

Memo



To: Jeff Twitchell
From: Lynn Hermansen and Eric Htain
Date: January 23, 2020
cc: Jeffrey Twitchell
Re: Biological Resources Constraints Assessment for the Community of Locke
Small Communities Flood Risk Reduction Feasibility Study
Sacramento County, CA
GEI Project 1800778

GEI Consultants, Inc. (GEI) is assisting the Sacramento County Department of Water Resources in conducting a feasibility study to evaluate structural and non-structural actions to reduce the risk of flooding to the Locke study area. The feasibility study is being funded under the California Department of Water Resources (DWR) Small Communities Flood Risk Reduction Program. As part of this feasibility study, GEI conducted a biological resources assessment to identify potential biological resources constraints within the study area. This Technical Memorandum summarizes the findings of the biological resources constraints assessment.

Project Location and Setting

The Locke study area is located along the east bank of the Sacramento River in Sacramento County, California, between The Meadows Slough to the north, Snodgrass Slough to the east and immediately north of the Delta Cross Channel (**Figure 1**). The study area includes approximately 1 mile along the east bank of the Sacramento River, approximately 1.5 miles of levee along The Meadows Slough, approximately 2.4 miles of levee adjacent to Delta Meadows State Park, and approximately 0.75 miles of levee along The Delta Cross Channel. California State Route 160 (CA-160), River Road, is located along the Sacramento River following the eastern boundary of the study area.

Land use supports natural preserve, agriculture, and residential areas. The north end of the study area includes primarily natural preserve adjacent to Meadows Slough and Snodgrass Slough. Residences are localized on the southwest boundary of the study area along River Road adjacent to Sacramento River. Agricultural land is situated north of the residential area, between River Road to the west and Delta Meadows to the east.

Methodology

Information on the biological resources known or with potential to occur in the project area and vicinity is based on information obtained by reviewing historical aerial photographs and biological resources databases, including the U.S. Fish and Wildlife Service [(USFWS); USFWS 2018], National Marine Fisheries Service [(NMFS); NMFS 2018] California Department of Fish and Wildlife (CDFW) California Natural Diversity Database [(CNDDDB); CNDDDB 2018] and the California Native Plant Society (CNPS) online inventory of rare and endangered plants (CNPS 2018). These sources were queried for the Clarksburg U.S Geological Survey 7.5-minute quadrangle, within which the study area

is located, and the eight surrounding quadrangles: Courtland, Florin, Bruceville, Liberty Island, Saxon, Isleton, Thornton, and Rio Vista. Copies of the database results are provided in **Appendix A**.

The U.S. Fish and Wildlife Service National Wetland Inventory (NWI) was reviewed to identify any sensitive aquatic features that may have been previously mapped within the study area (NWI 2018). The Natural Resource Conservation Service (NRCS) Web Soil Survey (NRCS 2018) was also queried for the study vicinity and is depicted in **Figure 2**.

GEI reviewed existing databases, documents, and maps to establish an environmental baseline condition for the entire Locke study area. GEI Restoration Ecologist Lynn Hermansen and Biologist Devin Barry conducted a reconnaissance survey in November 2018 to record the site conditions in and around the study area. The survey included photographing the extent of the study area and mapping or confirming previous maps of the general vegetation communities and other biological resources in the study area to verify the information. Based on the review of the database and literature searches and reconnaissance survey, GEI prepared Tables 1 and 2 in **Appendix A** which describe the potential for special-status species to occur within the Locke study area.

Biological Resources

Elevations in the study area along the river bank vary from approximately -2 to 60 feet national geodetic vertical datum (NGVD88). The north-western boundary of the study area represents the highest topographical elevations at approximately 60 feet.

According to the Natural Resource Conservation Service, seven soil types intersect the study area boundary (**Figure 2**). All soils are typically associated with floodplain alluvial processes and are primarily silty clay loam in texture. Soil types include valpac loam, scribner clay loam, egbert clay, gazwell mucky clay, laugenour loam, and fluvaquents.

According to the NWI database, a mosaic of freshwater forested/shrub wetland, freshwater emergent wetland, and riverine features are found in the study area. The Sacramento River is the primary aquatic feature within the study area, located adjacent to the western boundary of the study area. The Meadows Slough is situated at the northwestern boundary of the study area and Delta Meadows State Park.

Vegetation Communities

Vegetation classifications include a crosswalk between Central Valley Riparian Mapping Project (CVRMP) and the National Vegetation Classification Standard (NVCS), whereby habitat is defined by CVRMP and the associated vegetation included in the NVCS (Geographic Information Center 2012; USNVCS 2017, respectively). Extensive mapping of habitats was completed for the Central Valley Flood Protection Plan (CVFPP), including habitats in the study area, under the CVRMP. Habitat classifications in this memorandum are consistent with the classifications for the CVRMP. However, vegetation classifications follow the NVCS standard, which is applicable for future environmental analyses to support CEQA and permitting efforts. The crosswalk combines the two standards so that the information provided below can be used to inform both planning and environmental analysis efforts. According to the crosswalk, there are eight vegetation types in the study area (**Figure 3**).

The Delta Meadows State Park, constituting a majority of the interior study area, is characterized as having riparian forest, riparian scrub, marsh, and seasonal wetlands, though observations are based on

Google Earth aerial imagery and Delta vegetation mapping provided by the U.S. Geological Survey data.

