

Memo

To: George Booth – Sacramento County
From: Lynn Hermansen and Eric Htain
Date: January 23, 2020
cc: Jeffrey Twitchell
Re: Biological Resources Constraints Assessment for the Communities of West Walnut Grove and Ryde – Grand Island
Small Communities Flood Risk Reduction Feasibility Study
Sacramento County, CA
GEI Project 1800783

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 Courtland 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 West Walnut Grove study area is located in Sacramento County, California, along the west bank of the Sacramento River and east bank of Steamboat Slough (**Figure 1**). The study area includes areas covered by Reclamation District 3 (Grand Island). The southern tip of the study area is federally owned and serves as a dredge disposal site for maintenance of the Port of Sacramento Deep Water Ship Channel. There are 28.77 miles of levees including 11.43 miles along Steamboat Slough and 17.34 miles along Sacramento river. In addition, there are 37.23 miles of canals and ditches that provide drainage to the property owners. There are two State Highways in the study area, including CA-160 running along the east levee along Sacramento River and CA- 220 running east to west bisecting the island at Ryde. There are also paved county roads on the west levee along Steamboat Slough, the Sacramento River levee downstream of the Isleton bridge, and other county and private roads within the interior.

Land use supports urban and residential development, and agriculture. Urban and residential development is situated mainly in the town of Ryde. There are several commercial and industrial, and historical properties including the Grand Island mansion and the Ryde Hotel. Residential units and several recreational facilities are also located within the study area. but several residential and commercial properties are located along CA-160. Agriculture supports vineyard and pear orchard.

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 Isleton U.S Geological Survey 7.5-minute quadrangle, within which the study area is located, and the eight surrounding quadrangles: Courtland, Liberty Island, Isleton, Bruceville, Terminous, Thornton, Bouldin Island, Jersey Island, 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**.

In 2012, RD 3 developed a Five-Year Plan (Plan) to outline an anticipated repair and improvements schedule for flood protection around the study area (MBK 2012). The Plan provides, among other things, assessments of the existing levee systems of the districts and identification of opportunities for multi-objective projects. Part of the identification of multi-objective projects is the consideration of ecosystem restoration and habitat enhancement activities. In order to conduct these evaluations of ecosystem restoration and habitat enhancement opportunities, habitat assessments to determine the existing habitat conditions.

A habitat assessment was prepared for the Plan by Kjeldsen Biological Consulting in 1998. The habitat assessment describes the wildlife habitat and vegetation resources observed along the levee that could potentially be impacted by the RD's levee maintenance work program and future regularly scheduled maintenance programs. The assessments and mapping were restricted to the area on and immediately adjacent to the levees and therefore captured primarily riparian, shrub scrub, and some wetland habitat types.

GEI reviewed the Plan and additional existing databases, documents, and maps to establish an environmental baseline condition for the entire West Walnut Grove 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 presented in the Plan and update or revise the information if necessary. 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 West Walnut Grove study area.

Biological Resources

Elevations in the study area vary from approximately -16 to 30 feet national geodetic vertical datum (NGVD), with the highest elevations located on the non-project levee along Sacramento River and lowest elevations in the interior of agricultural land.

According to the Natural Resource Conservation Service, four soil types intersect the study area boundary (**Figure 2**). All soils are typically associated with floodplain alluvial processes and are primarily of silty clay loam in texture. Soil types include gazwell mucky clay, the Sailboat series, egbert clay, scribner clay loam, laugenour loam, consumnes silt loam, xeropsamments, columbia fine sandy loam, dumps, and fluvaquents.

According to the NWI database, riverine, freshwater forest/shrub wetland, freshwater emergent wetland, and palustrine farmed features are found in the study area. The Sacramento River is located adjacent to the eastern boundary of the study area and converges with Steamboat Slough and Cache Slough at the southwestern most tip of the study area. Steamboat Slough situated on the entire western boundary of the study area. Irrigation ditches throughout the interior of the study area, among parcels of agricultural land, provides drainage to the property owners, but the water is removed at a pumping plant before entering waterways.

