

Sweeney/McCune Creek Outflow Recovery and Automation Project



Biological Technical Report

Solano Irrigation District
Solano County, California

January 2016



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Summary

The Solano Irrigation District (District), in cooperation with the Bureau of Reclamation proposes to install a weir within Sweeney Creek and McCune Creek confluence in Solano County, California. The purpose of the Sweeney/McCune Creeks Outflow Recovery and Automation Project (project) is to construct a long crested weir, spanning both creeks. The weir will assist the District in fulfilling its public purpose by conserving up to 12,360 acre-feet of water per year, thereby increasing water use efficiency. The Sweeney and McCune Creek weir structures will also provide the District the opportunity to recover a portion of the District drainage for re-use and water conservation.

This Biological Technical Report is a review and evaluation of the potential impacts to threatened, endangered, proposed listed or sensitive species and protected habitat resources as a result of the proposed project. Reconnaissance level surveys and a jurisdictional delineation were conducted within the proposed project's Biological Study Area (BSA), which is approximately 60 acres and encompasses the construction area with an approximate 50-foot buffer.

An analysis was conducted to assess the biological resources within the proposed project area that potentially could be impacted by the project's activities. The results of which determined that there are environmental resources that may be impacted by the construction of the proposed project. The potential impacts of the proposed project are summarized below.

After research and field surveys, it was determined that Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*), burrowing owl (*Athene cunicularia*) and western pond turtle (*Emys marmorata*) have a potential to occur in the BSA. With implementation/avoidance and mitigation measures, the project will minimize and avoid impacts to these species.

Sweeney Creek and McCune Creek are the only two jurisdictional water features within the BSA. The project is anticipated to permanently impact approximately 0.16 acres of jurisdictional waters and temporary impact approximately 1.00 acre of jurisdictional waters. Coordination and negotiations with appropriate agencies will be conducted to avoid and minimize and/or mitigate for the impacts to the sensitive biological resources discussed above. During the construction phase of the project, Best Management Practices (BMPs) will be implemented to further reduce impact to the biological resources present in the BSA.

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List of Abbreviated Terms

BMP	Best Management Practices
BSA	Biological Survey Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
District	Solano Irrigation District
EPA	Environmental Protection Agency
ESA	Environmental Sensitive Area
FESA	Federal Endangered Species Act
MBTA	Migratory Bird Treaty Act
Project	Sweeney/McCune Creeks Outflow Recovery and Automation Project
RWQCB	Regional Water Quality Control Board
SCWA	Solano County Water Agency
SCADA	Supervisory Control and Data Acquisition
SWPPP	Storm Water Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Society
USACE	U.S. Army Corps of Engineers

Chapter 1. Introduction

The Sweeney/McCune Creeks Outflow Recovery and Automation Project (project) is located in Solano County, California (Figure 1 Project Vicinity and Figure 2 Project Location). The project occurs within Township (T) 7 north and Range (R) 1 east, Section 33 of the Dixon United States Geological Survey (USGS) 7½ minute quadrangle.

