falco mexicanus</i> prairie falcon | ABNKD06090 | None | None | G5 | S4 | WL |
| <i>Horkelia parryi</i> Parry's horkelia | PDROS0W0C0 | None | None | G2 | S2 | 1B.2 |
| <i>Icteria virens</i> yellow-breasted chat | ABPBX24010 | None | None | G5 | S3 | SSC |

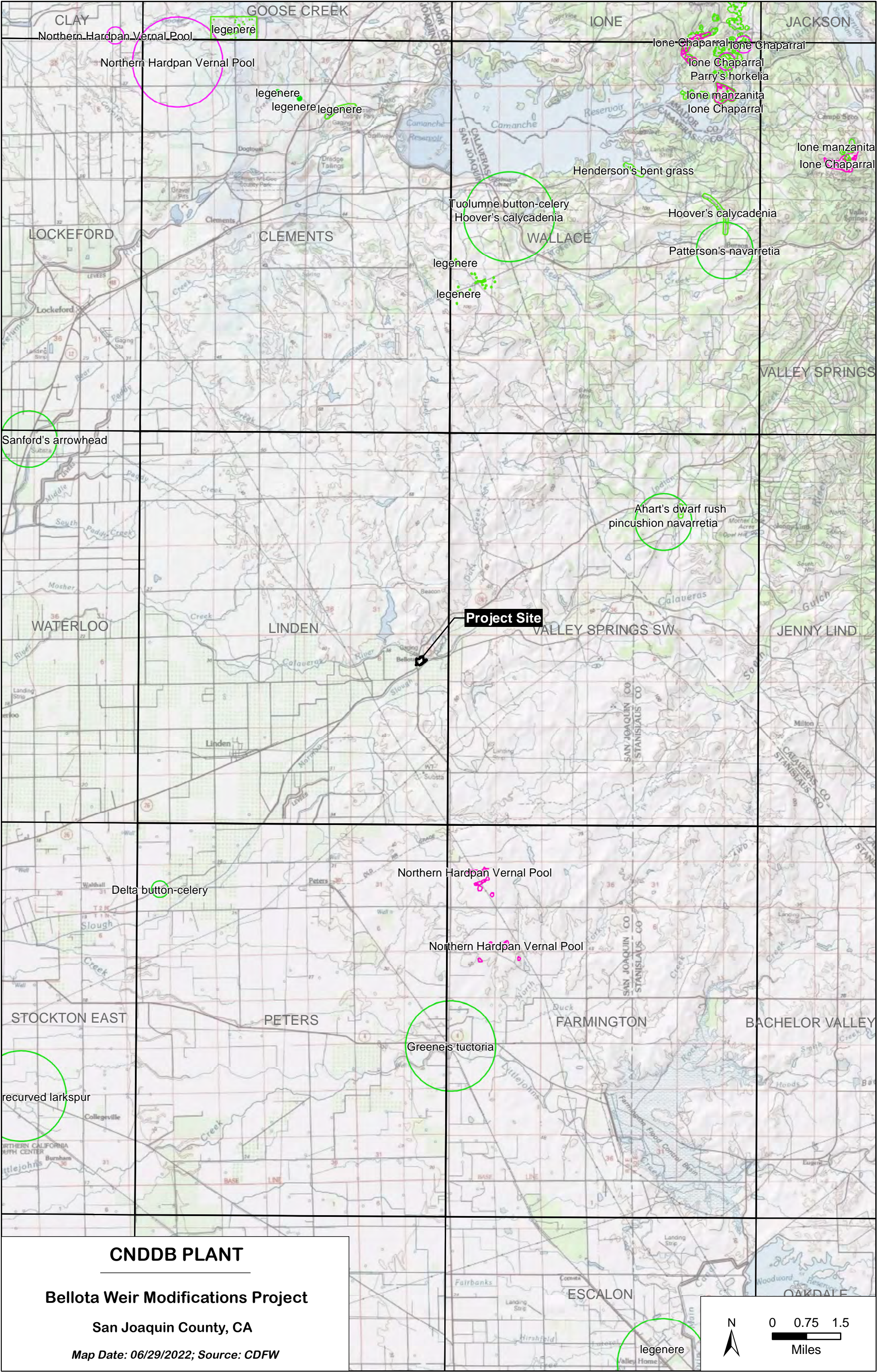


Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|--------------|----------------|--------------|-------------|------------|--------------------------------|
| <i>Ione Chaparral</i> Ione Chaparral | CTT37D00CA | None | None | G1 | S1.1 | |
| <i>Juncus leiospermus var. ahartii</i> Ahart's dwarf rush | PMJUN011L1 | None | None | G2T1 | S1 | 1B.2 |
| <i>Legenere limosa</i> legenere | PDCAM0C010 | None | None | G2 | S2 | 1B.1 |
| <i>Lepidurus packardi</i> vernal pool tadpole shrimp | ICBRA10010 | Endangered | None | G4 | S3S4 | |
| <i>Linderiella occidentalis</i> California linderiella | ICBRA06010 | None | None | G2G3 | S2S3 | |
| <i>Mylopharodon conocephalus</i> hardhead | AFCJB25010 | None | None | G3 | S3 | SSC |
| <i>Navarretia myersii ssp. myersii</i> pincushion navarretia | PDPLM0C0X1 | None | None | G2T2 | S2 | 1B.1 |
| <i>Navarretia paradoxiclara</i> Patterson's navarretia | PDPLM0C150 | None | None | G2 | S2 | 1B.3 |
| <i>Northern Hardpan Vernal Pool</i> Northern Hardpan Vernal Pool | CTT44110CA | None | None | G3 | S3.1 | |
| <i>Oncorhynchus mykiss irideus pop. 11</i> steelhead - Central Valley DPS | AFCHA0209K | Threatened | None | G5T2Q | S2 | |
| <i>Pandion haliaetus</i> osprey | ABNKC01010 | None | None | G5 | S4 | WL |
| <i>Riparia riparia</i> bank swallow | ABPAU08010 | None | Threatened | G5 | S2 | |
| <i>Spea hammondi</i> western spadefoot | AAABF02020 | None | None | G2G3 | S3 | SSC |
| <i>Thamnophis gigas</i> giant gartersnake | ARADB36150 | Threatened | Threatened | G2 | S2 | |
| <i>Tuctoria greenei</i> Greene's tuctoria | PMPOA6N010 | Endangered | Rare | G1 | S1 | 1B.1 |

Record Count: 34



IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

San Joaquin County, California



Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📅 (916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Reptiles

| NAME | STATUS |
|---|------------|
| Giant Garter Snake <i>Thamnophis gigas</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482 | Threatened |

Amphibians

| NAME | STATUS |
|---|------------|
| California Tiger Salamander <i>Ambystoma californiense</i> There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/2076 | Threatened |

Fishes

| NAME | STATUS |
|--|------------|
| Delta Smelt <i>Hypomesus transpacificus</i> Wherever found There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/321 | Threatened |

Insects

| NAME | STATUS |
|--|-----------|
| Monarch Butterfly <i>Danaus plexippus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743 | Candidate |

Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* Threatened
Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/7850>

Crustaceans

| NAME | STATUS |
|--|------------|
| <p>Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> Wherever found</p> <p>There is final critical habitat for this species. The location of the critical habitat is not available.</p> <p>https://ecos.fws.gov/ecp/species/8246</p> | Endangered |
| <p>Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> Wherever found</p> <p>There is final critical habitat for this species. The location of the critical habitat is not available.</p> <p>https://ecos.fws.gov/ecp/species/498</p> | Threatened |
| <p>Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> Wherever found</p> <p>There is final critical habitat for this species. The location of the critical habitat is not available.</p> <p>https://ecos.fws.gov/ecp/species/2246</p> | Endangered |

Flowering Plants

| NAME | STATUS |
|---|------------|
| <p>Fleshy Owl's-clover <i>Castilleja campestris</i> ssp. <i>succulenta</i> Wherever found</p> <p>There is final critical habitat for this species. The location of the critical habitat is not available.</p> <p>https://ecos.fws.gov/ecp/species/8095</p> | Threatened |

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A
BREEDING SEASON IS
INDICATED FOR A BIRD ON
YOUR LIST, THE BIRD MAY
BREED IN YOUR PROJECT AREA
SOMETIME WITHIN THE
TIMEFRAME SPECIFIED, WHICH
IS A VERY LIBERAL ESTIMATE OF
THE DATES INSIDE WHICH THE
BIRD BREEDS ACROSS ITS
ENTIRE RANGE. "BREEDS
ELSEWHERE" INDICATES THAT
THE BIRD DOES NOT LIKELY
BREED IN YOUR PROJECT
AREA.)

Bald Eagle *Haliaeetus leucocephalus*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Common Yellowthroat *Geothlypis trichas sinuosa*

Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/2084>

Nuttall's Woodpecker *Picoides nuttallii*

Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/9410>

Oak Titmouse *Baeolophus inornatus*

Breeds Mar 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9656>

Olive-sided Flycatcher *Contopus cooperi*

Breeds May 20 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3914>

Tricolored Blackbird *Agelaius tricolor*

Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3910>

Yellow-billed Magpie *Pica nuttalli*

Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9726>

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

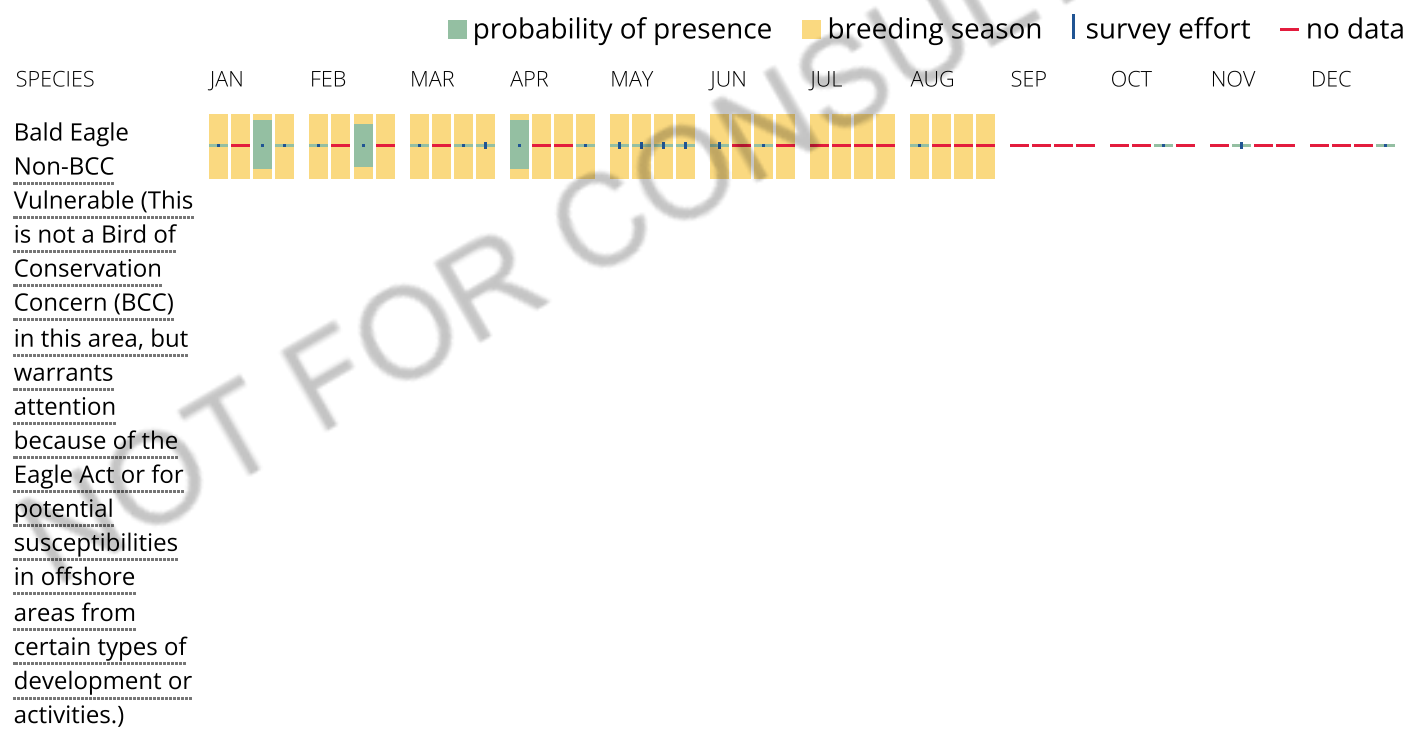
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Common
Yellowthroat
BCC - BCR (This
is a Bird of
Conservation
Concern (BCC)
only in
particular Bird
Conservation
Regions (BCRs)
in the
continental
USA)