Riparian Forest

Riparian forest was identified primarily along the eastern boundary with small patches throughout the study area. Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), boxelder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), and black willow (*Salix gooddingii*) are the dominant species in this habitat.

Other Natural

Vegetation characterized as *Other natural*, is found throughout the study area and includes annual grasses such as johnsongrass (*Sorghum haepense*), wild oats (*Avena fatua*), and rip-gut brome (*Bromus diandrus*), native trees and shrubs, and naturalized forbs such as sweet fennel, (*Foeniculum vulgare*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), poison-hemlock (*Conium maculatum*), and milk thistle (*Silybum marianum*).

Riparian Scrub

Narrow patches of riparian scrub were identified throughout the study area and includes sandbar willow (*Salix exigua*), California mugwort (*Artemisia douglasiana*), and common buttonbush (*Cephalanthus occidentalis*). Intermixed within patches of riparian scrub also includes hydrophytic vegetation such as scouringrush horsetail (*Equisetum hyemale*) and common rush (*Juncus effusus*).

Marsh

Patches of tidal and non-tidal marsh can be found throughout the study area, with narrow patches along aquatic features and small patches within the interior. Freshwater emergent species such as hardstem bulrush (*Schoenoplectur acutus*) and broadleaf cattail (*Typha latifolia*), and non-native Himalayan blackberry (*Rubus armeniacus*) dominate marsh habitat.

Orchard

Agricultural land in the study area is limited to a portion of the western boundary of the study area and is entirely pear (*Pyrus communis*) orchard.

Seasonal Wetland

Small patches of seasonal wetland were identified in the southern portion of the study area, and include species of naturalized warm-temperate species such as peppergrass (*Lepidium latifolium*) and floating aquatic vegetation such as water fern (*Azolla filiculoides*).

Urban

Urban landscape within the study area includes ground covered by backyard lawns, ornamental plantings, and small structures (e.g., retaining walls, planters, stairs) along the levee landside.

Aquatic

The Sacramento River, the Meadows Slough, and the Delta Cross Channel are the primary aquatic features within the survey area. There are areas of floating vegetation on the surface on the river,

especially surrounding boat docks. Species include water primrose (*Ludwigia peploides*) and water hyacinth (*Eichhornia crassipes*).

Special-Status Species

Review of the database resources mentioned above show that 16 special-status plant species and 27 special-status wildlife species are documented or have potential to occur in the study area, as shown on **Tables 1** and **2** in **Appendix A**. **Figure 4** depicts CNDDDB occurrences of special-status plant and wildlife species within 1 mile of the study area.

Ten species, bristly sedge (*Carex comosa*), Bolander's water-hemlock (*Cicuta maculate* var. *bolanderi*), woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*), delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), delta mudwort (*Limosella australis*), Mason's lilaepsis (*Lilaeopsis masonii*), Sanford's arrowhead (*Sagittaria sanfordii*), marsh skullcap (*Scutellaria galericulata*), side-flowering skullcap (*Scutellaria lateriflora*), and Suisun Marsh aster (*Symphotricum lentum*), have a high potential to occur, with CNDDDB occurrences in the study area. There are 6 additional special-status plant species with moderate potential to occur in the study area (**Table 1**).

The study area supports suitable habitat for five special-status fish species. The following fish species are considered to have a high potential to occur: green sturgeon—southern Distinct Population Segment (DPS) (*Acipenser medirostris*), California Central Valley steelhead DPS (*Oncorhynchus mykiss irideus*), Chinook Salmon—Sacramento River winter-run, Chinook Salmon—Central Valley spring-run (*Oncorhynchus tshawytscha*), and Delta smelt (*Hypomesus transpacificus*). Wildlife species with high potential to occur are western pond turtle (*Emys marmorata*), giant garter snake, (*Thamnophis gigas*), Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*), and American peregrine falcon (*Falco peregrinus anatum*), and Modesto song sparrow (*Melospiza melodia*). An additional ten special-status wildlife species have a moderate potential to occur in the study area (**Table 2**).

Designated USFWS and NMFS critical habitat and Essential Fish Habitat (EFH) occur within the Sacramento River, the Meadows Slough, and the Delta Cross Canal, and border the study area. Critical habitat for five anadromous to semi-anadromous species is present in the study area: green sturgeon DPS, California Central Valley DPS steelhead, Sacramento River chinook salmon, Central Valley chinook salmon, and Delta smelt. The study area also provides EFH for groundfish and chinook salmon.

Findings and Recommendations

Based on review of existing documents, databases, and literature searches, in combination with a reconnaissance field visit of the study area, the study area contains several sensitive vegetation communities and habitat for several special-status species. Sensitive vegetation communities in the study area include riparian forest, riparian scrub, marsh, and open water (aquatic). The majority of these sensitive vegetation communities are present on the water side of the levees surrounding the study area. Seasonal wetlands occur both on the water side of the levees surrounding the study area and in patches within the interior study area near sloughs and ditches. Project activities that have the potential to affect these vegetation communities may require additional studies and environmental permits.

The study area contains habitats that support known occurrences of 10 special-status plant species. The study area also has the potential to support 6 additional special-status plant species and 23 special-status wildlife species. In addition, the Sacramento River, The Meadows Slough, and

Georgiana Slough are considered critical habitat and Essential Fish Habitat (EFH) for several fish species.