Vegetation Communities

Vegetation classifications include a crosswalk between Central Valley Riparian Mapping Project (CVRMP) and the U. S. 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 communities in the study area (**Figure 3**).

Cropland and Pasture

Cropland and pasture dominates the landscape including alfalfa (*Medicago sativa*), grain, tomatoes, and other miscellaneous row crops. There is also a significant amount of irrigated pasture for cattle and goats.

Orchard and Vineyard

Agricultural land also includes orchard and vineyard such as pear (*Pyrus communis*) and grape (*Vitis* spp.).

Other Natural

Other natural vegetation is found along waterways and drainages, and includes annual grasses such as Bermuda grass (*Cynodon dactylon*), johnsongrass (*Sorghum haepense*) and rip-gut brome (*Bromus diandrus*), native trees and shrubs, forbs such as sweet fennel, (*Foeniculum vulgare*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), poison-hemlock (*Conium maculatum*), milk thistle (*Silybum marianum*), and other natural trees such as eucalyptus (*Eucalyptus* spp.) and Mexican fan palm (*Washingtonia robusta*).

Riparian Forest

Riparian forest vegetation is sparse and was identified primarily along the waterside of the levee. Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), boxelder (*Acer negundo*), and black willow (*Salix gooddingii*), are the dominant species in this habitat.

Riparian Scrub

Narrow patches of riparian scrub were identified along drainages and in small patches throughout the study area. Riparian scrub vegetation includes native species such as sandbar willow (*Salix exigua*), California mugwort (*Artemisia douglasiana*) and common buttonbush (*Cephalanthus occidentalis*), and nonnative species such as Himalayan blackberry (*Rubus armeniacus*) and giant reed (*Arundo donax*). Intermixed within patches of riparian scrub also includes hydrophytic vegetation such as scouringrush horsetail (*Equisetum hyemale*) and common rush (*Juncus effusus*).

Marsh

Linear patches of tidal and non-tidal marsh are present along drainages. Freshwater emergent vegetation such as hardstem bulrush (*Schoenoplectur acutus*), broadleaf cattail (*Typha latifolia*), and non-native Himalayan blackberry dominate marsh habitat.

Urban

Urban landscape areas within the study area includes ground covered by residential lawns, ornamental plantings, and small structures (e.g., retaining walls, planters, stairs, boat docks) along the levee landside. These areas are characterized by a mix of ornamental and native species.

Aquatic

The Sacramento River, Steamboat Slough, and Cache Slough are the major 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 CNDDDB occurrences and other biological data resources show 14 special-status plant species and 34 special-status wildlife species that are documented or have potential to occur in the study area (**Table 1 and 2**). **Figure 4** depicts CNDDDB occurrences of special-status plant and wildlife species within 1 mile of the study area.

Five species, woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*), delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), Sanford's arrowhead (*Sagittaria sanfordii*), and Suisun Marsh aster (*Symphotricum lentum*), have a high potential to occur, with CNDDDB occurrences in the study area. There are 8 additional special-status plant species with moderate potential to occur in the study area (**Table 2**). 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 are Swainson's hawk (*Buteo swainsoni*), American peregrine falcon (*Falco peregrinus anatum*), Modesto song sparrow (*Melospiza melodia*), western red bat (*Lasiurus blossevillii*), and Mexican free-tailed bat (*Tadarida brasiliensis*). An additional seven special-status wildlife species have a moderate potential to occur in the vicinity (**Table 2**).