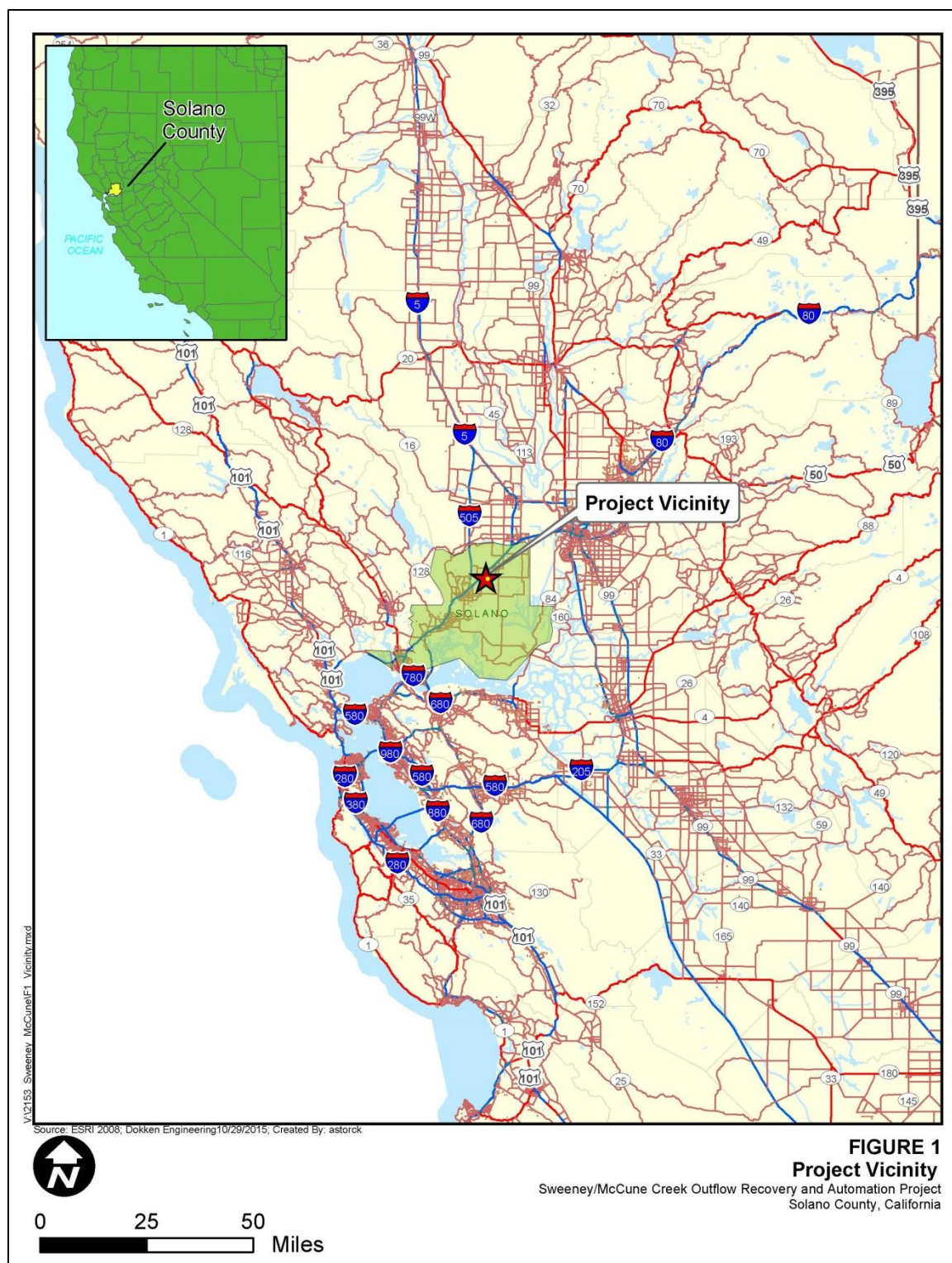
1.1. Project Description

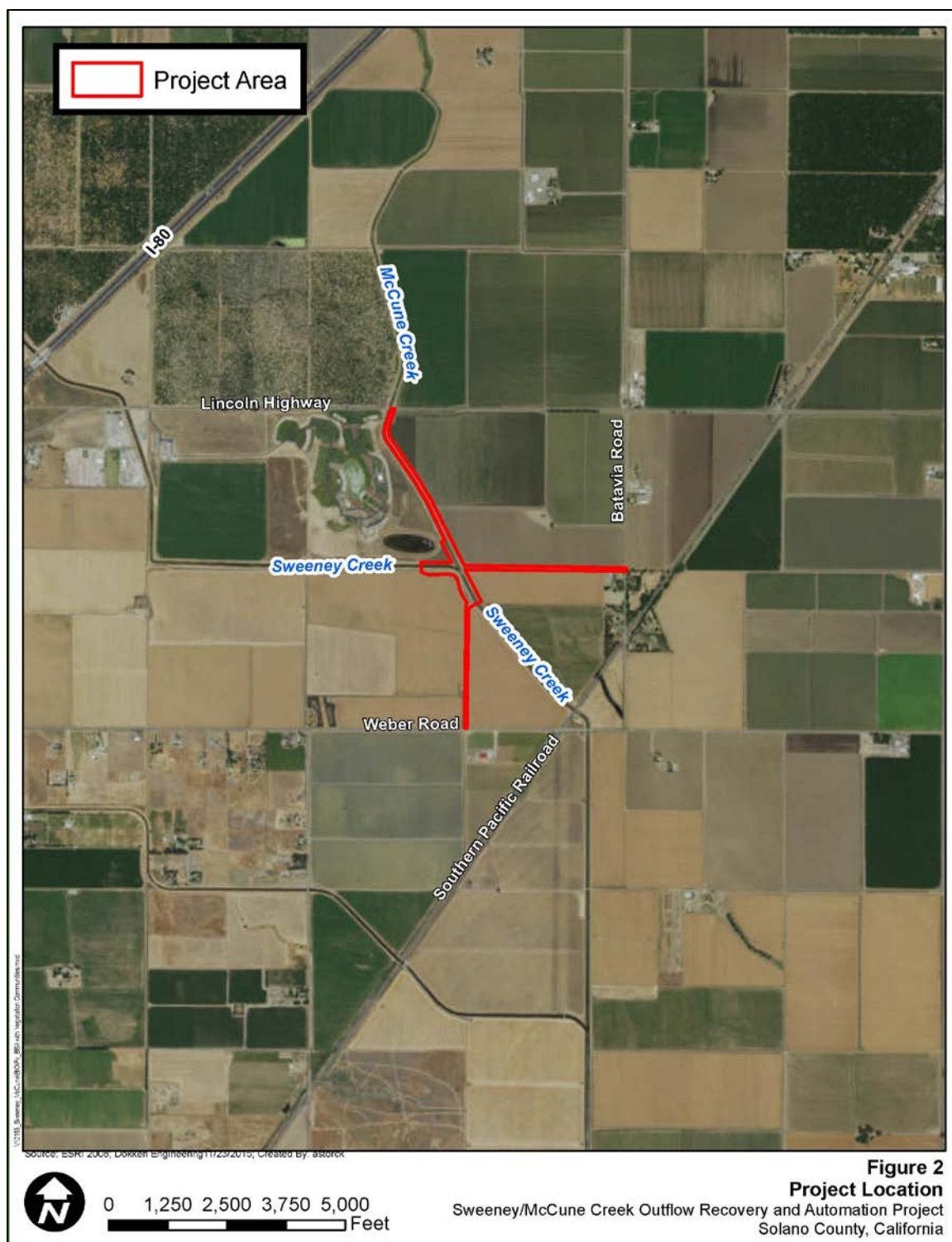
The Solano Irrigation District (District), in cooperation with Bureau of Reclamation (Reclamation), proposes to construct a long crested weir within the confluence of Sweeney Creek and McCune Creek, within unincorporated Solano County, California. The purpose of the project is to recover substantial surface water outflow for redistribution within the Solano Irrigation District boundaries by installing a long crested weir, along with integrated flume meters and automated discharge gates, within the canals.

Currently, Sweeney Creek and McCune Creek are unregulated drainage canals that provide approximately 32,000 acre-feet of water per year to adjacent farmlands for agricultural purposes. During the irrigation season, tail-water runoff from farm fields and operational spills enter the canals. Much of the drainage water that is not recovered within the canals travels eastward and eventually discharges into the Sacramento River, resulting in an unquantifiable loss of potential water for re-use per year.

The proposed project is needed to assist the District in their public responsibility by conserving up to 12,360 acre-feet of water per year. The water will be primarily re-used via irrigation applications by drip and micro-sprinkler systems thereby increasing water use efficiency. The Sweeney and McCune Creek confluence weir, flume meters and automated gates would provide the District the opportunity to impound and measure downstream water deliveries as well as recover a portion of District drainage for re-use and water conservation. This project would improve water management through measurement using supervisory control and data acquisition (SCADA) controlled automated gates, along with the long crested weir, to measure flow where water savings are not currently quantifiable.

Sweeney Creek and McCune Creek confluence is located approximately 0.55 miles south of Lincoln Highway via farm roads within unincorporated Solano County. The weir would be constructed in a manner to allow any natural drainage flows occurring during the non-irrigation season to simply pass through or flow across the structures. The project structure would provide control and automation capabilities to regulate flow rates to pass by the check structure. The portion of the long crested weir within Sweeney Creek is approximately 139' x 57' long, and the portion of the long crested weir within McCune Creek is approximately 72' x 59' long. The weir foot print requires an approximate excavation depth of 7.5 feet, and includes one outlet, slip gate controls, flume meters, and a SCADA system for automation and communications (Appendix A: Representative Photographs).