Nuttall's
Woodpecker
BCC - BCR (This
is a Bird of
Conservation
Concern (BCC)
only in
particular Bird
Conservation
Regions (BCRs)
in the
continental
USA)

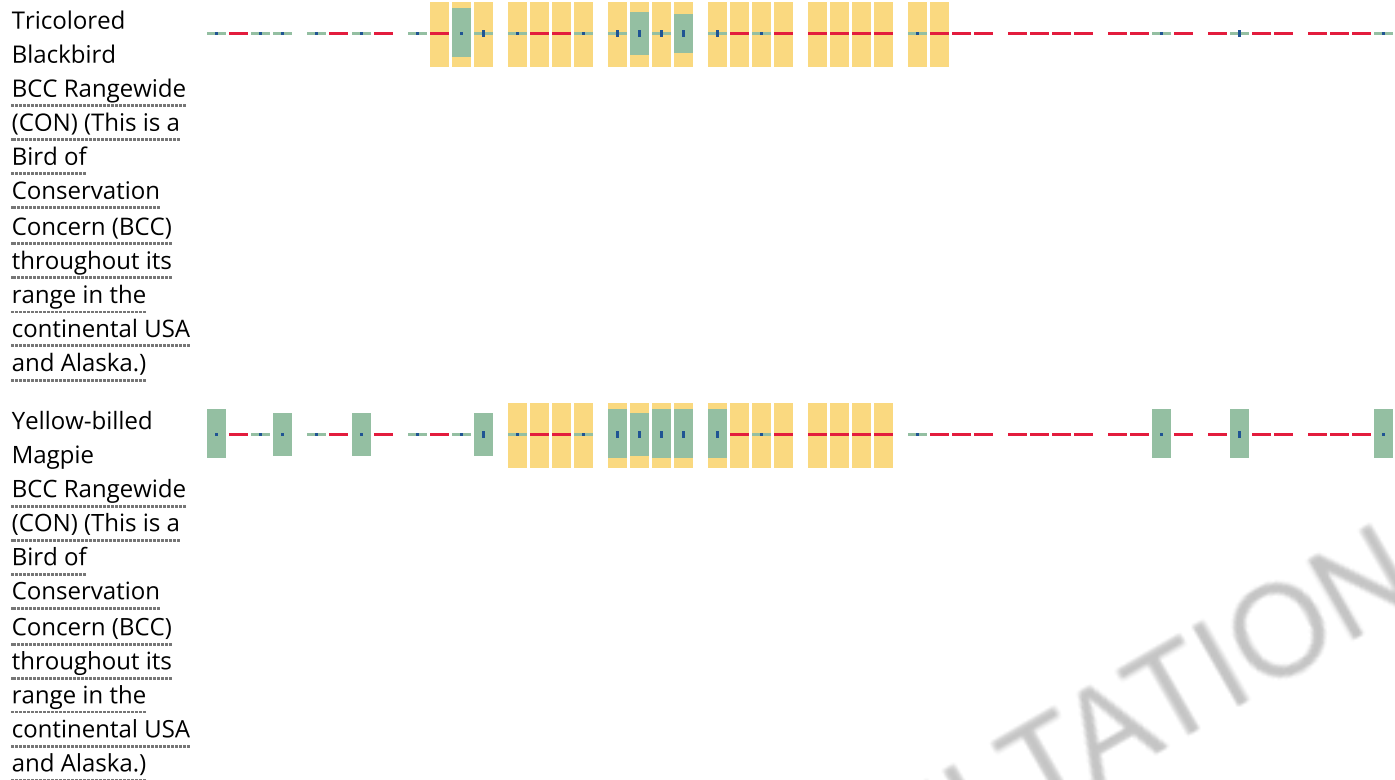


Oak Titmouse
BCC Rangewide
(CON) (This is a
Bird of
Conservation
Concern (BCC)
throughout its
range in the
continental USA
and Alaska.)



Olive-sided
Flycatcher
BCC Rangewide
(CON) (This is a
Bird of
Conservation
Concern (BCC)
throughout its
range in the
continental USA
and Alaska.)





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the [John H. Chafee Coastal Barrier Resources System](#) (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local [Ecological Services Field Office](#) or visit the [CBRA Consultations website](#). The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

THERE ARE NO KNOWN COASTAL BARRIERS AT THIS LOCATION.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the [official CBRS maps](#). The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: <https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation>

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

[Palustrine](#)

RIVERINE

[Riverine](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment C

Photographs



Valley oak woodland adjacent to the Bellota weir, looking southwest from just north of the weir; 03/20/20. No Swainson's hawks were observed flying over the site or nesting in trees in or near the site.



Ruderal grassland south of Mormon Slough, looking southwest; 03/20/20. This area will be used for construction staging.



Ruderal grassland, looking south from near the Old Calaveras River bridge on Highway 26; 03/20/20. The grasslands in the site are routinely mowed and/or disked.



Ruderal grassland and valley oak woodland south of Mormon Slough, looking southwest from the east edge of the site, near Shelton Road; 03/20/20.



Disturbed grassland and woodlands north of Mormon Slough, looking southwest from near the Old Calaveras River; 07/13/22. This area is being used for construction staging from an erosion repair project on Mormon Slough downstream of the site.



Piles of mulched trees from the nearby construction project, looking north along the site access road from Highway 26; 07/13/22.



Old Calaveras River, looking east from a control structure just west of the project site; 07/02/21. The banks of the Old Calaveras River are steep and the limit of Corps of Engineers jurisdiction is the ordinary high water mark.



Mormon Slough, looking upstream toward the Bellota weir; 01/06/22.



Mormon Slough, looking southwest along the north bank of the river; 07/02/21. The banks of Mormon Slough are steep and the limit of Corps of Engineers jurisdiction is the ordinary high water mark.



Bellota weir, looking west from the south bank of Mormon Slough; 03/20/20.



Elderberry Shrub 5 just south of the Old Calaveras River, looking west; 07/02/21. This is one of 7 blue elderberry shrubs in the site that will be removed.



Elderberry Shrub 1 in the alcove of the old office south of the Old Calaveras River, looking east; 07/13/22. This shrub is located in the north staging area and is one of three shrubs that will be removed when the building is demolished.



Irrigation intake on the south bank of the diversion pool, looking south; 03/20/20. There are numerous swallows nesting on the intake structure.



Close-up of swallow nests under the intake structure, looking south; 03/20/20.



Rookery approximately 600 feet upstream of the Bellota weir, looking north from the south bank of the Mormon Slough; 03/20/20. Egrets and great blue herons were observed nesting in this rookery .



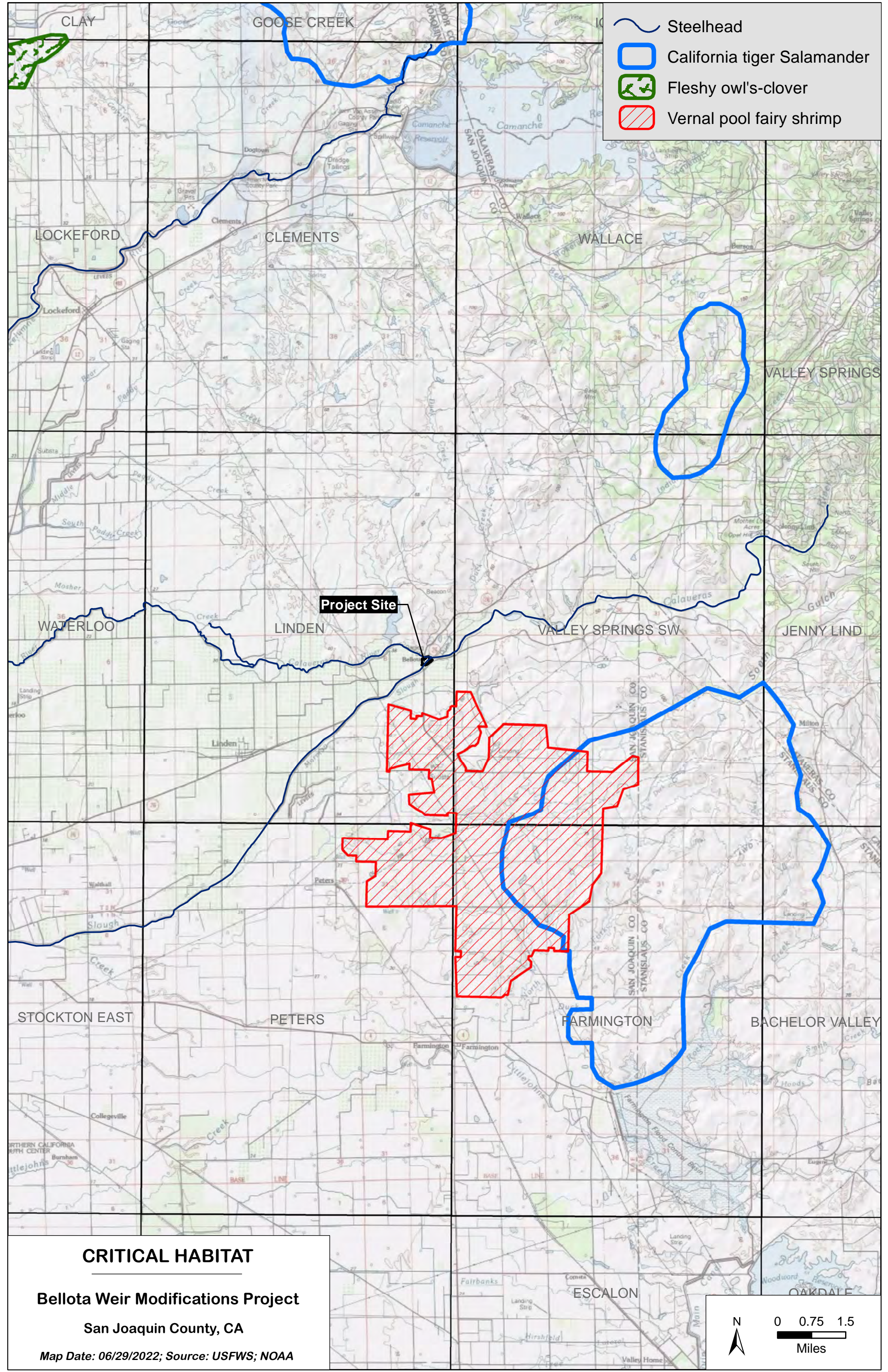
Close-up of nesting birds in the rookery, looking north from the south bank of Mormon Slough, across from the mouth of the Old Calaveras River; 03/20/20.