Designated USFWS and NMFS critical habitat and Essential Fish Habitat (EFH) occur within the Sacramento River and border the study area. Critical habitat for five species is present in the study area: green sturgeon DPS, Delta smelt, California Central Valley DPS steelhead, Sacramento River chinook salmon, Central Valley chinook salmon. 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. 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 five special-status plant species. The study area also has the potential to support 8 additional special-status plant species and 12 special-status wildlife species. In addition, the Sacramento River, Steamboat Slough, and Cache 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

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- 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

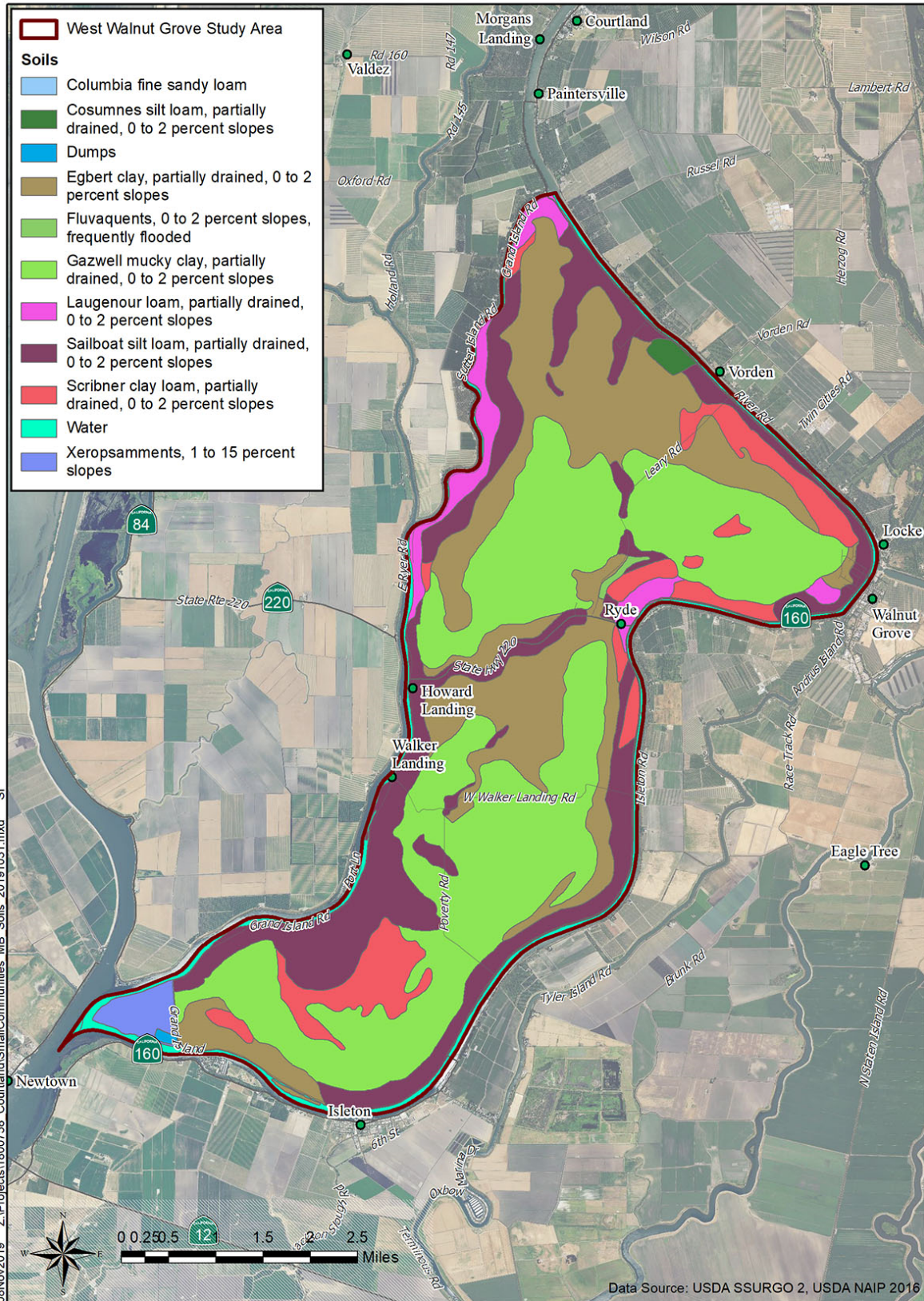
Figure 1. West Walnut Grove Study Area



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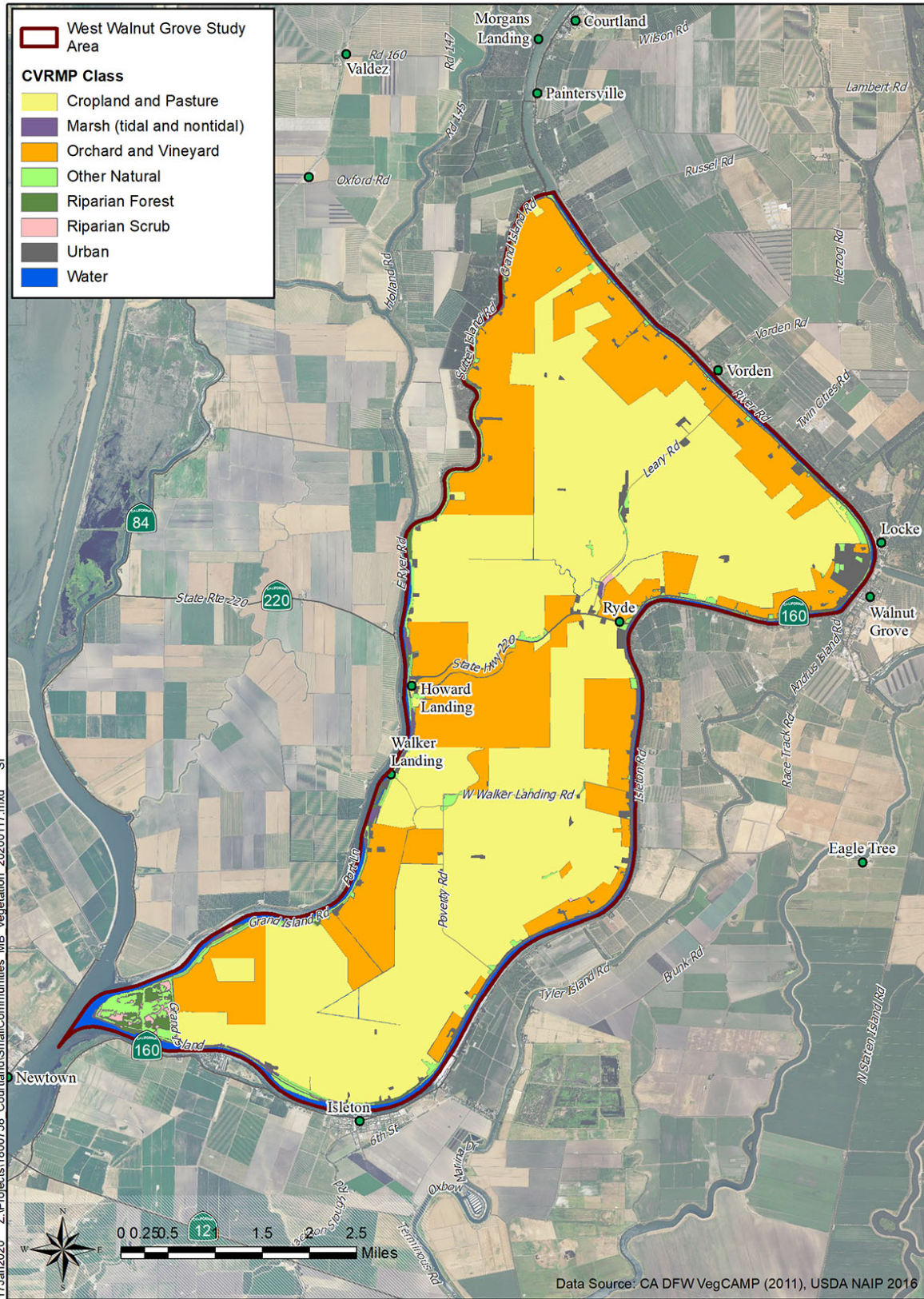
Source: GEI Consultants, Inc., 2019

