

Memo



To: Charles Bergson, City Manager – City of Isleton
From: Lynn Hermansen and Eric Htain
cc: Jeffrey Twitchell
Date: January 23, 2020
Re: Biological Resources Constraints Assessment for the City of Isleton
Small Communities Flood Risk Reduction Feasibility Study
Sacramento County, CA
GEI Project 1800488

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 Isleton study area is located on Brannan-Andrus Island in Sacramento County, California. The study area is covered by the Brannan-Andrus Levee Maintenance District (BALMD). The study area is bordered by 26.2 miles of levee along the Sacramento River, Georgiana Slough, Mokelumne River, San Joaquin River, and Sevenmile Slough. (**Figure 1**). Major roadways in the study area include River Road (CA-160) located on the east bank of the Sacramento River, Highway 12 bisecting the study area, and Jackson Slough Road bisecting the northern portion of the study area.

Land use supports urban and residential development, and agricultural areas. A large contingent of recreational features are the Delta resorts, including RV parks, boat launches, and marinas for local and public use, located along the Mokelumne, San Joaquin River and Sevenmile Slough. The historic town of Isleton is the largest urban area, with close to 900 residents, situated along the Sacramento River. Corn and alfalfa are the primary crops, but other agricultural uses include orchards (i.e., pears, apples, and cherries), vineyards, row crops (i.e., wheat and safflower), and pasture.

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: Bruceville, Liberty Island, Courtland, Jersey Island,

Bouldin Island, 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**.

In 2012, the Brannan-Andrus Levee Maintenance District (BALMD) developed a Five-Year Plan (Plan) to outline an anticipated repair and improvements schedule for flood protection around the study area (DCC 2012). The Plan provide, 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 the California Department of Fish and Wildlife in 2007 for RD 3. The habitat assessment included a baseline of habitat values on and around the levees and mapping of habitat types in the same area. The assessment 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 Isleton 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 Isleton study area.

Biological Resources

Elevations in the study area vary from approximately -22 to 9 feet North American Vertical Datum of 1998 (NAVD88), with the highest elevations along River Road and lowest elevation in the interior of agricultural land.

According to the Natural Resource Conservation Service, eight 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 gazwell mucky clay, rindge mucky silt loam, scribner clay loam, laugenour loam, columbia silt loam, valpac, and xeropsamments.

According to the NWI database, riverine, freshwater forest/shrub wetland, freshwater pond, and palustrine farmed features are found in the study area. The Sacramento River is the primary aquatic feature and is located adjacent to the northern boundary and western boundary of the study area. Georgiana Slough is adjacent to the eastern boundary of the study area before flowing southward into the Mokelumne River at the southeastern boundary before joining the San Joaquin River at the most southeastern tip of the study area. Sevenmile Slough follows a majority of the southern boundary of the study area immediately west of the San Joaquin River and Mokelumne River confluence. Two smaller aquatic features, Tomato Slough and Jackson Slough, which did not contain water during the time of the 2018 survey, drain the interior of the study area into Sevenmile Slough. Irrigation ditches

throughout the interior of the study area, among parcels of agricultural land, provide 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 nine vegetation communities in the study area (**Figure 3**).

Cropland and Pasture

Within the interior of study area, cropland and pasture dominates the landscape including corn (*Zea mays*), alfalfa (*Medicago sativa*), other miscellaneous row crops, and grazing land for livestock.

Orchard and Vineyard

Landside vegetation adjacent to the levee is the agricultural landscape is typically orchard and vineyard, including pear (*Pyrus communis*) and grape (*Vitis* spp.).

Other Natural

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

Riparian Forest

Riparian forest vegetation is sparse and was identified primarily along Tomato Slough. 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.

Riparian Scrub

Narrow patches of riparian scrub were identified along drainages and in small patches throughout the study area. Riparian scrub vegetation includes 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

Small linear patches of tidal and non-tidal marsh can be found along drainages. Freshwater emergent vegetation such as hardstem bulrush (*Schoenoplectur acutus*) and broadleaf cattail (*Typha latifolia*) and non-native Himalayan blackberry (*Rubus armeniacus*) dominate marsh habitat.