Osprey nest on top of a power pole approximately 600 feet northwest of the Bellota weir, looking northwest; 03/20/20.

Attachment D

Designated Critical Habitat



Biological Assessment of Potential Impacts of the Bellota Weir Modification Project on Fisheries Resources



Submitted To:
Stockton East Water District

Prepared By:



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Date Submitted
June 2022

Introduction

FISHBIO was contracted by Stockton East Water District (SEWD) to assess potential impacts of the Bellota Weir Modification Project on protected fish species within and near the project area. The Calaveras River, where the proposed project will occur, has been designated as critical habitat for Central Valley steelhead (*Oncorhynchus mykiss*). Various runs of Chinook salmon (*O. tshawytscha*) may also opportunistically utilize the Calaveras River for spawning; however, they are not believed to occur in sufficient numbers to support a viable population. Findings of potential impacts to both species, their critical habitat, and recommendations to avoid and mitigate project effects are presented below. This document is intended to supplement the CEQA document prepared by project partners (ECORP 2022) and the technical basis for Section 7 consultation(s) for fisheries.

Purpose and Need

The existing Bellota Weir facility on the Mormon Slough/Calaveras River is owned and operated by SEWD to provide water to urban and agricultural users. The Bellota Weir has been documented as a known impediment to fish passage since at least 2007 (DWR 2007) and has remained a priority project since this initial evaluation. The weir regulates the water surface elevation in the Calaveras River to allow for diversions for municipal and agricultural use. The Bellota Intake feeds a pipeline located at the weir that provides municipal and industrial flow year-round to SEWD's municipal water treatment plant and supplies irrigation water for agricultural users throughout the irrigation season (generally mid-April to mid-October).

The Old Calaveras Headworks (Headworks), located approximately 400 feet downstream of the Mormon Slough/Old Calaveras River divergence in parallel to the Bellota Intake, provides flow control and flood protection to downstream landowners on the Old Calaveras River during the non-irrigation season by routing flood waters through Mormon Slough, provides irrigation flows during the irrigation season, and provides groundwater recharge year-round. The Calaveras River has naturally seasonal hydrology and periodically disconnects from the mainstem San Joaquin River, which occurred both prior to and after construction of New Hogan Dam.

The current configuration of the Bellota facilities (Weir, Intake and Headworks) limits fish passage during a variety of stream flow conditions. During infrequent high flow events (when flows actively spill over the existing Bellota Weir or the fish ladder is installed) passage may occur, but not frequently enough or of sufficient duration to provide reliable opportunity for volitional passage of native salmonids. It should be noted that Mormon Slough, the channel downstream of the Bellota Weir, is the primary migratory corridor for salmonids. While improvements at Headworks are designed to reduce entrainment issues to the Old Calaveras, upstream migration issues for salmonids are not anticipated to be an issue due to downstream operations.

Continued operation of the Bellota Weir, Bellota Intake, and Old Calaveras River Headworks diversion is guided by the Calaveras Habitat Conservation Plan (CHCP; National Oceanic and Atmospheric Administration [NOAA] 2020). The CHCP provides operational criteria to support the biological goals of maintaining a viable population of threatened California Central Valley steelhead within the CHCP boundaries and maintaining adequate habitat conditions upstream of Bellota for fall-, late fall-, spring-, or winter-run Chinook salmon that may opportunistically migrate into the conservation area. While the CHCP includes actions to support the various runs of Chinook salmon when resources are available (e.g., designed fisheries flow when surplus water in reservoir prior to December 15th to get to flood control), conditions are not expected to maintain self-sustaining runs.

The CHCP allows SEWD to comply with the Endangered Species Act (ESA), protecting and managing fishery resources and habitat while maintaining reliable water delivery to its constituents. Following NOAA Fisheries approval on August 11, 2020, SEWD is authorized for a 50-year Incidental Take Permit (ITP #23264), for Endangered Species Act listed species under NOAA Fisheries authority.

The CHCP requires that the Bellota Weir, Bellota Intake, and Calaveras Headworks be upgraded or replaced. Specifically, the CHCP includes the following conservation targets:

FP1 and AE1: Avoid migration delays and blockage, and entrainment within the Old Calaveras River Channel by constructing a non-entraining barrier at the Old Calaveras River Headworks Facility and at the downstream end of the channel near the confluence with the [Stockton Diverting Canal] within the first ten years of the ITP.

FP2/AE3: Construct and implement a combined crest gate/fishway/fish screen at the Bellota [Intake] Diversion Facility to improve [salmonid] passage into/out of the 18-mile spawning and rearing reach between Bellota and New Hogan Dam and to prevent fish entrainment; target completion within first five years, but no later than 10 years of [issuance of] the ITP.

Project Description

The proposed project would generate multiple biological benefits and address a priority item for both the CDFW 2017 Fish Passage List (CDFW 2017) and the 2019 Priority Water Diversions for Screening (CDFW 2019). Completion of the project would provide protection for threatened Central Valley steelhead during outmigration and will allow for improved adult access to suitable spawning and rearing habitat upstream of the project area.

Based on the CHCP targets summarized above and SEWD's water supply needs, the three primary Project objectives are to:

- Improve fish passage by designing and constructing a new crest gate dam, fishway, and fish screens that includes passage for *O. mykiss* and opportunistic migration for fall-, late fall-, spring-, or winter-run Chinook salmon;
- Reduce fish entrainment by constructing a new non-entraining fish barrier at the Old Calaveras River and new surface water intake with fish screens; and,
- Provide more reliable water delivery through weir and intake improvements.

The proposed major Project components are shown on Figure 1 and include the following.

- Remove the existing Bellota Weir and construct a concrete dam with a series of weir gates designed to modulate forebay pool elevations based on operational needs.
- Improve sediment conveyance by including sluicing functions in the forebay, intake manifold, and screen channel.
- Provide reliable fish passage using a roughened channel combined with a fishway utilizing both vertical slot, pool, and weir techniques to accommodate the full range of flows and river stages at the site.
- Provide reliable fish screening, both for the Bellota Intake and the Old Calaveras River, to prevent fish entrainment.
- Provide a non-entraining fish barrier to the Old Calaveras River using an earthen embankment.

Removal of the existing Bellota Weir, in combination with the above components, would provide more reliable water delivery while improving passage of both juvenile and adult fish, and reduce fish entrainment at the facilities. As there are several other improvements planned as part of the proposed project, further descriptions of each individual component are provided in greater detail in ECORP 2022.

Construction would occur in five primary phases following a general sequence that optimizes constructability, cost effectiveness, environmental impact, and operational continuity. The current phasing strategy could be completed within approximately three years but is designed so construction phases could be delayed by several years if necessary to secure funding between phases. The construction phases are organized to provide full, complete elements that are functional even if future phases are delayed. It should be noted that impacts to fisheries resources may occur during construction, impacts will not occur between construction phases. To the contrary, each completed construction phase with the exception of Phase 1A are expected to address existing impacts to fish passage and provide for improved passage conditions. Potential impacts during each construction phase and incremental benefits associated with the completion of each construction phase are summarized in Table 1 and discussed in greater detail in the following sections describing each construction phase.

While a construction sequence has been identified for each construction phase, certain project elements may be constructed simultaneously. These are not identified in the

discussion below and would be at the contractor's discretion. Sheet pile wall installations, removals, and manipulations should remain as directed or thought through carefully, as in many cases the sheet pile walls are acting as temporary flashboards to provide irrigation water during irrigation season and must be cut following irrigation season to install remaining project elements and provide fish passage. The proposed construction phasing is presented in greater detail in ECORP 2022.

Prior to any mobilization of construction equipment and supplies, construction limits and installation of protections (i.e., temporary construction fencing) for any identified onsite Environmentally Sensitive Areas (ESAs) would be established. Following establishment of environmental site controls, construction equipment and supplies would mobilize to the site. Depending on the phase, expected construction equipment could include but is not limited to graders, loaders/backhoes, excavators, vibratory rollers/compactors, pickup trucks, drill rigs, truck mounted cranes, concrete delivery trucks, water trucks, hydro-seeding trucks and various generators, hand equipment and potentially a temporary construction trailer for onsite construction administration by the contractor. Required material deliveries could include, but would not be limited to, concrete, rebar, steel, asphalt, aggregate base, lumber and specialized prefabricated equipment such as pumps, screens and electronic control boxes. Construction equipment and materials would be trucked to the Project site as needed and stored in staging areas when not in use. Following the pre-construction tasks, phased construction would proceed as described in ECORP 2022.

Table 1. Summary of construction phasing, location, potential work window, elements, potential impacts and potential benefits to fisheries resources.

| Phase | Location | Potential Work Window | Construction Elements | Construction Related Impacts to Fisheries Resources | Benefits to Fisheries Resources |
|----------|---------------------|-----------------------|--|--|--|
| Phase 1A | Upland | Year-Round | Installation of protective elements; demo existing upland structures for staging; creation of temporary roads on site. | N/A | N/A |
| Phase 1B | Upland and instream | Year-Round | Install bypass for construction, sheet pile for fish ladder construction, and temporary sluice pipeline; access road construction; demolish existing weir. | Dewatering will require fish rescue/salvage; migration delays due to limited passage; potential harm due to pile driving effects. | Permanent fish ladder improves fish passage through Bellota Weir. |
| Phase 1C | Instream | Year-Round | Grade new weir forebay, roughened channel, and weir boulder bands; excavate riverbed across channel to accommodate new WSP; install new weir and mechanisms for Obermeyer weir gate. | Dewatering will require fish rescue/salvage; migration delays due to fish passage limitation | Revised grade at weir and roughened channel improves fish passage and provides more natural habitat downstream of weir. |
| Phase 1D | Upland and instream | Year-Round | Install debris booms and permanent sluiceway pipe; remove dewatering devices and sheet piles required by phase one. | Dewatering will require fish rescue/salvage; migration delays due to fish passage limitation. | Removal of construction materials allows full utilization of fish passage improvements. |
| Phase 2 | Upland and instream | Non-irrigation season | Install dewatering system and remainder of Bellota conveyance; construct distribution structure; finalize permanent fish ladder; connect sluiceway to fish ladder forebay; construct fish ladder exit; complete demolition of existing structures and complete construction of control and shop buildings; complete electrical work. | Dewatering will require fish rescue/salvage, migration delays due to fish passage limitation until completion of fish ladder. | Finishing permanent fish ladder will improve fish passage through Bellota and allow for fish passage across a wider range of flows during remaining construction phases. |
| Phase 3 | Upland and instream | Irrigation season | Erect Bellota bulkhead and stoplogs; construct cofferdam at the Calaveras outlet structure to isolate Old Cal conveyance pipeline; install new Obermeyer weirs and associated equipment. | Dewatering will require fish rescue/salvage; migration delays due to fish passage limitation until completion of fish ladder; potential direct harm due to pile driving effects. | Improved weir with Obermeyer gates and roughened channel will accommodate fish passage at a wider range of flows. Improvements at Headworks will reduce entrainment risk of fishes into Old Calaveras. |

| | | | | | |
|---------|---------------------|-----------------------|--|---|---|
| Phase 4 | Upland and instream | Non-irrigation season | Install intake structure and Old Cal conveyance pipeline from new intake to Old Cal; Install pumping systems; WSP to south side diversion structure; finish grading in areas above OHWM. | Dewatering of areas will require fish rescue/salvage; migration delays due to fish passage limitation until completion of fish ladder. | Screening improvements at intake facilities will reduce the risk of entrainment of fishes. |
| Phase 5 | Upland and instream | Irrigation season | Install cofferdams and dewatering system; construct temporary water supply system to Old Cal; construct new concrete Calaveras outlet structure; earthen fill levee w/ seepage controls. | Dewatering of areas will require fish rescue/salvage; migration delays due to fish passage limitation until completion of fish ladder; potential direct harm due to pile driving effects. | Screening improvements at intake facilities will reduce the risk of entrainment of fishes. Improvements at Old Calaveras Headworks will reduce entrainment risk of fishes into Old Calaveras. |

Phase 1 Construction

The following would be completed during construction of Phase 1A:

- Install landside erosion and sediment controls, including silt fencing and stabilized construction entrances, and place concrete washouts.
- Modify existing fencing, gates, and driveways and construct new entrances adjacent to State Route 26 and East Shelton Road.
- Identify existing features (e.g., archeologic, landscape, protected plants species, etc.) to be protected in place and demarcate them to be protected during construction as appropriate.
- Demolish the existing building in the construction staging area on the north side of the Project.
- Prepare and secure the contractor staging areas on the north and south sides of the Project.
- Construct the temporary roads for construction vehicle access, including the North Bank Construction Road and the South Bank Construction Road.
- Construct the permanent access roads, including the Permanent North Bank Road and the Permanent South Bank Road. These roads will be restored for permanent access prior to closeout of construction.