Implementation of the project is expected to require compliance with environmental regulations including preparation of a document under the California Environmental Quality Act (CEQA) and regulatory permits including Clean Water Act Section 404 and 401 permits, a permit under Section 10 of the Rivers and Harbors Act of 1899, approvals under the federal Endangered Species Act and California Endangered Species Act, and a Streambed Alteration Agreement from the California Department of Fish and Wildlife.

Prior to coordination with regulatory agencies on the specific compliance document and permits needed for the project, GEI recommends conducting the following studies:

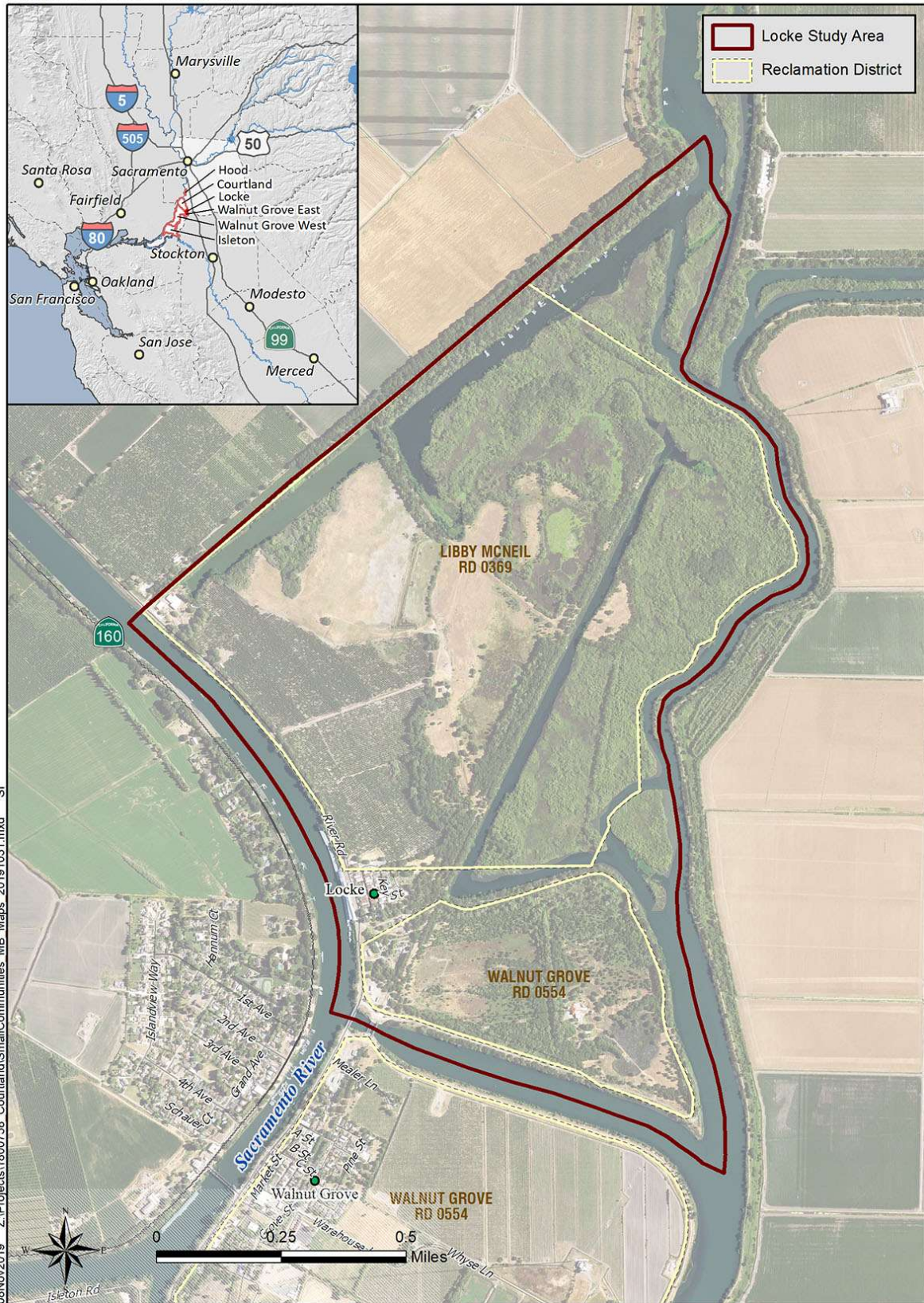
- A wetland delineation of the study area, in accordance with the 1987 USACE Wetland Delineation Manual and Sacramento District standards; and
- Focused habitat classification and assessments to determine the potential impacts of the project on special-status species.