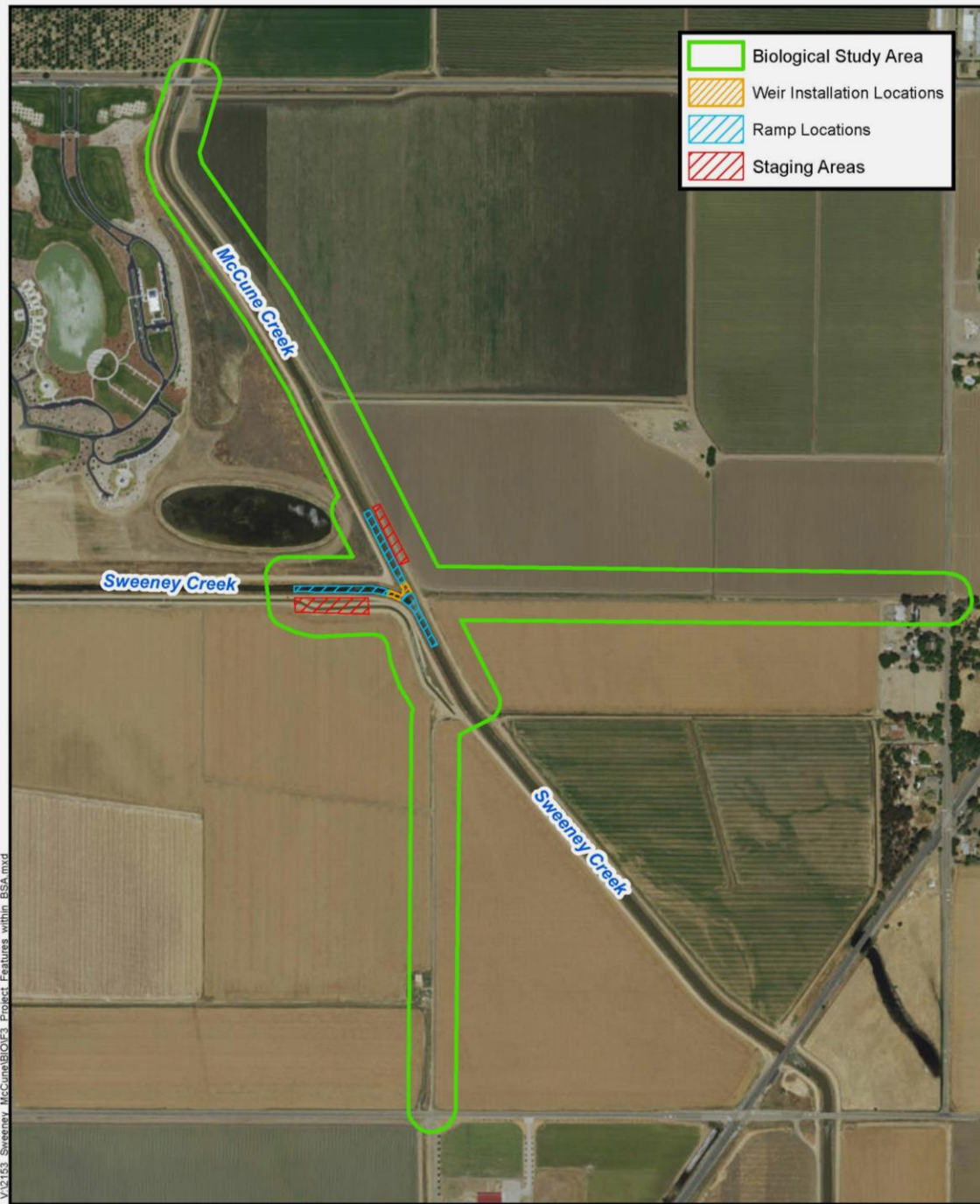


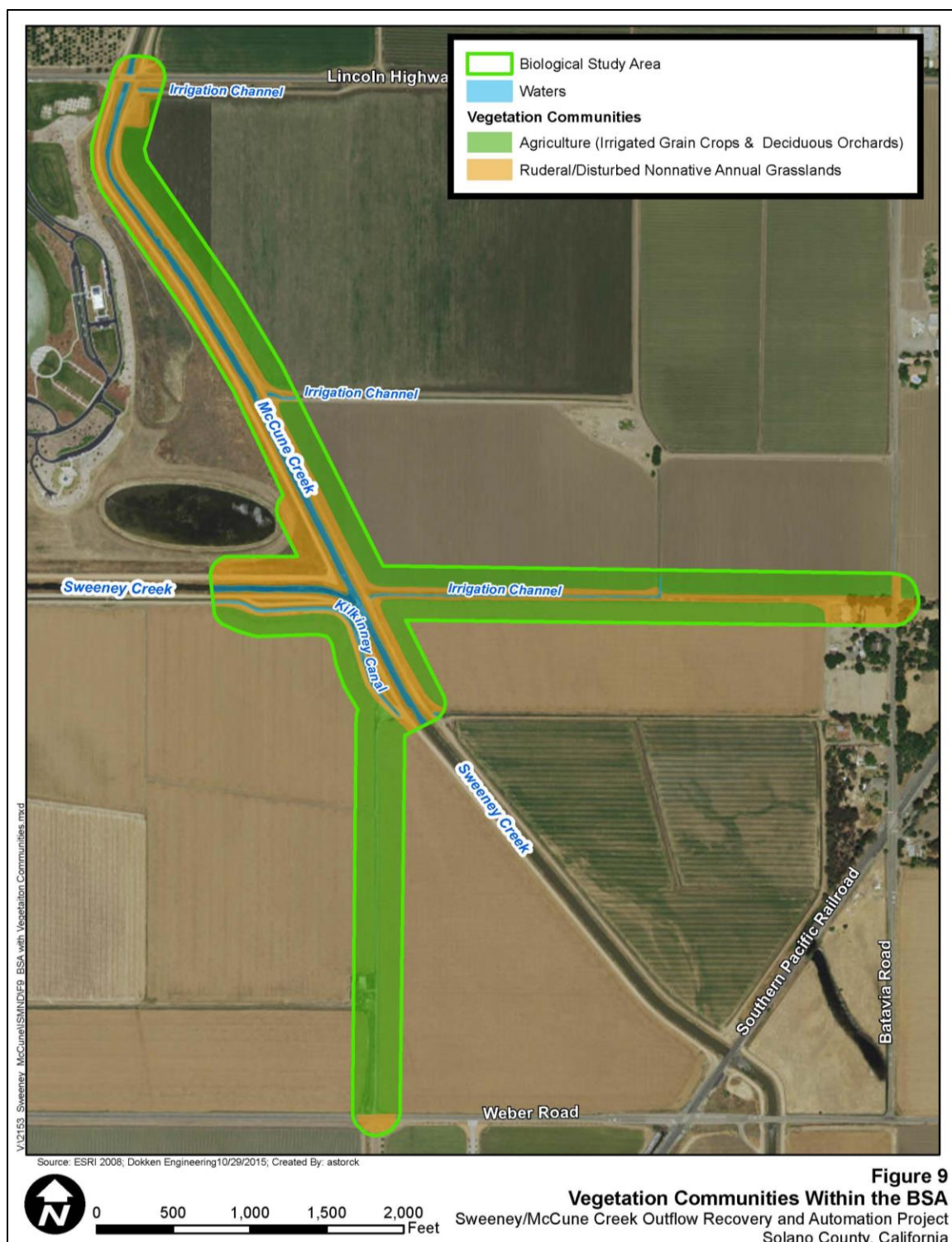
FIGURE 3
Project Features
 Sweeney/McCune Creek Outflow Recovery and Automation Project
 Solano County, California

To allow equipment to access the project site, access would be through farm roads located south of the project area via Weber Road approximately 2.5 miles east of I-80, east of the project area via Batavia Road approximately 0.5 miles north of the intersection of Batavia Road and Weber Road, and north of the project via Midway Road approximately 1.25 miles east of I-80. Construction and equipment staging is proposed to be located on farm roads adjacent to the canals. Temporary ramps would be installed within both channels to the north and south of the proposed weir location to allow for equipment passage. Ramp installation within the canal would take place after the canals are dewatered using water diversion pumps. Construction is anticipated to begin spring 2016 and will approximately last 2 months.