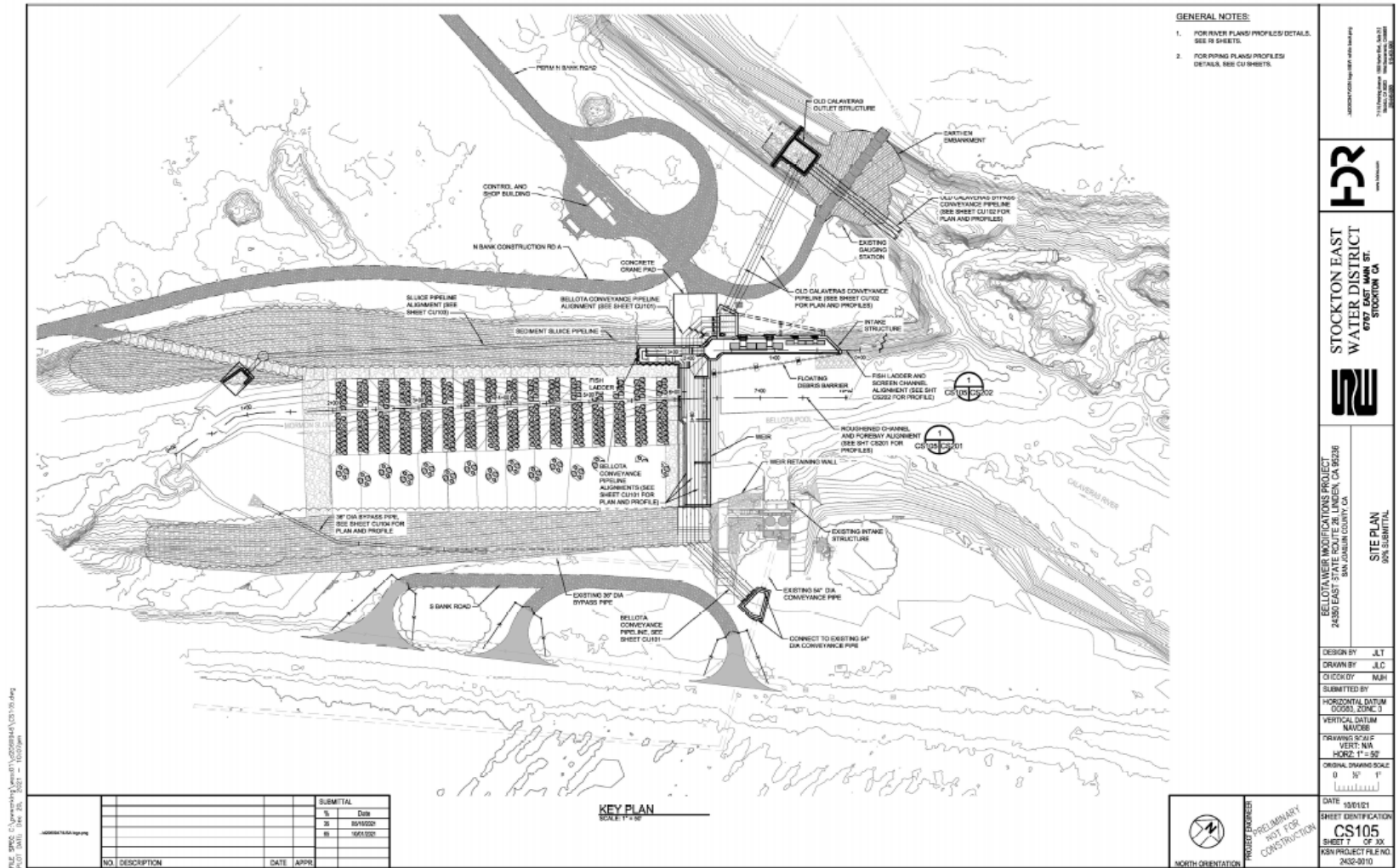


Figure 1. Project components and overall layout of the Bellota Weir Modification Project

The following activities would be completed during construction Phase 1B:

- Extend the existing 36-inch water bypass system downstream of the roughened channel and confirm functionality of the bypass to convey river flow during construction. A Rock Slope Protection (RSP) apron would be constructed for energy dissipation at the bypass outlet.
- Construct access road along right bank adjacent to the roughened channel, including the temporary access road adjacent to the existing north ramp of the weir.
- Install sheet pile wall from the downstream end of the future new fish ladder upstream to the tie-in to right bank 127 feet upstream of the future new intake structure.
- Install the new 54-inch Reinforced Concrete Pipe (RCP) sluice pipeline extending through sheet pile wall S3-B with a water control gate mounted to the wall for passage of flow during construction. Best management practices would be utilized at the inlet and the associated RSP apron would be constructed at the outlet, located downstream of the access road.
- Install sheet pile walls to the tip elevations as shown on the drawings and finish top at elevation 127 feet. This should occur prior to the irrigation season so that the WSE in the Bellota Pool provides the appropriate irrigation season flows to the Water Treatment Plant (WTP).
- Raise Bellota Pool to elevation 121.44 feet.
- Regulate bypass flows using both bypass pipelines to maintain pool elevation 121.44 feet.
- Install temporary dewatering sumps to control river seepage in construction work areas.
- Remove and salvage two Denil fish ladders.
- Demolish existing weir.
- Remove existing riprap and salvage any rock meeting project specifications.

The following would be completed during construction Phase 1C:

- Grade new weir forebay to finish elevations as shown on the drawings included in ECORP 2022.
- Excavate the riverbed to approximate elevation 104 feet across the entire river channel within the footprint of the weir to accommodate the three 54-inch WSP Bellota WSPs.
- Install sheet pile wall S1 to the tip elevations as shown on the sheet CS108 (ECORP 2022) with finish top elevation 115.5 feet.
- Install the 4 debris boom dolphin piles, and 78 pipe piles for the new weir footing, and 2 pipe piles for a small portion of fish ladder footing (as shown on construction plan set sheets CS108 and SB104; ECORP 2022).
- Install cross bracing on pipe piles to support the three 54-inch WSPs at the specified elevations across the river channel.

- Install three 54-inch pipelines with blind flange caps that extend beyond the weir footprint.
- Excavate roughened channel to design elevations (shown on sheet RI201 in ECORP 2022).
- Stockpile excavated spoils for future use.
- Backfill new weir footprint with flowable fill around the three 54-inch pipelines to elevation 109.5 feet.
- Install the weir slab, columns forms, and rebar including portion of fish ladder wall and slab.
- Install necessary mechanical conveyance lines for Obermeyer weir gate from mechanical building across weir structure.
- Pour weir slab, columns, and walls.
- Strip all formworks.
- Backfill roughened channel with specified riverbed materials.
- Finish-grade roughened channel and associated weir boulder bands.

The following would be completed during construction Phase 1D:

- Install debris boom components.
- Remove temporary portion of 54-inch sluice pipe and install per final 54-inch pipe alignment. Mount temporary slide gate on sheet pile wall S-3B.
- Remove temporary access road (east ramp).
- Install sheet pile wall S-3A.
- Install riverbank armoring.
- Lower Bellota Pool to elevation 115.44 feet.
- Remove in-river dewatering systems.
- Remove sheet pile wall S2.

Phase 2 Construction

Construction of Phase 2 would occur during the non-irrigation season, outside of the in-water work window. Fish passage throughout this phase would be provided using the roughened channel. Construction of this phase would require approximately six months and commence as early as fall 2023. Most of the work features in this phase would be isolated from the river with sheet pile walls S-3A and S-3B.

The following would be completed during Phase 2 construction:

- Install dewatering system to control potential seepage flows from the river and high groundwater.
- Install the remainder of the Bellota conveyance 54-inch pipelines on the north bank to the water distribution structure.
- Construct the distribution structure.

- Complete construction of the concrete fish ladder structure.
- Connect the sluice pipeline into the concrete fish ladder forebay structure.
- Construct temporary fish ladder exit and temporary wall in the fish ladder structure to provide fish passage during the next irrigation season.
- Demolish existing buildings on the site.
- Complete control and shop building including all associated equipment and controls.
- All electrical work would be complete after this phase.

Phase 3 Construction

Phase 3 construction would take place during the irrigation season, during the in-water work window. Stream diversion would be provided through the existing 36-inch bypass and if necessary, the newly constructed 54-inch diameter sluiceway. Fish passage would be provided using the roughened channel and fish ladder, with a temporary exit. Construction of this phase would require approximately six months and commence as early as spring 2024.

The following would be completed during Phase 3 construction:

- Erect removable Bellota bulkhead piers and stoplogs across entire weir.
- Construct temporary coffer dam at future Calaveras outlet structure to isolate the Old Calaveras conveyance pipeline installation.
- Raise the Bellota Pool to elevation 121.44 feet prior to the beginning of irrigation season so that the WSE in the Bellota Pool provides the appropriate irrigation season flows to the WTP.
- Use the 36-inch existing bypass pipe and fish ladder to provide bypass flows to Mormon Slough.
- Install new Obermeyer weirs and associated equipment.

Phase 4 Construction

Phase 4 construction would occur during the non-irrigation season, outside of the in-water work window. Fish passage would be provided using the roughened channel. Construction of this sequence would require approximately six months and commence as early as fall 2024.

The following would be completed during Phase 4 construction:

- Construct the necessary dewatering system to control both river and groundwater seepage.
- Install the intake structure, connecting it to the previously constructed fish ladder and distribution structure.

- Install dual RCP 54-inch Old Calaveras conveyance pipelines from new intake structure to the Old Calaveras River.
- Install concrete crane pad.
- Install pumping systems and complete startup and testing of various equipment.
- Remove/abandon portion of the 36-inch bypass where in conflict with the Bellota 54-inch Water Supply Pipeline (WSP) conveyance pipelines.
- Install the three 54-inch WSPs from the weir to the south side diversion structure.
- Complete 54-inch RCP main line connection and extension to the new 54-inch steel pipe.
- Cut sheet pile wall S3 down to final elevation as shown on sheet SB502, Detail 1.
- Finish site grading and final features above ordinary high water.

Phase 5 Construction

Phase 5 construction would occur during the irrigation season, during the in-water work window. No stream diversion would be needed. The work would require approximately 4 months and commence as early as spring 2025.