References

- California Department of Fish and Wildlife (CDFW). 2018. California Natural Diversity Database (CNDDDB), Wildlife and Habitat Data Analysis Branch, RareFind Version 5. Commercial version. Available at: <https://www.wildlife.ca.gov/Data/CNDDDB>. (accessed October 24, 2018).
- California Native Plant Society (CNPS). 2018. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society. Sacramento, California. Available at: <http://www.cnps.org/cnps/rareplants/inventory/>. (accessed October 24, 2018).
- Geographic Information Center. 2012. Mapping Standard and land Use Categories for the Central Valley Riparian Mapping Project. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=43372&inline=1>. (accessed on October 24, 2018).
- National Marine Fisheries Service (NMFS). 2018. KMZ of NMFS Resources in California. West Coast Region – California Species List Tools. National Oceanic and Atmospheric Administration. Available at: https://archive.fisheries.noaa.gov/wcr/maps_data/california_species_list_tools.html
- Natural Resources Conservation Service (NRCS). 2018. Web Soil Survey. Available at: <http://websoilsurvey.nrcs.usda.gov> (accessed October 24, 2018).
- National Wetland Inventory (NWI). *See U.S. Fish and Wildlife Service.*
- U.S. Fish and Wildlife Service (USFWS). 2018. Information for Planning and Conservation (IPAC). Species list generator. Available at: <https://ecos.fws.gov/ipac/> (accessed October 24, 2018).
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory. 2018. Wetlands Mapper. Available at: <https://www.fws.gov/wetlands/data/Mapper.html> (accessed October 24, 2018).
- United States National Vegetation Classification (USNVC). 2017. United States National Vegetation Classification Database, V2.01. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC. [usnvc.org] (accessed 11 February 2019).