The Solano Irrigation District is the lead agency under CEQA and the Bureau of Reclamation is the lead agency under NEPA.

No-Project Alternative

Under the No-Build Alternative, a long crested weir would not be installed within Sweeney Creek and McCune Creek confluence. Surface water outflow would not be recovered for redistribution and as a result water management and savings would continue to be unquantifiable.



Chapter 2. Study Methods

Prior to biological surveys, literature research was conducted through the United States Fish and Wildlife Service (USFWS) (Appendix B: USFWS Species List), the California Department of Fish and Wildlife (CDFW) *California Natural Diversity Database* (CNDDDB) (Appendix C: CNDDDB Species List) and the California Native Plant Society (CNPS) *Electronic Inventory of Rare and Endangered Plants* (Appendix D: CNPS Species List) to identify habitats and special-status species having the potential to occur within the Biological Study Area (BSA). Areas include information compiled from USFWS, CNDDDB, and CNPS within the Dixon, Allendale, Dozier and Elmira USGS 7½ minute quadrangles. Field surveys were conducted May 13, 2015 by Dokken Engineering to document existing biological resources, detect potential jurisdictional waters of the United States and State, and search for suitable habitat and presence of sensitive protected species within the study area.

2.1. Regulatory Requirements

This section describes the Federal, State, and local plans, policies, and laws that are relevant to biological resources in the BSA. Applicable Federal permits and approvals that could be required before construction of the proposed project are provided in Chapter 5.

Federal Regulations

Federal Endangered Species Act (FESA)

The Federal Endangered Species Act (FESA) of 1973 (16 U.S.C. section 1531 et seq.) requires USFWS and National Oceanic and Atmospheric Administration fisheries division, National Marine Fisheries Service, to establish a list of endangered and threatened species. In addition, FESA insures that any actions are not likely to jeopardize the continued existence of listed species or modify their critical habitat.

Clean Water Act (CWA)

The Clean Water Act (CWA) was enacted as an amendment to the Federal Water Pollutant Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the U.S. CWA serves as the primary Federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. CWA empowers the U.S. Environmental Protection Agency (EPA) to set national water quality standards and effluent limitations, and includes programs addressing both point-source and non-point-source pollution. Point-source pollution originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site. Non-point-source pollution originates over a broader area and includes urban contaminants in storm water runoff and sediment loading from upstream areas. CWA operates on the principle that all discharges into the nation's waters are unlawful unless they are specifically authorized by a permit; permit review is CWA's primary regulatory tool. This project will

require a CWA Section 402 National Pollutant Discharge Elimination System (NPDES) Permit regulated by the State Water Resources Control Board (SWRCB).

The U.S. Army Corps of Engineers (USACE) regulates discharges of dredged or fill material into waters of the U. S. These waters include wetlands and non-wetland bodies of water that meet specific criteria, including a direct or indirect connection to interstate commerce. The USACE regulatory jurisdiction pursuant to Section 404 of the CWA is founded on a connection, or nexus, between the water body in question and interstate commerce. This connection may be direct (through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce) or may be indirect (through a nexus identified in the USACE regulations).

The Regional Water Quality Control Board (RWQCB) has jurisdiction under Section 401 of the CWA and regulates any activity which may result in a discharge to surface waters. Typically, the areas subject to jurisdiction of the RWQCB coincide with those of the USACE (i.e., waters of the U.S. including any wetlands). The RWQCB also asserts authority over “Waters of the State” under waste discharge requirements pursuant to the Porter-Cologne Water Quality Control Act.

Section 404: Permits for Fill Placement in Waters and Wetlands

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States. Waters of the United States refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands, including any or all of the following: areas within ordinary high water mark of a stream, including non-perennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned; and seasonal and perennial wetlands, including coastal wetlands.

Section 402: Permits for Stormwater Discharge

CWA Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System program, administered by EPA. In California, the State Water Resources Control Board is authorized by EPA to oversee the National Pollutant Discharge Elimination System program through RWQCBs. The project corridor and vicinity are under the jurisdiction of the Central Valley RWQCB. The District will apply for water quality certification from the Central Valley RWQCB.

Section 401: Water Quality Certification

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the State in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component

and may affect State water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401. The District will apply for water quality certification from the Central Valley RWQCB.