The following would be completed during Phase 5 construction:

- Install temporary coffer dams on either side of the earthen fill and in front of bank armoring adjacent to the new intake.
- Construct the necessary dewatering system to control both river and groundwater seepage.
- Construct temporary water supply system utilizing the new Calaveras 54-inch conveyance pipelines to Old Calaveras River.
- Construct the new concrete Calaveras outlet structure.
- Construct earthen fill levee with appropriate seepage controls.
- Install Bellota Pool right bank armoring.
- Complete all the necessary startup operational controls to operate the intake facility as intended.

Across all phases, in-water work will be limited whenever possible. In the event in-water work is required, sheet piles will be used to dewater the work area to exclude fisheries resources from the work area.

Bellota Facilities Operations After Improvements

Non-Irrigation Season

During the non-irrigation season, the weir gates will be lowered to elevation 115.44 ft. All other gates in the system will be closed except for two fish screen gates and the open/close SEWD water supply gate delivering water to the WTP. The modulating SEWD water supply gate will be closed while the system is primed. Once the water surface elevation (WSE) in the forebay is at least 115.44 ft, the modulating SEWD water supply gate will be opened to divert 46 cfs to the WTP. The weir gate in Bay 1 will then be lowered to elevation 114.5 feet to allow fish passage through the roughened channel notch. If the WSE in the forebay is 115.44 feet or greater, the modulating Calaveras River water supply gate will be opened to provide 15 cfs to the Old Calaveras River. The remaining will flow down Mormon Slough.

Normal Operations during the Irrigation Season

During the irrigation season, the weir gates will be raised to elevation 121.44 ft. All other gates in the system will be closed except for two fish screen gates mentioned above, and the open/close SEWD water supply gates delivering water to the WTP. The modulating SEWD water supply gate will be closed while the system is primed. Once the WSE in the forebay is at least 121.44 ft, the modulating SEWD water supply gate will be opened to divert 70 cfs to the WTP, maintaining the forebay elevation. After this, the fish ladder gate will be opened to divert 20 cfs down the fish ladder to accommodate fish passage. If the WSE in the forebay is 121.44 ft or greater, the modulating Calaveras River water supply gates will be opened to provide 150 cfs to the Old Calaveras River. Maintaining the 121.44 ft forebay elevation, the bypass flow gate will then be opened to divert 50 cfs down Mormon Slough. With additional flow, the Obermeyer weir gate in Bay 1 will be lowered to elevation 120.44 ft to send more flow down Mormon Slough.

High Flow Conditions

Periods of high flow, turbidity, sediment, and debris movement are anticipated to occur within the irrigation season. Conditions that may diminish the effectiveness of the surface water diversion may occur once out of every five to ten years when large-magnitude discharge events mobilize large amounts of buoyant and semi-buoyant debris in the water column. The proposed design incorporates several measures to mitigate these conditions, but the actual performance and resilience of the intake facility during these periods will be relatively uncertain until several years after operation of the facility begins.

The screen and intake design is configured to protect the fish screens during high debris and bedload movement. Raising or lowering the screens during storm events is not anticipated. The debris boom is intended to exclude large debris from entering the screen bay while the bypass maintains sweeping velocities across the screen to convey buoyant

and semi-buoyant debris downstream. Fine sediments in the screened intake manifold will be addressed with a water jet sediment removal system to keep the fine sediment in suspension. Sediment accumulation in the intake manifold and/or distribution structure will be addressed by a 12-inch-diameter sluice pipe connected to the 54-inch diameter sluicing pipeline.

High flow events may be taken advantage of by using the higher velocities to sluice accumulated debris or sediment.

Periodic Sluicing through Sluice Pipelines

Sluicing through the piped sluiceway will occur as needed to flush out material. Bedload and debris will be moved from upstream of the roughened channel to downstream of the facility.

This sluicing strategy will maintain an unimpeded hydraulic pathway from the forebay to the intake screens by clearing any bedload or debris that has accumulated upstream of the weir near the intake, as well as in the screenings channel. Further, the sluiceway can be used strategically to bypass the sediment around the weir crest and roughened channel to increase the magnitude and frequency of sediment movement through the reach. The operating rule curves and operating strategy will be developed further as the design progresses.

The sluicing pipeline operational strategy will be opportunistic in nature and focus on those river flow events that provide the highest velocity and shear. This strategy will be developed to maximize the anticipated capacity of sediment transport and minimize the accumulation of sediment, bedload, and debris near and in front of the trashrack inlet to the fish ladder.

Infrastructure Maintenance Activities After Improvements

Intake Screen Maintenance

Occasional maintenance may be necessary to remove large debris from screens or sluiceway, and check or perform minor repairs on screens. Cleaning of the screens will occur largely without human interaction via an automated system during normal operating periods. Occasional maintenance may be necessary for the automated debris rake system as well to ensure all systems are running properly. Higher levels of effort and attention to the fish screens may be required during periods of higher flows and high diversion demand that may periodically overlap. Sluicing of the area in front of and behind the fish screens is an operation that may be initiated manually but is carried out via push-button controls. Removal of sediment within the intake is expected to occur as frequently as required for the existing intake.

Consolidated Intake Maintenance (Instream Structures)

Most maintenance actions related to the new intake will occur within the new infrastructure and therefore isolated from the river channel. Following a large flood event, however, minor replacement of armoring adjacent to the new intake structure or removal of debris from the sluiceway exit may be necessary.

To address maintenance needs, SEWD anticipates most repairs will be accomplished using an excavator positioned on the access road along the north bank of the Mormon Slough, or from the bank. In-water work may be necessary.

It should be noted that in-water maintenance activities are currently covered by a Routine Maintenance Agreement with CDFW (RMA #1600-2018-0106-R2).

Sluiceway

The 54-inch-diameter sluiceway will provide sufficient flows to remove accumulated bedload in the forebay or intake structure. During forebay sluicing, the water level should be lowered enough to induce mobilization of sediment. The same principle applies to sluicing the intake structure.

Roughened Channel Fishway

The roughened channel fishway and crest are designed to withstand flows up to and including the 100-year flow (12,690 cfs) with some anticipated limited damage. Project failure at this site is defined as the inability to effectively pass fish through the reach or provide a reliable water supply to meet irrigation demands. The structural integrity of the weir crest and functional stability of the roughened channel should not be compromised during or following any given flow event up to the 100-year flow. Despite this, annual maintenance activities in the roughened channel fishway may be required to remove large debris if such debris is interfering with low flow conditions. Large debris removal will likely be accomplished using an excavator with an extension arm operating from the access road.

Although the design emphasizes stability, higher flow events may cause unanticipated scour and erosion altering the roughened channel crest and/or bed configuration requiring maintenance or repair activities. Repair activities may include filling eroded areas with a designed rock matrix like the original design or resetting specific large rocks at the crest or mid-fish channel to reestablish the indented hydraulic conditions. In-water activities required to maintain intended operations in the same footprint of the original facility are assumed to fall under maintenance exemptions. Larger scale repairs may require review and individual permits approved through multiple government agencies on a case-by-case basis.

Annual Maintenance

Large debris removal will be accomplished using an excavator with an extension arm operating atop the riprap wall of the sluiceway; no equipment will enter the channel except for the bucket arm. Plant removal will also likely be required during annual maintenance. Maintenance periods would occur on an opportunistic basis, when low flow periods downstream of the weir occur, typically during the irrigation season and in-water work window. These low flow periods may occur, but not necessarily within the current anticipated migration window. The annual level of effort associated with maintenance is anticipated to be zero to eight days.

Infrequent Maintenance

Although the design emphasizes stability, higher flow events may scour and erode the streambed and alter the roughened channel crest and/or bed configuration to a level requiring maintenance or repair activities. Larger scale repairs will possibly require coordination with the CDFW, NMFS, and USACE for review and approval. Infrequent repair activities may include filling eroded areas with a designed rock matrix like the original design or resetting specific large rocks at the crest or mid-fish channel to reestablish the indented hydraulic conditions. In-water activities required to maintain intended operations in the same footprint of the original facility are assumed to fall under maintenance exemptions for several permits (e.g., Hydraulic Permit Application and Clean Water Act 404/401). If such activities cannot be completed solely from the access road along the north bank or in the dry during low flow periods, an approach using a cofferdam and dewatering, including protocols for fish salvage, will be implemented as necessary. Fish rescues will be conducted as described in the CHCP.

Maintenance periods would occur on an opportunistic basis, when low flow periods downstream of the weir occur, typically during the irrigation season. These low flow periods may occur, but not necessarily within the current anticipated migration window. The general level of effort for maintenance events may be approximately ten work days.

Weir

The adjustable weir gate system will need to have general maintenance on an annual basis. Main components to be inspected and maintained are the air compressors, receiver tank, connection to the air bladder, gate leaves, restraining straps, protection plate, and protection plate wheel.

Infrequent maintenance may require that the area be dewatered. Stoplogs can be placed upstream to block off the area so maintenance can be performed in the dry. If the bladder needs to be accessed, there are attachment points on the gate leaves and pier walls so the gate can be in the raised position without the bladder holding up the gate leaf.

Fish Ladder

The fish ladder foundation and walls should be inspected for structural integrity, cracking, and other signs of damage. Visual, surface level inspections of concrete elements will be made to identify obvious defects, hazards, or potential problems, and to monitor known problems.

Inspections and maintenance should be recorded to provide a historical account of the fish ladder's condition. Any cracking or other signs of damage to the ladder structure should be recorded. The ladder structure should be inspected in accordance with the following:

- Confirm the fish ladder ramps, slots, and weirs have not been damaged.
- Inspect the weirs, slots, and walls for signs of cracking, spalling, or corrosion.
- Check the extent of vertical and horizontal cracking; cracks that run the entire height or width of the ladder may indicate movement or undermining of the ladder's foundations.

The fish ladder will be sluiced using higher flows to dislodge any accumulated debris or sediment. The gate on the upstream pool and weir will be opened to accommodate this sluicing. Some sediment or debris may not be removable by sluicing, due to eddies typical of vertical slot ladders. If apparent a high-pressure water source will be used to remove built-up sediment, grit, biological growth (algae), and other debris that has accumulated in the fish ladder structure. The stoplogs can be removed from the entrance weir so that the entire fish ladder is drained.

The fish ladder should be inspected and cleaned regularly, and debris should be removed by properly trained personnel. Infrequently, larger debris may become jammed within the fish ladder. The trashrack is anticipated to limit all larger debris that could enter the ladder, though if any larger debris does pass, it will likely need to be dislodged manually.

All maintenance activities should occur during the non-irrigation season when the ladder is not in use.

Environmental Setting

Historically, the Calaveras was a river of extremes, flooding in the winter and drying up in summer, with some sections going completely dry and creating disconnected pools. The original Hogan Dam was built in 1930 to protect the City of Stockton from flooding. New Hogan Dam was completed in 1963 to expand storage capacity of the reservoir from 75,062 to 317,000 acre-feet. The impoundment of New Hogan altered the river's historical flow patterns and provides a more consistent year-round flow of water downstream to the Bellota Weir and Intake Facility (Figure 2) as evidenced by the District's year-round flow commitment described in the CHCP.



Figure 2. Current configuration of the Bellota Intake.

The Bellota Weir was originally constructed in 1967 and in 1978, SEWD began the year-round operation of an unscreened, gravity-fed diversion (maximum capacity of 75 cfs) at Bellota, for which low but sustained flows are released from New Hogan during non-flood control periods. Since 1978, when SEWD began diverting water at the Bellota Diversion, low but sustained flows have been provided year-round above Bellota in most years. Immediately downstream of Bellota, Mormon Slough was created in 1910 by the U.S. Army Corps of Engineers to convey flood waters to avoid flooding in the City of Stockton. Mormon Slough is a wide channel with steep banks and little to no overhead vegetation.