Figures

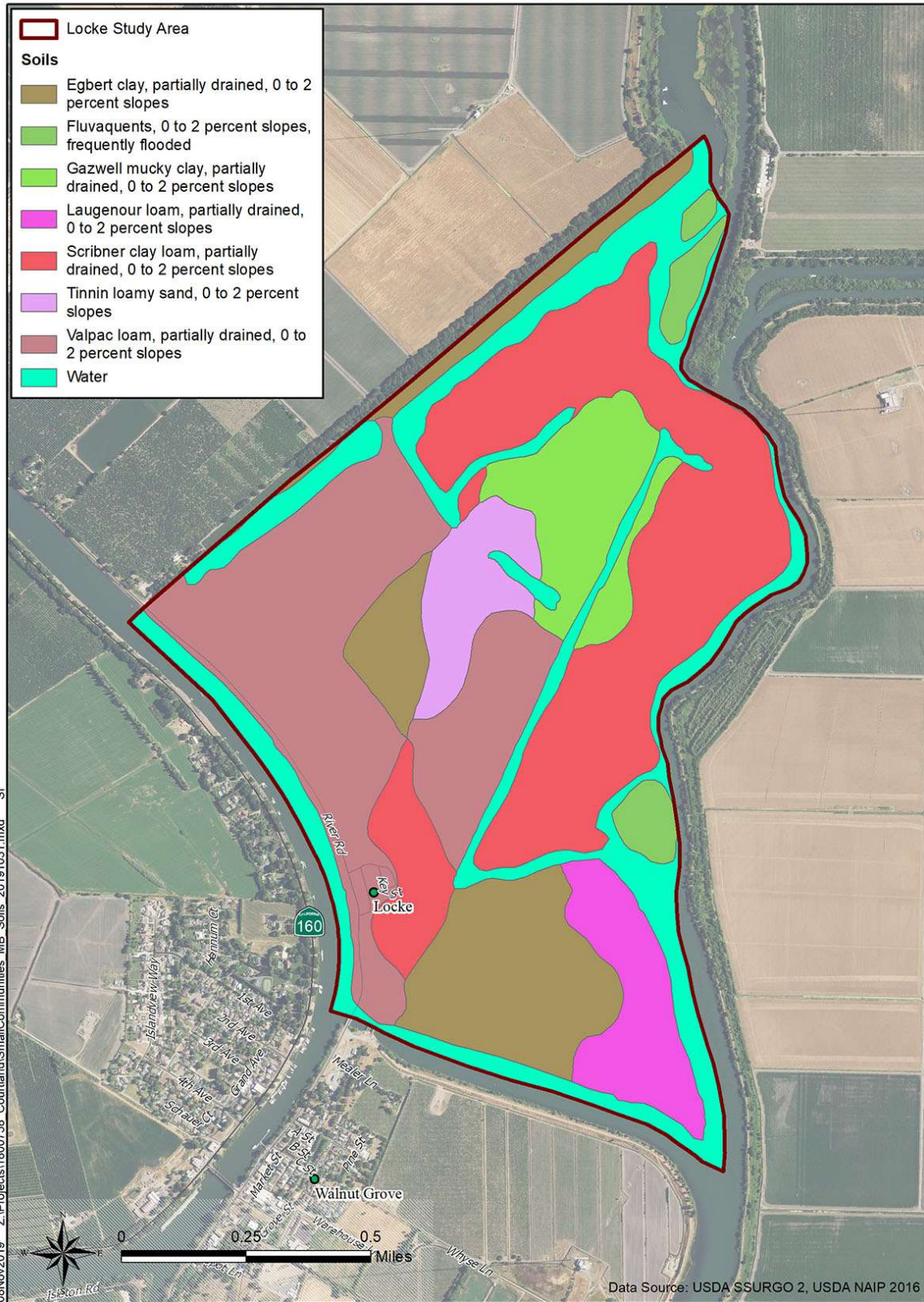
Figure 1. Locke Study Area



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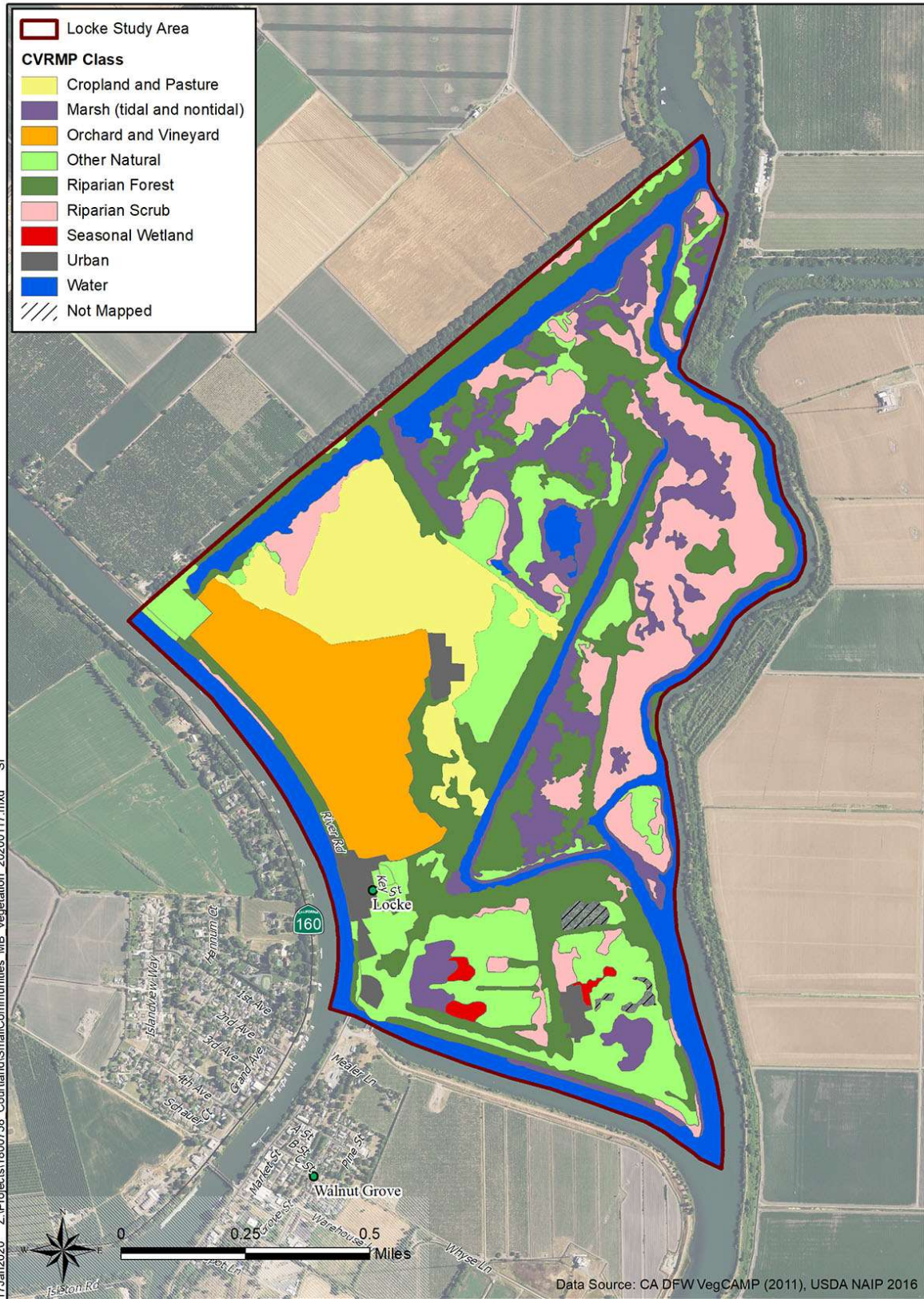
Source: GEI Consultants, Inc., 2019