Figure 2. Community of West Walnut Grove Soils Map



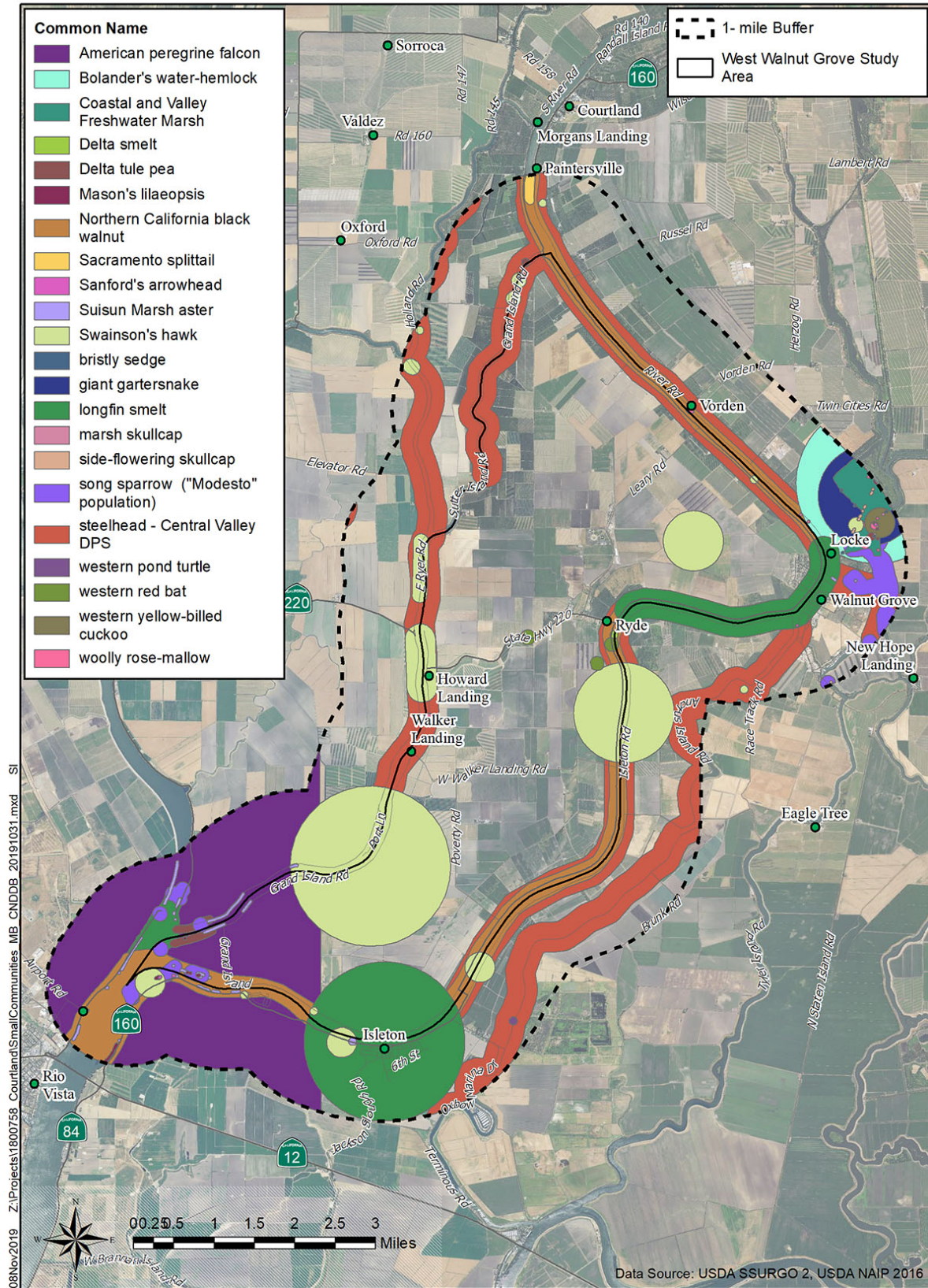
Source: GEI Consultants, Inc., 2019

Figure 3. Community of West Walnut Grove Vegetation Map



Source: GEI Consultants, Inc., 2019

Figure 4. West Walnut Grove 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 adjacent to study area.
Watershield <i>Brasenia schreberi</i>	Jun–Sept	–	–	2B.3	Marshes and swamps.	Moderate; suitable habitat adjacent to study area.
Bristly sedge <i>Carex comosa</i>	May–Sept	–	–	2B.1	Coastal prairie; marshes and swamps, valley and foothill grassland.	Moderate; suitable habitat adjacent to study area.
Soft bird's-beak <i>Chloropyron molle</i> ssp. <i>molle</i>	Jun–Nov	–	–	1B.2	Marshes and swamps (coastal salt)	Low; suitable habitat adjacent to study area; however, suitable soil lacking in 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.	Moderate; suitable habitat adjacent to 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 occurrence 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 occurrence 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.	Moderate; suitable habitat present in study area.
Eel-grass pondweed <i>Potamogeton zosteriformis</i>	Jun–Jul	–	–	2B.2	Freshwater and brackish marshes and swamps.	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 study area; CNDDDB occurrences within 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		
Marsh skullcap <i>Scutellaria galericulata</i>	Jun—Sept	–	–	2B.2	Meadows and seeps, marshes and swamps, lower montane coniferous forest.	Moderate; suitable habitat present in the study area.
Side-flowering skullcap <i>Scutellaria lateriflora</i>	July—Sept	–	–	2B.2	Meadows and seeps, marshes and swamps.	Moderate; suitable habitat present in the 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 the 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 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.	High; suitable habitat present in and adjacent to the study area.
California Central Valley DPS Steelhead <i>Oncorhynchus mykiss irideus</i>	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 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.	Moderate; study area provides suitable aquatic habitat and upland areas.