The Bellota Weir (Figure 3), located at the top of Mormon Slough immediately downstream of the divergence of Mormon Slough and the Old Calaveras River channel/Calaveras River Headworks, is a removable check dam (i.e., flashboards and stanchions; Figure 4). During the irrigation season (generally April 15- October 15), the height of the weir is increased to eight-ft to provide the hydraulic head needed for SEWD to divert Calaveras River water into the Bellota intake for use in Potter Creek and the WTP, or into the Headworks Facility for use in the Old Calaveras River channel. Further, flow control slide gates are installed on the face of Bellota Weir to divert flow into Mormon Slough. Generally, the Bellota Diversion is installed approximately April 15 and removed approximately October 15. In years when irrigation demand is earlier than normal due to drier conditions, SEWD obtains variances from the Reclamation Board for earlier installations.



Figure 3. Photo of Bellota Weir from ground level during high flow event.



Figure 4. The 8-ft flashboard dam installed on upstream sill of the Bellota Weir.

Upon removal of the eight-ft flashboard dam from the upstream edge of the Bellota Weir, SEWD typically replaces it directly with a two-ft temporary dam and fish ladder (Figure 5). The temporary dam is installed to provide the hydraulic head needed for SEWD to divert Calaveras River water either into the Bellota intake for SEWD's WTP, or into the Headworks Facility for groundwater recharge in the Old Calaveras River channel. The fish ladder is installed to maximize upstream fish passage opportunities from the pool on the apron of Bellota Weir to areas above Bellota.



Figure 5. Overhead view of the Bellota Weir with the temporary fish ladders installed.

A second two-foot temporary dam and fish ladder is also installed at the downstream side of the Bellota Weir apron. This lower ladder was funded through the USFWS's AFRP and is installed to increase opportunities for upstream migrating fish to access the upper ladder. Even with both ladders installed at the weir, fish passage is not always available and is dependent on sufficient flows at the weir. Flows greater than 10 cfs are needed prior to opening the upper ladder due to diversion constraints (i.e., at least 10 cfs is required to maintain enough head for diversion to occur at Bellota).

As part of SEWD's agricultural water delivery operations, flashboard dams are installed at twelve locations throughout Mormon Slough, beginning April 15 and removed from the river by November 1. This would effectively exclude all migrating adult salmonids from the project area during the anticipated in-water work window (June 15 - October 31). Juvenile salmonids would both emerge and/or migrate prior to the anticipated work window and would therefore be unaffected by the project. The in-water work window has been discussed with the construction management and engineering partners (KSN, Inc. and HDR, Inc., respectively) for the project and any contracted construction service will be informed of this limitation.

The proposed project area is bounded on its north side by Highway 26 and agricultural land and to the south by East Shelton Road. Land use in the area is predominantly agricultural, typified by large orchards surrounding the proposed project area. The western end of the project area is the Escalon-Bellota Bridge, which is approximately 1,400 feet downstream of the divergence of the Calaveras River and Mormon Slough (Figure 6).



Figure 6. Aerial view of the current configuration of the project area.

Currently, the project area downstream of the Bellota Weir features degraded riprap on both banks in addition to thickets of various shrub and tree species that offer limited shaded riparian area and cover (Figure 7). Substrates in the project area consist of mixed gravel and sand/silt with the main channel running close to the southern bank during most of the year at low stream flow. Emergent vegetation occurs in the channel, consisting of sandbar willow (*Salix exigua*) and various annual grasses on dried areas near the channel when flows are low. Non-native Himalayan blackberry (*Rubus discolor*) dominates the vegetation along the banks in certain areas immediately downstream of the Bellota Weir.



Figure 7. View from above the weir showing habitat available downstream at lower flows.

The upstream portion, immediately above the Bellota Weir, features a heavily riprapped northern bank with little overhead or emergent vegetation at all river stages. Further, the substrate in this area consists of a mix of sand/silt/mud, coarse cobble, and riprap that has eroded into the channel. When the flashboard dam is in place at the Bellota Weir, this area ponds and resembles a lacustrine (rather than a riverine) environment and stream elevation becomes much higher. Habitat in the Old Calaveras Headworks channel appears more natural, with softer gradient banks with grasses and some overhead cover prior to the temporary exclusion net and the Headworks facility itself (Figure 8).



Figure 8. The current configuration of the Old Calaveras Headworks at low flows.

Fisheries Resources

Based on data available from the UC Davis PISCES database (UC Davis 2017), native fish known to historically occur near the project area include multiple runs of Chinook salmon, Central Valley steelhead, threespine stickleback, Pacific lamprey, prickly sculpin, riffle sculpin, Sacramento blackfish, Sacramento perch, Sacramento pikeminnow, Sacramento splittail, Sacramento sucker, Sacramento tule perch, sDPS green sturgeon, thicktail chub, western brook lamprey, and white sturgeon (Table 2).

Non-native species that may be present in the lowest reaches of Mormon Slough/Old Calaveras River include American shad, bigscale logperch, black crappie, blue catfish, bluegill sunfish, brown trout, channel catfish, common carp, fathead minnow, goldfish, red shiner, redear sunfish, smallmouth bass, spotted bass, striped bass, threadfin shad, wakasagi, warmouth, white catfish, and white crappie. In addition to these species, green sunfish, largemouth bass, pumpkinseed, and western mosquitofish have been observed approximately 5.5 miles upstream during operation of a rotary screw trap at the Shelton Rd. Bridge Crossing (RM 26) over the past 5 years.

Two readily accessible government websites were used to determine applicable critical habitat designations and fish species listed as threatened or endangered by the Endangered Species Act (ESA). The first source was a project-planning tool (Information for Planning and Conservation; IPaC) provided by the U.S. Fish and Wildlife Service (USFWS 2015; accessed March 15, 2022). The location used in the planning tool was a 30-acre area encompassing the designated project area. The IPaC data viewer and automated reporting system indicated that a critical habitat designation was not found for fisheries resources managed by USFWS within or near the project area.

The second source utilized was the NOAA Fisheries website (NOAA 2015; accessed on March 15, 2022). GIS shapefiles were downloaded from the website and viewed using Google Earth Pro software. All shapefiles of critical habitat designations for ESA listed Chinook salmon stocks, Central Valley steelhead, and sDPS green sturgeon were downloaded. Examination of the shape files revealed that critical habitat for the sDPS green sturgeon includes waterways nearest the confluence with the San Joaquin River, well downstream of the project area. The entirety of the Calaveras River below New Hogan Dam has been designated as critical habitat for Central Valley steelhead. No critical habitat designations were observed for either Central Valley spring-run or Sacramento River winter-run Chinook salmon in the Calaveras River.

Based on this information, this technical memorandum focuses on the following species (Table 3):

- Chinook salmon (*O. tshawytscha*)
- Central Valley steelhead (*O. mykiss*)

Table 2. Non-ESA-listed native fish species that historically utilized habitat near the project area, irrespective of temporal distribution.

| Common Name | Species | Origin | Demersal/Pelagic |
|--|------------------------------------|--------|------------------|
| Chinook salmon – Central Valley fall/late fall-run ESU | <i>Oncorhynchus tshawytscha</i> | Native | Pelagic |
| Pacific lamprey | <i>Entosphenus tridentatus</i> | Native | Demersal |
| Prickly sculpin | <i>Cottus asper</i> | Native | Demersal |
| Riffle sculpin | <i>Cottus gulosus</i> | Native | Demersal |
| Sacramento blackfish | <i>Orthodon microlepidotus</i> | Native | Pelagic |
| Sacramento hitch | <i>Lavinia exilicauda</i> | Native | Pelagic |
| Sacramento pikeminnow | <i>Ptychocheilus grandis</i> | Native | Pelagic |
| Sacramento splittail | <i>Pogonichthys macrolepidotus</i> | Native | Pelagic |
| Sacramento sucker | <i>Catostomus occidentalis</i> | Native | Demersal |
| Sacramento perch | <i>Archoplites interruptus</i> | Native | Pelagic |
| Sacramento–San Joaquin tule perch | <i>Hysterocarpus traskii</i> | Native | Pelagic |
| Thicktail chub | <i>Gila crassicauda</i> | Native | Pelagic |
| Threespine stickleback | <i>Gasterosteus aculeatus</i> | Native | Pelagic |
| White sturgeon | <i>Acipenser transmontanus</i> | Native | Demersal |

Table 3. Federal/State endangered or threatened species summary table for the construction site.

| Species | Listing Status ¹ | Listing Agency | Potentially Present During Construction | Potential Critical Habitat Present | Potential to be Impacted |
|---|-----------------------------|----------------|---|------------------------------------|--------------------------|
| Central Valley steelhead (adult) | FT | NMFS | Y ² | Y | Y |
| Central Valley steelhead (juvenile) | FT | NMFS | Y ³ | Y | Y |
| Central Valley spring-run Chinook salmon (adult) | FT / ST | NMFS / CDFW | N ⁴ | N | N |
| Central Valley spring-run Chinook salmon (juvenile) | FT / ST | NMFS / CDFW | N ⁵ | N | N |

¹ Listing status: F = Federal, S = State, T = Threatened, E = Endangered

^m Species is migratory and may be present short-term during migration

²Hallock 1989, ³ Moyle et al. 2008, ⁴ Cramer and Demko 1997, ⁵ Yoshiyama et al. 1998

Chinook salmon

Fall-run (FR) Chinook salmon are not currently listed under the ESA. They are, however, listed as a Species of Special Concern (SSC) under the California Endangered Species Act (CESA) due to concerns about population size and dependence on hatcheries. FR Chinook salmon have used the Calaveras River opportunistically, with strays from other basins

entering when conditions permit. Adult FR Chinook salmon typically migrate to spawning grounds in the San Joaquin River tributaries from September through December. If present, adult salmon typically spawn upstream of Bellota.

In years when adult salmon migrate into the Calaveras River, juveniles may be produced and may rear in the primary spawning and rearing reach upstream of Bellota until ready to begin their seaward migration. Juvenile salmon migration from the San Joaquin tributaries occurs between January and June, with peak migration from February through May.

Files downloaded from the NOAA website show that the project area does not lie within designated critical habitat for spring-run (SR) Chinook salmon, however, there is currently an effort to restore this run to historic spawning grounds in the upper San Joaquin River. Central Valley SR Chinook salmon were originally listed as “threatened” under the ESA in September 1999 (NOAA 1999) and an updated review of their status in April 2014 maintained that “threatened” designation (NOAA 2014). SR Chinook salmon have designated critical habitat in San Joaquin County (NOAA 2005) based on historic occurrence, but the overall size of a naturally occurring population in the San Joaquin River is poorly understood due to their low catch rates and the presence of a recently introduced “experimental” hatchery-origin population. The NOAA ESU definition specifically refers to naturally spawned SR Chinook salmon originating from the Sacramento River and its tributaries, and those salmon originating from the Feather River Hatchery Spring-Run Chinook Program.

In recent years, the San Joaquin River Restoration Program (SJRRP) has taken steps to reintroduce SR Chinook salmon to the San Joaquin River. Adult Spring-run Chinook salmon produced by the SJRRP began returning to the Restoration Area on the lower San Joaquin River in 2019. Six PIT tagged adult salmon were detected on antennas in the Stanislaus River in 2021 that had been released as yearlings from the SJRRP Salmon Conservation and Research Facility in 2019. Early running adult salmon believed to be returns from the SJRRP were also observed on the Tuolumne River in 2021. To the best of our knowledge, no SR Chinook salmon have been observed in the Calaveras River to date. It is unlikely that returns from the SJRRP would stray into the Calaveras River given that their upstream migration occurs when flashboard dams are in place.