Figure 2. Community of Locke Soils Map



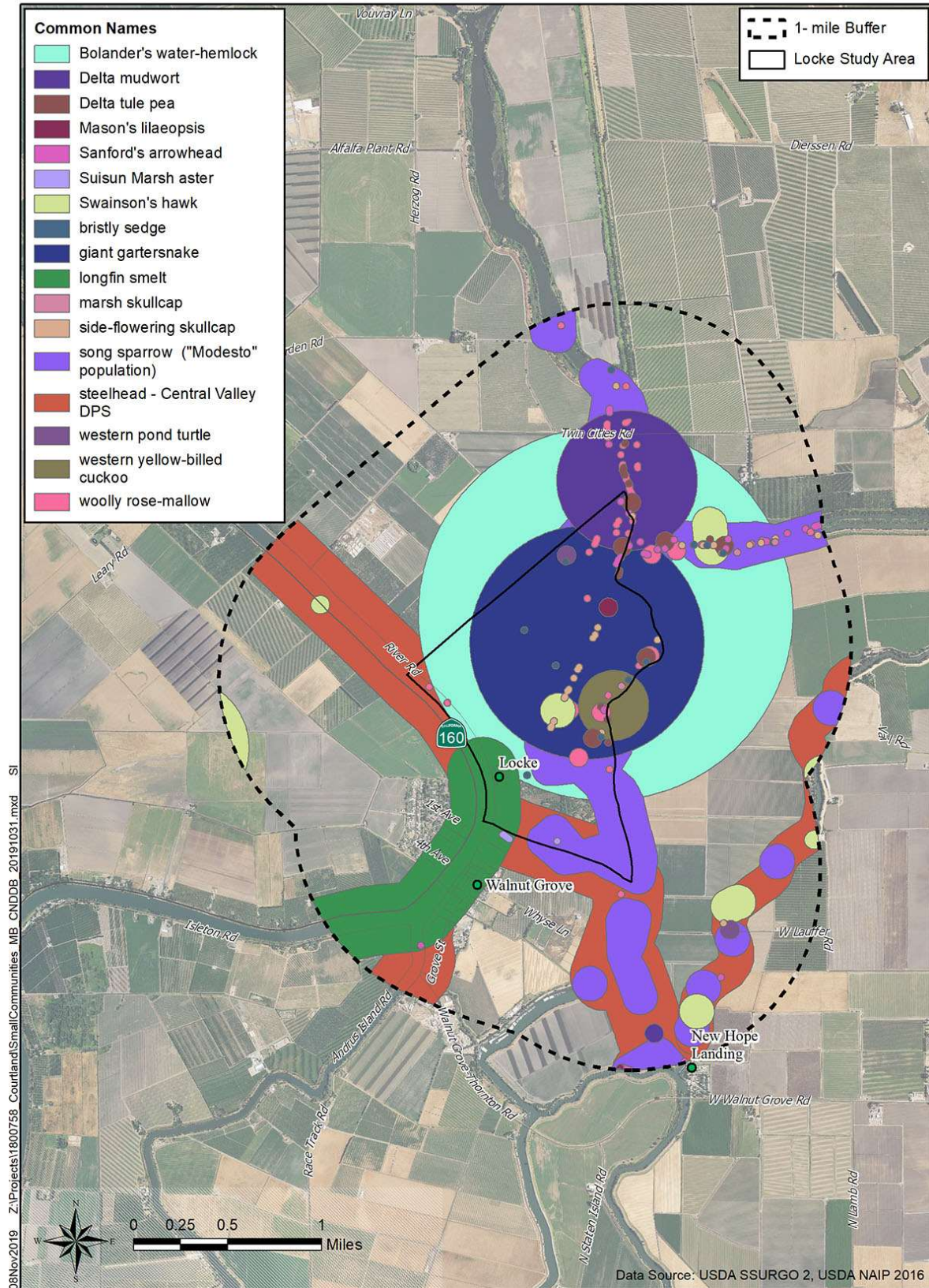
Source: GEI Consultants, Inc., 2019

Figure 3. Community of Locke Vegetation Map



Source: GEI Consultants, Inc., 2019

Figure 4. Locke Special Status Species per CNDDB



Source: GEI Consultants, Inc., 2019

Appendix A. Database Results

Table 1. Special-Status Plant Species Occurrence Potential within the Study Area

Species	Blooming Period	Status ¹			Habitat Associations	Potential for Occurrence in the Study Area
		Federal	State	CRPR		
Large-flowered fiddleneck <i>Amsinkia grandiflora</i>	April–May	FE	–	1B.1	Valley and grassland and foothill woodland; grassy slopes below 300 meters.	Moderate; suitable habitat present in study area.
Watershield <i>Brasenia schreberi</i>	Jun–Sept	–	–	2B.3	Marshes and swamps.	Moderate; suitable habitat present in study area.
Bristly sedge <i>Carex comosa</i>	May–Sept	–	–	2B.1	Coastal prairie; marshes and swamps, valley and foothill grassland.	High; suitable habitat present in study area; CNDDDB occurrences within study area.
Bolander’s water-hemlock <i>Cicuta maculata</i> var. <i>bolanderi</i>	Jul–Sept	–	–	2B.1	Marshes and swamps; Coastal, fresh or brackish water.	High; suitable habitat present in study area; CNDDDB occurrences within study area.
Dwarf downingia <i>Downingia pusilla</i>	Mar–May	–	–	2B.2	Valley and foothill grassland in mesic soils; vernal pools.	Moderate; suitable habitat present in study area.
Jepson’s coyote-thistle <i>Eryngium jepsonii</i>	Apr–Aug	–	–	1B.2	Valley and foothill grassland in moist clay soils; vernal pools.	Moderate; suitable habitat present in study area.
Woolly rose-mallow <i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	June–Sep	–	–	1B.2	Freshwater wetlands, wet banks, marshes below 300 feet; often in riprap on sides of levees.	High; rip rap and other suitable habitat present in the study area; CNDDDB occurrences within study area.
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	May–Sep	–	–	1B.2	Coastal and estuarine marshes, freshwater marsh slopes, and tidal river banks.	High; suitable habitat present in study area; CNDDDB occurrences within study area.
Mason’s lilaeopsis <i>Lilaeopsis masonii</i>	April–Nov	–	–	1B.1	Brackish and freshwater marshes and streambanks; regularly inundated tidal zones, on mud-banks and flat along erosional creek-banks, sloughs, and rivers.	High; suitable habitat present in study area; CNDDDB occurrences within study area.
Delta mudwort <i>Limosella australis</i>	May– Aug	–	–	2B.1	Muddy or sandy intertidal flats, brackish water.	High; suitable habitat present in study area; CNDDDB occurrences within study area.
Baker’s navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	Apr-Jul	–	–	1B.1	Mesic soils; cismontane woodland, meadows and seeps, valley and foothills grassland, vernal pools	Moderate; suitable habitat present in study area.