Seasonal Wetland

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

Urban

Urban landscape areas within the study area includes ground covered by backyard 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, Georgiana Slough, Mokelumne River, and the San Joaquin River 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 the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB) occurrences and other biological data resources show 14 special-status plant species and 25 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.

Six flora species, Bolander's water-hemlock (*Cicuta maculata* var. *bolanderi*), delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), Delta mudwort (*Limosella australis*), Sanford's arrowhead (*Sagittaria sanfordii*), and Suisun Marsh aster (*Symphotricum lentum*), have a high potential to occur, with CNDDDB occurrences in the study area (**Table 1**). There are 7 additional special-status plant species with moderate potential to occur in the vicinity.

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*), western pond turtle (*Emys marmorata*), American peregrine falcon (*Falco peregrinus anatum*), Modesto song sparrow (*Melospiza melodia*), and western red bat (*Lasirusu blossevillii*). An additional six 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, Georgiana Slough, Mokelumne River, and San Joaquin River and border the study area.

Critical habitat for five 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, seasonal wetland, 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 six special-status plant species. The study area also has the potential to support 7 additional special-status plant species and 11 special-status wildlife species. In addition, the Sacramento River, Georgiana Slough, Mokelumne River, and San Joaquin River 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:

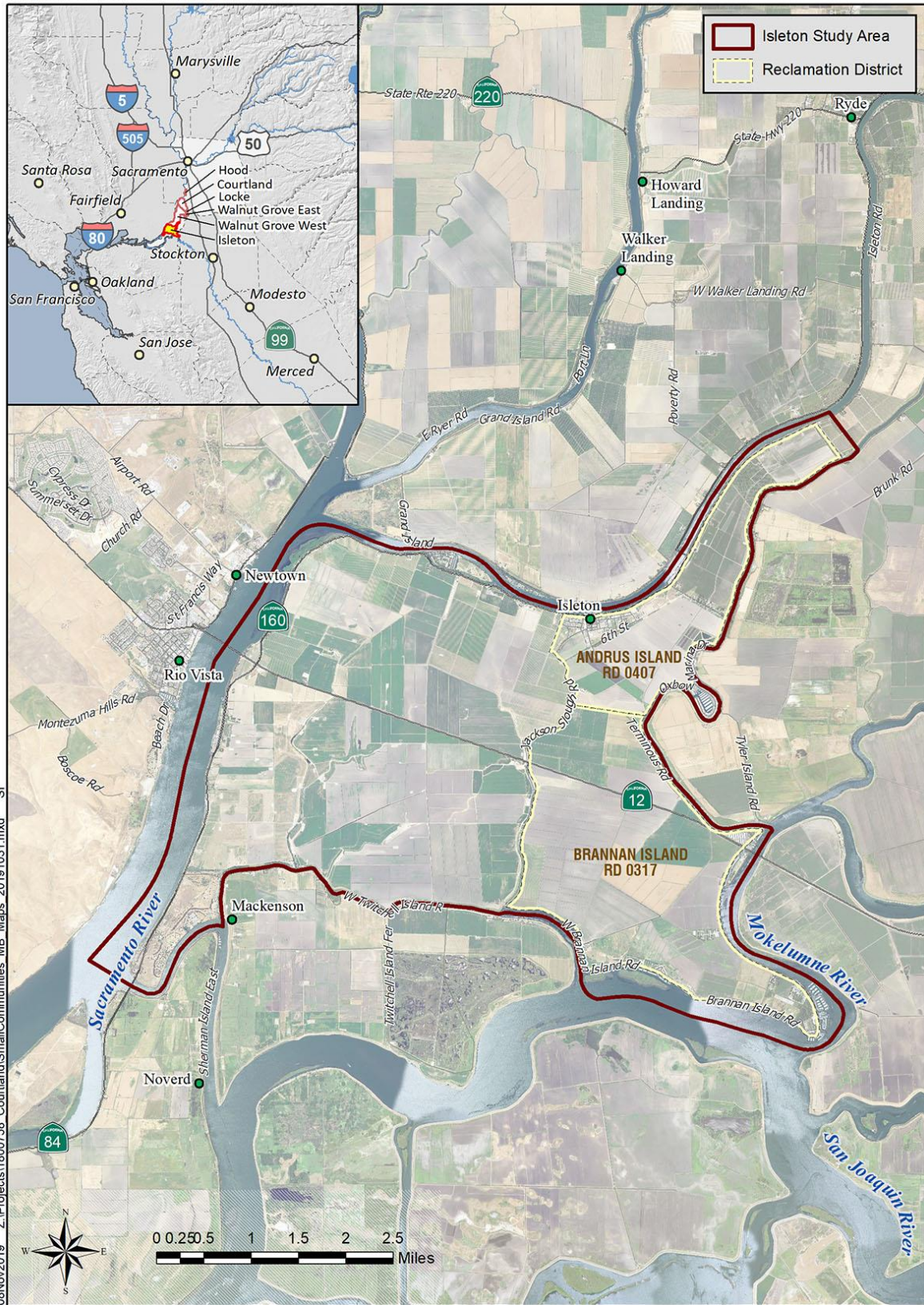
- A wetland delineation of the study area, in accordance with the 1987 USACE Wetland Delineation Manual and Sacramento District standards; and
- Focused habitat classification and assessments to determine the potential impacts of the project on special-status species.