Potential to be exposed to project effects

Adult FR Chinook salmon may be affected by this project, though impacts to adults would be limited to periods when work is occurring outside the irrigation season. SR and WR Chinook salmon are not anticipated to utilize the Calaveras in any given year. As previously noted, flashboard dams are installed at twelve locations throughout Mormon Slough, beginning April 15 and being removed from the river on or about October 15. This would effectively exclude all migrating adult Chinook salmon from the project area during the anticipated work window.

Juvenile Chinook salmon generally emerge and migrate prior to the anticipated work window between January and June and would therefore be largely unaffected by the project. Further, a rotary screw trap (RST) has been used to monitor juvenile salmonids the Calaveras River since 2002. Since the initiation of monitoring, juvenile Chinook salmon have been observed in only 60 percent of the monitoring seasons (with only one juvenile Chinook observed during the 2008 monitoring season). Since 2002, only 22,135 individuals (average = 1,165) have been captured at the RST with the majority of outmigrating juvenile Chinook (95.7%) captured between November and May, outside of the in-water work window of June 15- October 31. For context, RST sampling in the nearby Stanislaus River can yield thousands of juvenile Chinook salmon in a single day. This underscores the opportunistic utilization of the Calaveras River by Chinook salmon as the monitoring seasons with the largest number of juveniles encountered in the RST have typically occurred immediately after wet water year types (e.g., WY 2006 and 2017). Very wet water years fill the reservoir and result in a need to discharge significant volumes during the migratory period for adult FR Chinook salmon to reach top of conservation storage. These flood-control discharges result in connectivity with the San Joaquin River and attract straying Chinook salmon into the Calaveras River.

Central Valley Steelhead

O. mykiss is a species of salmonid native to California, commonly known as steelhead (the anadromous form) or rainbow trout (the resident/freshwater form). The California Central Valley steelhead has been listed as “threatened” under the ESA since January 2006. Adult anadromous steelhead can be expected to enter freshwater streams between August and November and spawning typically takes place between December and April. Juveniles begin to emerge from late winter to summer and will then spend between one and three years in freshwater before emigrating in the spring (Williams 2006). Habitat modeling conducted by Lindley et al. (2006) suggests that waterways on the floor of the Central Valley are unfavorable spawning and rearing locations for steelhead due to their excessively high summer temperatures. This same study also noted that many of the small tributaries of the San Joaquin are generally too degraded to support viable populations. With the substantial population of *O. mykiss* found upstream, the Calaveras proves to be unique among smaller San Joaquin/Delta tributaries.

Abundance data reveal that populations in the Central Valley are relatively small for naturally occurring steelhead. *O. mykiss* counts at the Red Bluff Diversion Dam from 1967 to 1993 revealed a precipitous decline in returns to the upper Sacramento River. While more recent data are scarce, an updated report from NOAA Fisheries (Good et al. 2005) estimated an average of 3,628 naturally spawning female steelhead in the Central Valley between 1998 and 2000, based on the adipose-fin-clip ratio.

While the importance of the Calaveras River for steelhead production is currently unknown, it is classified as a Core 1 watershed for recovery, which means that it has the potential to support a viable steelhead population. Annual snorkel surveys have been

conducted on the Calaveras River since 2011 to estimate the abundance of *O. mykiss* downstream of New Hogan Dam. Since then, abundance estimates of *O. mykiss* have fluctuated greatly from a low of 650 in 2016 to a high of 23,089 in 2018. The estimated overall abundance of *O. mykiss* (all life stages combined) in the Calaveras River based on snorkel surveys in 2021 was 16,260 fish (95% confidence interval: 8,980–23,542), which represents a slight increase over the 13,551 fish estimated in 2020 and is the second highest estimated abundance since periodic snorkel surveys were implemented (SEWD and FISHBIO 2022).

As previously discussed, rotary screw trapping has been conducted in the Calaveras River at Shelton Road since 2002. Since the initiation of sampling, total annual catch of *O. mykiss* (juveniles and adults combined) has ranged from 60 to 2,818 individuals in 2017 and 2010, respectively (average = 1,051). The total estimated abundance over the same period has ranged from 199 to 12,523 in 2016 and 2020, respectively (average = 4,559).

Potential to be exposed to project effects

Adult *O. mykiss* may be affected by this project, though impacts to adults would be limited to periods when work is occurring outside the irrigation season. However, it should be noted that in-water work outside of the irrigation season would be limited to the installation of sheet piles to allow for work areas to be dewatered for the protection of aquatic species. As part of SEWD's agricultural water delivery operations, flashboard dams are installed at twelve locations throughout Mormon Slough, beginning April 15 and being removed from the river by November 1. This would effectively exclude all migrating adult *O. mykiss* from the project area during the June through September work window. As there is only potential to impact adults during limited periods outside of the in-water work window, this assessment finds that there is little to no potential for the project to impact adult *O. mykiss*.

Juvenile *O. mykiss* rearing does not occur in the project area and migration during the spring does not overlap with the proposed summer work window. It should be noted that if in-water work is occurring, sheet piles would be used to exclude fish from the work area and a bypass would be provided to allow water to flow downstream. It should be noted however, that no considerations for fish passage will be proved during the non-migration period (e.g., the in-water work window; June 15 to October 31). Therefore, juvenile *O. mykiss* may be minimally affected by the project.

Critical Habitat and Magnuson-Stevens Act Essential Fish Habitat

As previously noted, the project area lies at the Calaveras River divergence point between the Old Calaveras and Mormon Slough. Mormon Slough has been extensively modified to for flood flow diversion and irrigation water conveyance since the early 20th century. As such, it offers little value as habitat for special status species, particularly cold-water fishes like salmonids, beyond its temporally limited function as a migratory corridor. The Old Calaveras River channel was historically the mainstem of the river but has been a

secondary channel since 1934, when the Linden Irrigation District built the Old Calaveras Headworks Facility and flows were primarily directed into Mormon Slough (Crow 2006). The Old Calaveras becomes more channelized with less cover as it progresses downstream. The substrate in the upper third of this reach consists of sand and silt with limited gravel and cobble and the lower two thirds of the reach consist of mostly sand, silt, and clay. Due to the described habitat limitations, the Old Calaveras offers no utility for salmonids for spawning or rearing.

Further, as discussed in the CHCP, key habitat to be conserved and utilized by both spawning and rearing salmonids lies in the 18 miles of suitable habitat above the Bellota Weir, upstream of the project area. Additionally, while the Calaveras does contain designated critical habitat for *O. mykiss*, there is no designated critical habitat for *O. tshawytscha*. Therefore, this assessment concludes there would be less than significant impact to critical habitat for *O. mykiss* as a result of the construction activities required to complete the project. Further, once completed, the improved fish passage at the Bellota facilities would allow salmonids improved access to the 18 miles of spawning and rearing habitat available above Bellota.

With regard to MSA Essential Fish Habitat, while the Calaveras River watershed is shown as Essential Fish Habitat for Chinook salmon in the NOAA Fisheries mapping tool, the agency's Biological Opinion issued as part of the issuance of the incidental take permit for the CHCP acknowledges that presence of any run (e.g., spring, winter, fall, or late-fall) of Chinook salmon in the Calaveras River is "opportunistic" and that their numbers do not currently facilitate a self-sustaining population. Further, as referenced in the critical habitat section, habitat available within the project area solely serves as a migratory corridor. Additionally, there is not MSA Essential Fish Habitat designated for Central Valley steelhead. Therefore, this assessment concludes there is no likely impact to MSA Essential Fish Habitat as result of the project.

Individual Take Assessment for Listed Species

Summer, between mid-June and mid-October, is an appropriate work window for the proposed project, after the migratory periods for juveniles of both ESA-listed species are largely complete. As discussed above, SEWD installs flashboard dams downstream of the project area, thereby limiting the migration of adult salmonids into the upper reaches of the Calaveras River until they are removed in mid-October. For these reasons, this assessment assumes there will be minimal take of listed salmonids resulting from implementation of the proposed project.

During construction periods outside of the in-water work window, take of listed salmonids is also expected to be minimal, as adult and juvenile salmonids generally use the areas near Bellota as a migratory corridor and little to no spawning or rearing occurs near the project area. Further, sheet pile cofferdams will be used to exclude listed species from the project area.

After project completion, while the water diversion operations of the Bellota Intake and Headworks Facilities should be comparable to current conditions, the facilities themselves will be much more fish friendly. The temporary exclusion net at the Old Calaveras River will be replaced with a permanent non-entraining barrier and all screening at the intake facilities will be updated to adhere to current NMFS screening criteria. Further, the roughened channel design for the fishway can be considered restorative as it provides a more natural passageway than the current temporary ladder system. Additionally, the new permanent ladder will allow fish to pass at a wider range of flows in the event the roughened channel cannot be utilized (e.g., when the weir gates are closed). Therefore, the operation of the improved Bellota Facilities should have no significant impact to listed species and will serve to improve access and overall quality of their habitat.

Estimated Level of Take as Described in the CHCP

Take Associated with the Operation of the Old Calaveras Headworks

The potential level of take associated with current SEWD Old Calaveras River Headworks Facility operations and the rationale for the estimate is provided in Chapter 8.2.2 of the CHCP. Approximately 218 YOY *O. mykiss* and 1,217 FR Chinook fry could encounter the Headworks Facility annually and potentially be entrained into the Old Calaveras River. Although all salmonids greater than 60 mm (i.e., juvenile FR Chinook migrating April-July and Age 1+ *O. mykiss*) should be prevented from entering the Old Calaveras River by the barrier net, some may pass through if the net is damaged or pushed out of position by debris or other factors. For this reason, take estimates for salmonids greater than 60 mm were calculated by the method described above for YOY (as though the net barrier was not in place). Therefore, up to 169 Age 1+ *O. mykiss* and up to 1,220 FR Chinook parr/smolt could encounter the Headworks Facility annually and potentially be entrained into the Old Calaveras River.

The total estimated take numbers of *O. mykiss* juveniles and FR Chinook juveniles are 387 (218 YOY and 169 Age 1+) and 2,437 (1,217 fry and 1,220 parr/smolt), respectively. The amount or extent of adult salmon and/or steelhead take associated with this activity is difficult to predict because of uncertainties associated with:

- 1) lack of direct observations of adults being impeded or blocked by the Headworks Facility during their upstream migration;
- 2) magnitude and duration of flows necessary for fish passage at numerous individual structures in the Old Calaveras River channel downstream of the Headworks facility;
- 3) effectiveness of the temporary barrier net for kelts.

Therefore, the adult take estimate of 20 *O. mykiss* and three FR Chinook salmon was based on the maximum number of fish observed during previous surveys

Take Associated with the Operation of the Bellota Diversion Facility

The potential level of take associated with current SEWD Bellota Diversion Facility operations and the rationale for the estimate is provided in Chapter 8.2.3 of the CHCP. Up to 251 YOY *O. mykiss* and 3,650 Chinook juveniles <60 mm could encounter the Bellota Diversion Facility and potentially be entrained into the Bellota Intake in most years. In critical water years, flashboard dams without passage notches may be installed as early as February. If the flashboard dams are installed early, downstream passage past Bellota would be prevented to reduce potential impacts to juveniles greater than 60 mm (i.e., juvenile Chinook migrating April-July and Age 1+ *O. mykiss* February-July), resulting in increased exposure of YOY *O. mykiss* and Chinook juvenile migrants to the Bellota Diversion Facility. Under this critical water year scenario, up to approximately 502 YOY *O. mykiss* and 7,300 Chinook juveniles <60 mm could encounter the Bellota Diversion Facility and potentially be entrained.