Executive Order 13186: Migratory Bird Treaty Act

EO 13186 (signed January 10, 2001) directs each Federal agency taking actions that could adversely affect migratory bird populations to work with USFWS. The USFWS has statutory authority and responsibility for enforcing the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712), the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 742l) and the Fish and Wildlife Act of 1956 (16 U.S.C. 742a–j). The MBTA implements Conventions between the United States and four countries (Canada, Mexico, Japan and Russia) for the protection of migratory birds.

The EO is designed to assist Federal agencies in their efforts to comply with the Migratory Bird Treaty Act (MBTA) (50 Code of Federal Regulations [CFR] 10 and 21) and does not constitute any legal authorization to take migratory birds. Take is defined under the MBTA as “the action of or attempt to pursue, hunt, shoot, capture, collect, or kill” (50 CFR 10.12) and includes intentional take (i.e., take that is the purpose of the activity in question) and unintentional take (i.e., take that results from, but is not the purpose of, the activity in question).

State Regulations

California Environmental Quality Act (CEQA)

California State law created to inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities and to work to reduce these negative environmental impacts. The District is the CEQA lead agency for this project.

California Endangered Species Act (CESA)

The California Endangered Species Act (CESA) (California Fish and Game (CFG) Code Section 2050 et seq.) requires CDFW to establish a list of endangered and threatened species (Section 2070) and to prohibit the incidental taking of any such listed species except as allowed by the Act (Sections 2080-2089). In addition, CESA prohibits take of candidate species (under consideration for listing).

Sections 3503 and 3503.5: Birds and Raptors

CFG Code Section 3503 prohibits the destruction of bird nests and Section 3503.5 prohibits the killing of raptor species and destruction of raptor nests.

Section 3513: Migratory Birds

CFG Code Section 3513 prohibits the take or possession of any migratory non-game bird as designated in the MBTA or any part of such migratory non-game bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

California Fish and Game Code: Section 1602

Under Section 1602 of the CFG Code, public agencies are required to notify CDFW before undertaking any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake.

Local Regulations***Solano Habitat Conservation Plan***

The Draft Solano Habitat Conservation Plan (HCP) will provide a comprehensive framework for complying with federal and state regulations for endangered species while accommodating future urban growth, development of infrastructure, and ongoing operations and maintenance activities associated with flood control, irrigation facilities, and other public infrastructure undertaken by or under the permitting authority/control of the HCP participants within the plan area. The HCP will implement conservation measures to ensure the protection of the 37 threatened and endangered species proposed for coverage under the Solano HCP and their habitat within the Solano County Water Agency (SCWA) service area (SCWA 2012). To date the HCP has not yet been finalized or enacted. The proposed project would not impact the HCP.

2.2. Studies Required

In order to comply with the provisions of various State and Federal environmental statutes and executive orders, the potential impacts to natural resources within the project area were investigated and documented. Information compiled from USFWS, CNDDB, and CNPS within the Dixon, Allendale, Dozier and Elmira USGS 7½ minute quadrangles, resulted in the identification of 47 sensitive species and 3 of which have an expectancy of occurrence within the BSA. Chapter 3, Table 3 provides a comprehensive list of special-status species with potential to occur within the region and provides a likelihood of occurrence for each species within the BSA. Based upon literature research, the following surveys and studies were conducted: general biological surveys, assessment of potential waters of the U.S. and State, and rare plant focused surveys.

The project site was field reviewed by Dokken Engineering biologists Carolynn Daman and Scott Salembier on May 13, 2015 to identify habitat types, potential for rare species, sensitive water quality receptors, and potential problem areas for the study.

Special-Status Plants

Literature review identified documented occurrences of 31 special status plant species within the search quadrangles; however, none of these occurrences were documented near the study area. In addition, no special status plant species were observed during field surveys and all special status plant species are presumed absent from the BSA. All of these species are discussed in further detail in Section 3.2.

Special-Status Wildlife

Based on existing literature and a search of the CNDDDB, USFWS and species distribution and habitat requirements data, 16 special-status wildlife species were identified as having the potential to occur within the search quadrangles specified prior to field surveys. The listing status, preferred habitat, and potential for occurrence in the project area for each of these species are listed in Section 3.2. Special-status migratory birds also have the potential to nest within the project area and are protected under California Fish and Game Code Sections 3503 and 3503.5 and the federal MBTA.