References

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- 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

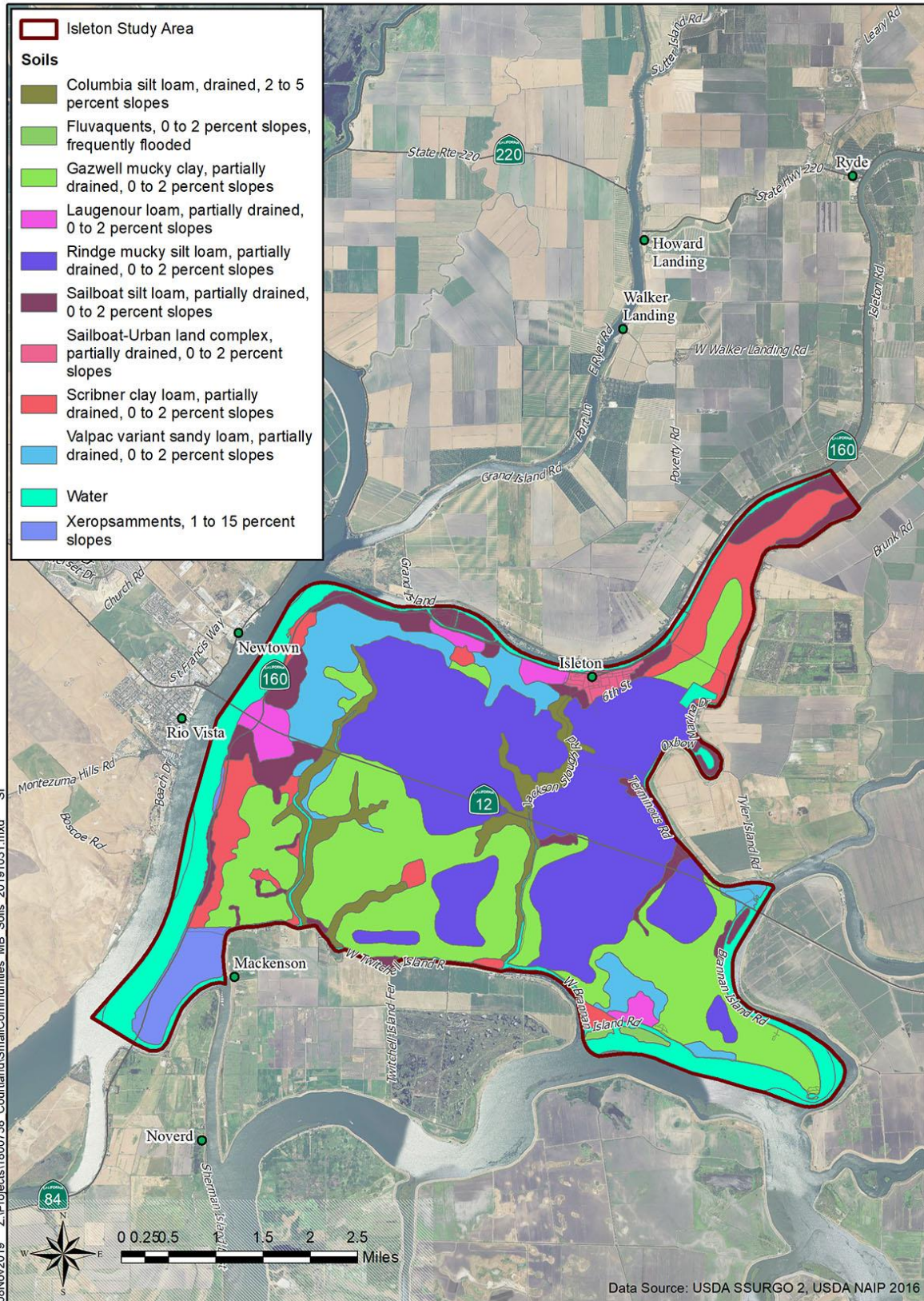