Table 1. Special-Status Plant Species Occurrence Potential within the Study Area

Species	Blooming Period	Status ¹			Habitat Associations	Potential for Occurrence in the Study Area
		Federal	State	CRPR		
Bearded popcornflower <i>Plagiobothrys hystriculus</i>	April—May	–	–	1B.1	Vernal swales; valley and foothill grassland, vernal pool margins	Moderate; suitable habitat present in study area.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	May—Nov	–	–	1B.2	Slow-moving or standing freshwater ponds, marshes, and ditches.	High; suitable habitat present in survey area; CNDDDB occurrences within study area.
Marsh skullcap <i>Scutellaria galericulata</i>	Jun—Sept	–	–	2B.2	Meadows and seeps, marshes and swamps, lower montane coniferous forest.	High; suitable habitat present in the study area; CNDDDB occurrences within study area.
Side-flowering skullcap <i>Scutellaria lateriflora</i>	July—Sept	–	–	2B.2	Meadows and seeps, marshes and swamps.	High; suitable habitat present in the study area; CNDDDB occurrences within study area.
Suisun Marsh aster <i>Symphotricum lentum</i>	April—Nov	–	–	1B.2	Brackish or freshwater marshes and along streambanks and sloughs.	High; suitable habitat present in study area; CNDDDB occurrences within study area.

¹ Status Definitions

Federal Listing Categories (U.S. Fish and Wildlife Service)

- FT = Threatened
- FE = Endangered
- = No status

State Listing Categories (California Department of Fish and Wildlife)

- ST = Threatened
- SE = Endangered
- = No status

California Rare Plant Ranks

- 1B = Plants rare, threatened, or endangered in California and elsewhere
- 2B = Plants rare, threatened, or endangered in California, but more common elsewhere

Extensions:

- .1 = Seriously threatened in California (>80% of occurrences threatened/high degree and immediacy of threat)
- .2 = Moderately threatened in California (20–80% of occurrences threatened/moderate degree and immediacy of threat)
- .3 = Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats)

Sources: CDFW 2018; CNPS 2018; USFWS 2018; based on data collected and compiled by GEI Consultants, Inc. in 2018

Table 2. Special-Status Wildlife Species with Occurrence Potential in the Study Area

Species	Status ¹		Habitat Associations	Potential for Occurrence in the Study Area
	Federal	State		
Invertebrates				
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T	–	Closely associated with elderberry, which is an obligate host for the beetle larvae.	Low; elderberry shrubs were not observed in and adjacent to the study area.
Delta green ground beetle <i>Elaphrus viridis</i>	T	–	Open habitats in grassland-playa pool matrix, along edges of pools, trails, roads and ditches.	Low; suitable habitat is present in the study area; however, habitat conditions are poor.
Fish				
Green Sturgeon—southern DPS <i>Acipenser medirostris</i>	T	--	Anadromous; Estuaries and bays; spawn in deep pools or “holes” in large, turbulent, freshwater river mainstems.	High; suitable habitat present in and adjacent to the study area.
Sacramento perch <i>Archoplites interruptus</i>	--	SSC	Heavily vegetated water of slough and lakes throughout the Central Valley	High, suitable habitat present in and adjacent to the study area.
Delta smelt <i>Hypomesus transpacificus</i>	T	E	Semi-anadromous; typically restricted to the Delta and the lower Sacramento River downstream of Isleton	Low; study area approximately 13 miles upstream of Isleton.
California Central Valley DPS Steelhead <i>Oncorhynchus mykiss irideus</i> pop. 11	T	–	Anadromous; typically found in the Sacramento-San Joaquin Delta.	High, suitable habitat present in and adjacent to the study area.
Chinook Salmon— Sacramento River winter–run ESU <i>(Oncorhynchus tshawytscha)</i>	E	--	Anadromous; typically found in deep, large streams.	High; suitable habitat present in and adjacent to the study area.
Chinook Salmon—Central Valley spring–run ESU ESU <i>(Oncorhynchus tshawytscha)</i>	T	–	Anadromous; typically found in deep, large streams.	High; suitable habitat present in and adjacent to the study area.
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	–	SSC	Backwaters and pools of rivers, lakes, slow-moving waters and slough of main rivers and Delta.	High; suitable habitat present in and adjacent to the study area.

Table 2. Special-Status Wildlife Species with Occurrence Potential in the Study Area