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.	Low; marginally suitable habitat present in the 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.
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 survey area provides suitable nest habitat, agriculture in the survey area provide foraging habitat and suitable nest sites; known 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 and adjacent to undeveloped portions of the study area provide suitable foraging yet marginal nesting habitat.
White-tailed kite <i>Elanus leucurus</i>	–	FP	Savanna, open woodland, marshes, and cultivated fields. Nests in isolated trees, or at edge of forest.	Moderate; potentially suitable habitat is present in the study area.

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

Species	Status ¹		Habitat Associations	Potential for Occurrence in the Study Area
	Federal	State		
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 study area provide suitable nesting and foraging habitat; CNDDDB occurrence within study area.
California black rail <i>Laterallus jamaicensis coturniculus</i>	–	T	Wet meadows and shallow freshwater to saltwater marshes with dense vegetation.	Low; potentially suitable habitat is present adjacent to the study 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 study area; CNDDDB occurrences within study 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.	High; suitable roosting habitat in and adjacent to the study area; multiple CNDDDB occurrences within study 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.	High; suitable roosting habitat in and adjacent to the study area.
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; suitable habitat present in the study area.
American badger <i>Taxidea taxus</i>	–	SSC	Grasslands, shrublands, and other open habitats.	Moderate; suitable habitat present adjacent to the study 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

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

Species	Status ¹		Habitat Associations	Potential for Occurrence in the Study Area
	Federal	State		
SC =	Species of concern			
- =	No status			
<u>State Listing Categories (CDFW)</u>				
T =	Threatened			
E =	Endangered			
R =	Rare			
SSC =	Species of special concern			
FP =	Fully Protected			
- =	No status			
<u>CDFW California Rare Plant Ranks</u>				
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.				