The proposed permanent fish screen is designed to meet NMFS's mesh screen requirements to prevent entrainment of juvenile salmonids (NMFS 1997). However, the sweeping velocity will not always be met so impingement of some juvenile salmonids may occur at the Bellota intake, resulting in injury or mortality of affected individuals. Additionally, individuals that survive impingement are expected to be more vulnerable to predation due to injury or disorientation. Take associated with impingement is anticipated to be substantially lower than that from entrainment.

Take Associated with the Operation of the Bellota Weir

Additionally, take resulting from the Bellota Weir itself is expected to be similar to the potential level of take associated with artificial instream structures and SEWD small instream dam operations described in Chapter 8.2.4 of the CHCP. Up to approximately 137 YOY, 81 Age 1+, and 21 adult *O. mykiss* and 210 juvenile and 464 adult FR Chinook could encounter and be affected by small instream dam structures. However, it should be noted that these take estimates also overlap with estimated take for New Hogan non-flood control operations. Additionally, take could occur during cofferdam installation and removal within the wetted channel. Due to the short timeframe of possible effects, take was identified as half of the maximum annual number of individuals anticipated to be affected annually by long-term operations of small instream structures. Therefore, up to approximately 69 YOY, 41 Age 1+, and 11 adult *O. mykiss* and 105 juvenile and 232 adult FR Chinook could encounter and be affected by construction activities. Note that these take estimates also overlap with estimated take for New Hogan non-flood control operations and take for this project would be a small portion of the above estimate annually.

Take Associated with the Construction Activities

Finally, take could occur during construction activities conducted within the wetted channel for Bellota Diversion Facility improvements under Conservation Strategy 7 (CS7). Due to the timing of cofferdam installation and removal (up to two weeks in early April and in late October, respectively), the estimated number of YOY salmonids that may be affected by heavy equipment, fish dispersal, removal, and/or relocation efforts during cofferdam installation, and

by turbidity during cofferdam installation and removal is anticipated to be less than half of those that may be entrained into the diversion, which would be up to 126 YOY *O. mykiss* and 1,825 Chinook juveniles <60 mm in most water years and 251 YOY *O. mykiss* and 3,650 Chinook juveniles <60 mm in critically dry years. The estimated number of Age 1+ *O. mykiss* is 41 and juvenile Chinook >60 mm is 899 in most water years and is 82 Age 1+ *O. mykiss* and 1,798 Chinook juveniles >60 mm in critically dry years.

Avoidance and Mitigation Recommendations

The planned timing of in-water construction activities provides the most appropriate work window to adequately protect aquatic organisms. The presence of species of concern is expected to be minimal or nonexistent during the summer months when construction activities are scheduled. This is due to a lack of overlap between the project window and adult and juvenile migration timing (Table 4), operation of flashboard dams downstream of the project area precluding upstream migration of adult salmonids during the entire in-stream work window, and an absence of spawning and rearing habitat in the project area.

Table 4. The potential of each species of special concern, their pertinent life stages, and their likelihood of occurrence in the project area.

| Species | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Steelhead (adult) | | | | | | | 1 | 1 | 1 | 1 | 1 | |
| Steelhead (juvenile) | | | | | | | 1 | 1 | 1 | 1 | 1 | |
| Fall-Run Chinook salmon (adult) | | | | | | | 1 | 1 | 1 | 1 | 1 | |
| Fall-Run Chinook salmon (juv.) | | | | | | | 1 | 1 | 1 | 1 | 1 | |

Note: White boxes = unlikely to be present in the project area; Gray Boxes = potentially present in the project area; ¹ = intended work window.

Fine sediments may be incidentally introduced to the river as a result of project activities, but their effect should be negligible as salmonids are not expected to be present in or directly downstream of the project area. Best management practices utilized during construction and erosion control measures along the perimeter of all work areas will be implemented to intercept and capture sediment prior to entering Waters of the U.S.

A proposed turbidity standard for the adequate protection of fish and wildlife habitats in California states that turbidity (measured in NTUs; nephelometric turbidity units) should not exceed 20% above natural background turbidity (Bash et al. 2001).

A sheet pile cofferdam will be installed and dewatered prior to construction to route water and any aquatic species around the project activity. Cofferdams will be constructed starting at the upstream end and ending at the downstream end so that fish have an opportunity to disperse downstream. Prior to dewatering the cofferdam, any fish remaining behind the cofferdam will be captured and relocated downstream of the project site by qualified fish biologists according to NMFS-approved methods as described in the CHCP.

If sheet piles need to be driven or any other in-water work must occur outside of the aforementioned in-water work window, FISHBIO recommends that a qualified fisheries biologist be present to act as a biological monitor to monitor sound levels generated from pile driving and evaluate fish presence or health in the immediate project area. The most appropriate threshold for incidental take (of fish displacement, behavior modification, injury, or death) associated with elevated underwater noise is an ecological surrogate of the amount of habitat affected by elevated underwater noise and vibration within a certain distance from the construction site. Elevated noise disturbance is also expected to elevate fish stress levels even when no behavior changes are observed and are expected to decrease individual's overall fitness and survival through compounding sub-lethal effects.

Vibratory pile driving is expected to produce underwater pressure levels over 150 dB root mean squared (RMS) up to 2,154 meters from the location of the pile driving sites. Though underwater sound levels are not expected to injure or kill fish directly, since the sounds will be above the effective quiet threshold (~76 dB), they are expected to cause disruption of normal habitat utilization, stress, and elicit temporary behavioral effects in any Covered Species that are present, which could lead to harm as described below. Any behavioral alterations in juvenile fish are expected to decrease their fitness and survival by decreasing feeding opportunities, which will decrease their growth, and by causing area avoidance which will delay their downstream migration and increase their predation risk. Beyond 2,154 meters, underwater sound is expected to attenuate down to effective quiet underwater sound levels, or 150 dB RMS or less, and therefore 2,154 meters from the pile being driven is considered the limit of this ecological surrogate. The behavioral surrogate will be limited in general to within 2,154 meters from the boundary of the construction footprint and any cofferdam placement and exceeding 150 dB RMS beyond 2,154 meters from the construction site boundary will be considered an exceedance of expected incidental take levels for this surrogate.

Impact pile driving is also expected to produce underwater pressure waves that are expected to injure or kill any Covered Species within 18 meters of the pile being driven. The largest size of pile is estimated to produce a maximum peak sound of 210 dB. Risk to fishes will be present if impact pile driving is occurring. Beyond 18 meters, cumulative sound exposure levels (SELs) are expected to injure fish that remain in the area during in-water pile driving activities. Injuries to fish are expected to occur up to 1,597 meters from the driven pile. Beyond these distance thresholds, underwater pressure waves are expected to decrease below lethal and injurious levels. The lethal distance surrogate will be limited to an 18-meter radius from each pile driven with an impact hammer. The injurious distance surrogate will be limited 1,597 meters from the construction site boundary and exceeding 206 dB peak or 187 dB cumulative SEL, respectively, beyond these distances will be considered exceeding expected incidental take levels for these surrogates.

A summary of the total number and types of piles to be driven as well as the estimated duration of installation for the piles is provided in Table 5.

Table 5. Bellota pile summary. Table adapted from information provided by ECORP Environmental Consulting, Inc.

| Pile Type | Pile Description | Purpose & Locations | Total Number | Installation Duration | Total Installation Duration (Hours) |
|---------------|---|--|--------------|-----------------------|-------------------------------------|
| Pipe Piles | 24-inch diameter plugged steel pile with 0.5-inch wall thickness | Substructure support for Intake, Fishway, Weir and both diversion structures | 249 | 1.0 pile per hour | 249 |
| Sheet Piles | The majority are AZ14-770 sheet pile walls except S4 which is a king pile wall (HZ630M-12/AZ18-800) | Seepage control and retaining wall purposes | 486 | 2.0 min/vertical foot | 562 |
| Stone Columns | 24-inch diameter stone column | Support structures sensitive to differential settlement which includes the Bellota and Old Calaveras Conveyance Structures | 229* | 2.0 columns per hour | 115 |

* = Number shown is for 116 stone columns for the OCR conveyance pipelines that are currently in the design, plus an additional 113 stone columns anticipated to be added at the 100% design phase to support the Bellota conveyance pipelines

Sluicing, either in the interim or long-term operations of the weir, can be problematic for fisheries resources within the vicinity of the weir. Two issues that can result from sluicing are: 1) sluicing sand/silt debris can lead to increased turbidity immediately downstream of the discharge and 2) that fish may be entrained during the release of effluent materials. While turbidity concerns are discussed above, it should be noted that turbidity plumes resulting from sluicing are not anticipated to be in excess of those experienced during a typical rainfall/freshet event, and therefore, should have less than significant effects to listed species and/or their habitat. While sluicing is dependent on need based on debris load, all efforts should be made to avoid sluicing during the non-migration season. If sluicing is required during the non-migration season, it should be conducted during the mid-morning to late afternoon to avoid periods when fish would be actively migrating, as salmonids generally migrate overnight.

Upon completion of construction activity, the project implementation team (SEWD, KSN, Inc., and/or their contractor) will ensure all equipment and excess materials will be transported off site using the same routes used for setup. Levee slopes will be seeded to promote re-vegetation and minimize soil erosion. Any damage caused to the levee road or surrounding areas by construction activities will be repaired. The staging area will then be cleaned of any rubbish and all parts of the work area will be restored to its original condition. As this assessment assumes there will be no significant impact to critical and/or essential habitat for listed salmonids and that there will be little to no take of individuals

as a result of the proposed project, no additional mitigation beyond the conservation of the current riparian habitat available in the project area is proposed.

Summary and Conclusions

This review assessed the potential for protected fish species to be exposed to the project, the possible effects of the project on those fish species, and recommendations to help avoid and mitigate any potential negative impacts. Overall, the project site features characteristics of a relatively disturbed area, provides low amounts of suitable habitat for cold-water fishes, routinely dries during the summer periods even in wet water year types (downstream of Bellota Weir), and as noted by the CHCP, is dependent on the described improvements to improve fish passage and reduce issues relating to entrainment within the Bellota complex.

Review of available reports and data regarding the project area identified two species for further assessment, Chinook salmon and Central Valley steelhead. Chinook salmon and steelhead both use the nearby San Joaquin River as a migratory corridor. However, based on historic occurrences, viable population base, and irregular migration opportunity to upstream habitats on the Calaveras River, Chinook salmon are unlikely to rear or spawn within the project area. In contrast, the Calaveras River provides *O. mykiss* with adequate habitat year-round in the 18-mile reach upstream of Bellota, as identified in the CHCP. The *O. mykiss* population found in the Calaveras River is important to the potential overall contribution to the anadromous life-history in the San Joaquin Basin, yet the extent of this contribution remains unknown. However, the *O. mykiss* population in the Calaveras River below New Hogan Dam has proven resilient and persistent throughout a wide degree of water year types and environmental conditions.

Following project completion, aquatic habitats within the project area will be substantially improved compared to existing conditions. The roughened channel fish passage design will be much more comparable to that under historic conditions prior to the construction of the Bellota Weir and Diversion Facility. Further, the revised and permanent fish ladder included in the improved design will accommodate fish passage under a wider range of flow conditions than the temporary Denil fish ladders currently utilized.

Overall, this project is restorative to the current habitat as the roughened channel design will increase instream habitat complexity allowing multiple holding locations for fish as they proceed upstream. Further, the overall project also enhances anadromous fish passage by constructing a permanent ladder that can accommodate a wider range of flows than the current temporary ladders. The project will also reduce the entrainment potential of fish transiting the project area. Given consideration of all these factors, this project will be a contribution toward the recovery of special-status salmonids in the watershed.

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