Figure 1. Isleton Study Area



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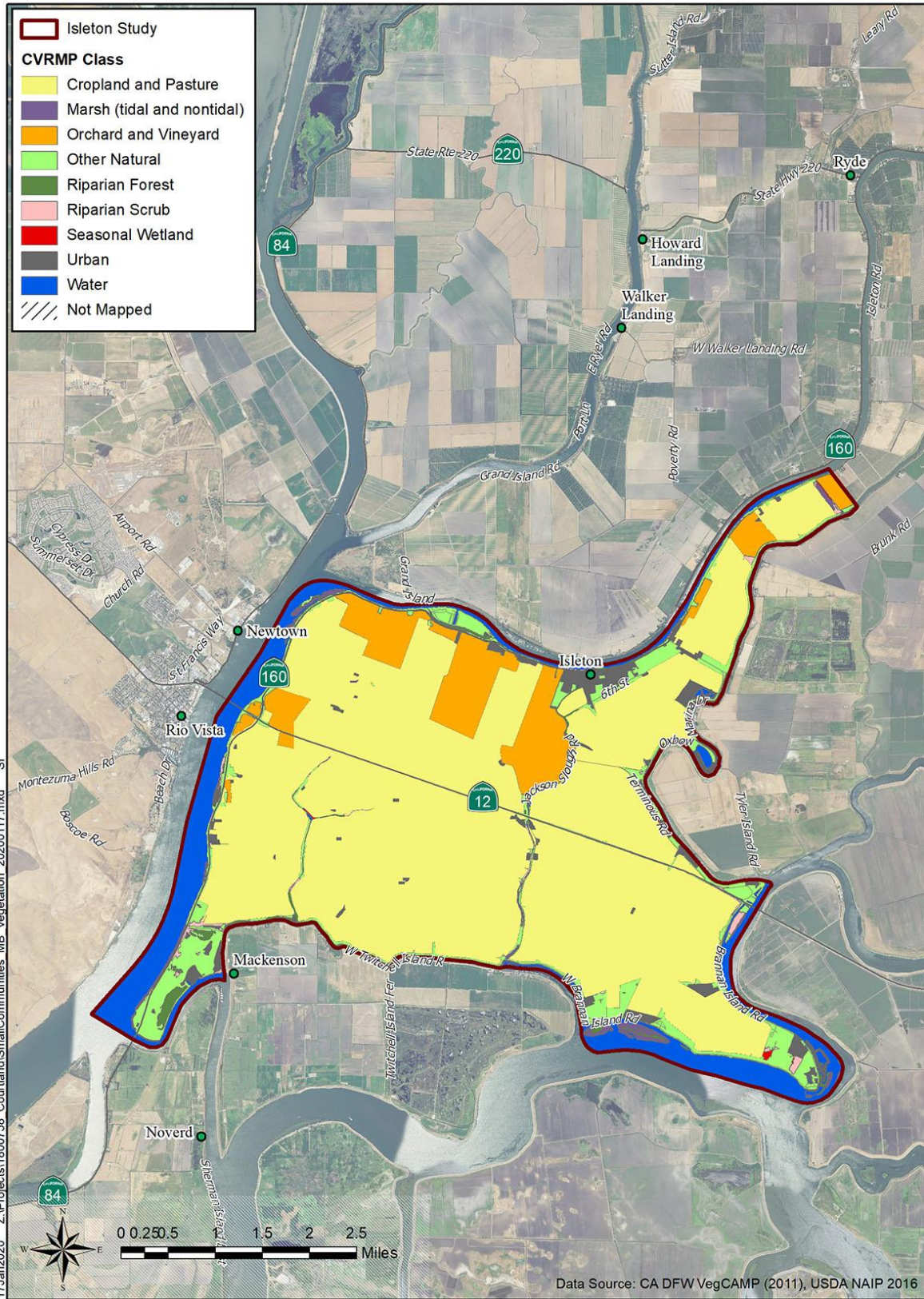
Source: GEI Consultants, Inc., 2019