Species	Status ¹		Habitat Associations	Potential for Occurrence in the Study Area
	Federal	State		
Longfin smelt <i>Spirinchus thaleichthys</i>	–	T	Anadromous; typically found in the San Francisco Estuary and the Sacramento-San Joaquin Delta.	High; suitable habitat present in and adjacent to the study area.
Reptiles				
Western pond turtle <i>Emys marmorata</i>	–	SSC	Permanent or nearly permanent water bodies in various habitats, including ponds, marshes, rivers, streams, and ditches.	High; study area provides suitable aquatic habitat and upland areas; CNDDDB occurrence within study area.
Giant garter snake <i>Thamnophis gigas</i>	T	T	Open water and emergent vegetation in marshes, sloughs, and other aquatic habitats; also requires open upland habitat for basking and underground refuge.	High; aquatic habitat and upland areas present in the study area; CNDDDB occurrence within study area.
Birds				
Tricolored blackbird <i>Agelaius tricolor</i>	–	SSC	Nests and forages in wetlands with cattails, bulrushes, and willows, and occasionally agricultural fields.	Moderate; suitable habitat present in and adjacent to the study area, but no nesting colonies in the vicinity.
Grasshopper sparrow <i>Ammodramus savannarum</i>	–	SSC	Open grasslands and prairies with patchy shrub cover.	Moderate; potentially suitable habitat is present in the study area.
Burrowing owl <i>Athene cunicularia</i>	–	SSC	Nests and forages in grasslands, agricultural lands, open shrublands, and open woodlands with natural or artificial burrows or friable soils.	Moderate; potentially suitable habitat is present in the study area.
Swainson's hawk <i>Buteo swainsoni</i>	–	T	Nests in riparian forest and scattered trees; forages in grasslands and agricultural fields.	High; scattered trees adjacent to study area provides suitable nest habitat, agriculture in the survey area provide foraging habitat; CNDDDB occurrences within study area.
Northern harrier <i>Circus cyaneus</i>	–	SSC	Nests and forages in grasslands, agricultural fields, and marshes; nests on the ground in patches of dense, often tall, vegetation in undisturbed areas.	Moderate; grasslands and marsh habitat in undeveloped portions of the study area provide suitable foraging yet marginal nesting habitat.

Table 2. Special-Status Wildlife Species with Occurrence Potential in the Study Area

Species	Status ¹		Habitat Associations	Potential for Occurrence in the Study Area
	Federal	State		
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	T	E	Wooded riparian habitat with dense cover and water nearby; dense thickets along streams and marshes.	Low; suitable foraging habitat for migrant individuals is present adjacent to the survey area, but the area is outside the current breeding range of the species.
White-tailed kite <i>Elanus leucurus</i>	–	FP	Savanna, open woodland, marshes, and cultivated fields. Nests in isolated trees, or at edge of forest.	High; potentially suitable habitat is present adjacent to the survey area.
American peregrine falcon <i>Falco peregrinus anatum</i>	–	FP	Open country near water where shorebirds feed. May nest in high cliffs near rivers, wetlands, lakes, and human-made structures; forages in grasslands, open woodland, and agricultural areas.	High; river and human-made structures on and adjacent to the survey area provide suitable nesting and foraging habitat.
California black rail <i>Laterallus jamaicensis coturniculus</i>	–	T	Wet meadows and shallow freshwater to saltwater marshes with dense vegetation.	Moderate; potentially suitable habitat is present adjacent to the survey area.
Modesto Song sparrow <i>Melospiza melodia</i>	–	SSC	Nests and forages in dense vegetation in marsh, riparian forest and scrub, and along irrigation and drainage canals.	High; potentially suitable habitat is present on and adjacent to the survey area; CNDDDB occurrences within survey area.
Bank swallow <i>Riparia riparia</i>	–	T	Burrow in sandy, vertical bluff or riverbanks, streams, coastal bluff and sand and gravel pits.	Moderate; suitable habitat is present in or adjacent to the survey area.
Mammals				
Western red bat <i>Lasiurus blossevillii</i>	–	SSC	Roosts in broad leaved trees, especially cottonwood and willows from sea level up through foothills and lower mountains. Forages in grasslands, shrublands, open woodland and forests, and croplands.	Moderate; suitable roosting habitat in and adjacent to the survey area.
Mexican free-tailed bat <i>Tadarida brasiliensis</i>	–	SSC	Roosts in caves, in structures such as ceiling or walls, hollows of trees, and beneath fronds of palm trees.	Moderate; suitable roosting habitat in and adjacent to the survey area.

Table 2. Special-Status Wildlife Species with Occurrence Potential in the Study Area

Species	Status ¹		Habitat Associations	Potential for Occurrence in the Study Area
	Federal	State		
Riparian brush rabbit <i>Sylvilagus bachmani riparius</i>	E	E	Riparian thickets of willows, wild rose bushes, blackberry, coyote bushes and wild grape vines.	Moderate; potentially suitable habitat is present on and adjacent to the survey area.
American badger <i>Taxidea taxus</i>	–	SSC	Grasslands, shrublands, and other open habitats.	Moderate; potentially suitable habitat is present on and adjacent to the survey area.

Notes: CDFW = California Department of Fish and Wildlife; CNDDDB = California Natural Diversity Database; ESU = NMFS = National Marine Fisheries Service; USFWS = U.S. Fish and Wildlife Service

¹ Status Definitions:

Federal Listing Categories (NMFS/USFWS)

- T = Threatened
- E = Endangered
- SC = Species of concern
- = No status

State Listing Categories (CDFW)

- T = Threatened
- E = Endangered
- R = Rare
- SSC = Species of special concern
- FP = Fully Protected
- = No status

CDFW California Rare Plant Ranks

- 1B = Plants rare, threatened, or endangered in California and elsewhere
- 2B = Plants rare, threatened, or endangered in California, but more common elsewhere

Extensions:

- .1 = Seriously endangered in California (>80% of occurrences are threatened and/or high degree and immediacy of threat)
- .2 = Fairly endangered in California (20–80% of occurrences are threatened)

Sources: CDFW 2018; CNPS 2018; USFWS 2018; based on data collected and compiled by GEI in 2018.