Figure 2. Community of Isleton Soils Map



Source: GEI Consultants, Inc., 2019

Figure 3. Community of Isleton Vegetation Map



Source: GEI Consultants, Inc., 2019

Appendix A. Database Results

Table 1. Special-Status Plant Species with 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 the 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 adjacent to study area; CNDDDB occurrences within study area.
Soft bird’s-beak <i>Chloropyron molle</i> ssp. <i>molle</i>	Jun–Nov	–	–	1B.2	Marshes and swamps; saline soil.	Low; suitable habitat adjacent to study area; however, marginally suitable soil 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.	High; suitable habitat adjacent to study area; CNDDDB occurrences within 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.	Moderate; suitable habitat present in survey area.
Mason’s lilaeopsis <i>Lillaeopsis masonii</i>	April–Nov	–	–	1B.1	Brackish and freshwater marshes and streams; regularly inundated tidal zones, mud-banks along erosional creek-banks, sloughs, and rivers.	High; suitable habitat present in survey area; CNDDDB occurrences within survey area.
Delta mudwort <i>Limosella australis</i>	May– Aug	–	–	2B.1	Muddy or sandy intertidal flats, brackish water.	High; suitable habitat present in survey area; CNDDDB occurrences within survey area.
Eel-grass pondweed <i>Potamogeton zosteriformis</i>	Jun–Jul	–	–	2B.2	Freshwater and brackish marshes and swamps.	Moderate; suitable habitat present in survey 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 survey area.

Table 1. Special-Status Plant Species with 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 survey area.
Side-flowering skullcap <i>Scutellaria lateriflora</i>	July—Sept	–	–	2B.2	Meadows and seeps, marshes and swamps.	Moderate; suitable habitat present in the survey area.
Suisun Marsh aster <i>Symphotricum lentum</i>	April—Nov	–	–	1B.2	Brackish or freshwater marshes and along streambanks and sloughs.	Moderate; suitable habitat present in survey 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 survey 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 survey 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 survey 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 survey 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 survey area.
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 survey 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 survey area.
Chinook Salmon—Central Valley spring–run ESU (<i>Oncorhynchus tshawytscha</i>)	T	–	Anadromous; typically found in deep, large streams.	High; suitable habitat present in and adjacent to the survey 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 survey 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 survey 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; survey area provides suitable aquatic habitat and upland areas; multiple CNDDB occurrences within survey 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.	Low; suitable habitat present in the survey area; however, no suitable upland habitat is present along the survey 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 survey 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.	High; suitable habitat is present on and adjacent to the survey area; CNDDB occurrences within survey 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 CNDDB occurrences within survey 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 survey area provide suitable foraging yet marginal nesting habitat.

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		
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; marginal quality 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.	Moderate; 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; CNDDDB occurrence within survey area.
Saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	–	SSC	Fresh to saltwater marsh and riparian woodland and swamp.	Low; potential habitat adjacent to the survey area, but the recognized range of this subspecies does not extend east into the Delta.
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 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.	Moderate; potentially suitable habitat is present on and adjacent to the survey area; CNDDDB occurrences within 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.	High; suitable roosting habitat in and adjacent to the survey area; CNDDDB occurrence within survey 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		
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 survey area.
American badger <i>Taxidea taxus</i>	–	SSC	Grasslands, shrublands, and other open habitats.	Moderate; suitable habitat present 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.

Appendix A.