Review of known occurrences, species range maps, and an assessment of habitat available within the BSA determined that only 3 special status wildlife species have the potential to occur within the BSA. Full descriptions of each species' potential to occur within the project area is provided in section 3.2 Table-3. Burrowing owl (*Athene cunicularia*), white-tailed kite (*Elanus leucurus*) and Swainson's hawk (*Buteo swainsonii*) have potential to forage or migrate through the study area. A Swainson's hawk flew over the BSA during field surveys; however it did not nest within the project area. Additionally, a special-status reptile species, western pond turtle (*Emys marmorata*), was also observed within the BSA. These species are discussed below in section 3.2 Table-3.

2.3. Agency Coordination and Professional Contacts

United States Fish and Wildlife Service

On May 5, 2015 an official species list was obtained from the USFWS of Federal endangered and threatened species that could occur in the vicinity of the proposed project.

California Department of Fish and Wildlife

On May 5, 2015 an official species list was obtained from CNDDDB of State endangered, threatened and species of special concern that could occur in the vicinity of the proposed project.

2.4. Limitations That May Influence Results

Of all the surveys performed in the project area, the sensitive plant survey was the only one that had limitations possibly influencing results. Most plant species, common and sensitive, bloom from early spring to late fall. Even though field surveys were timed to fall within the bloom period for most plants, the blooming season may have been accelerated due to the severe drought in the region and some plants may have bloomed earlier than usual. Surveying out of the blooming season did not significantly impair the results of the rare plant survey as the BSA is dominated by invasive species and does not provide suitable habitat for most special status plant species

Chapter 3. Results: Environmental Setting

The project is located in an unincorporated area of Solano County, within the Great Valley floristic region and ecological Sacramento Valley subsection (Cal-IPC 2015). The Sacramento Valley experience Mediterranean conditions. Average summer highs reach approximately 90 degrees Fahrenheit (F) and winter low reach approximately 50 degrees F, with up to 15 inches of precipitation between October 1 through May 1 (US Climate Data 2015).

3.1. Biological Study Area

The approximate 60 acre BSA shown in Figure-4 was delineated with approximately 50 foot buffer around all permanent and temporary impacts, including proposed right-of-way, construction easements, cut and fill limits, and potential staging areas. The BSA, occurs at an elevation ranging from 54 to 62 feet above sea level and includes Sweeney Creek and McCune Creek. Much of the BSA is within disturbed areas comprised of irrigated agriculture and access roadways. The dominate soil type in the project area are composed of well drained, Reiff fine sandy loam soils (NRCS 2015). Vegetation communities along the creek channels include invasive ruderal vegetation along their banks and freshwater emergent vegetation in-channel.

Biological Conditions in the Biological Study Area

The BSA is located in the Sacramento Valley floristic region. Regional vegetation typically includes trees dominated by valley oak (*Quercus douglasii*) and interior live oak (*Quercus wislizenii*) series. Understory plants that typically dominate the region include grassland vegetation in California annual grassland series. Riparian vegetation adjacent to waterways are typically dominated by Himalayan blackberry (*Rubus armenianus*) and willow species (*Salix* sp.). Vegetation communities' specific to the BSA are ruderal/disturbed and irrigated agriculture (Mayer 1988).

Biological Communities

Two biological communities, in addition to waters, occur in the BSA. The 60 acres within the BSA include: Irrigated agriculture (34 acres) ruderal/disturbed nonnative annual grassland communities (22 acres), and waters (4 acres).

The location and extent of biological communities in the project area are shown in Figure-3, and described in detail below. The common and scientific names of plant and wildlife species observed in the study area are provided in Table-1 and Table-2 below.

Waters

Sweeney Creek and McCune Creek are present within the project area (Figure 4 Vegetation Communities Within the BSA). Approximately 1.05 acres (1,850 linear feet) of Sweeney Creek and approximately 2.00 acres (3,900 linear feet) of McCune Creek reside within the project area. McCune Creek originate from Putah Creek east of Lake Solano and Sweeney Creek originate in the English Hills and both naturally flow southeast until becoming channelized prior to the project area and their confluence (USFWS 2015b). Downstream of the confluence, McCune Creek joins Ulatis Creek through the Cache Slough to eventually join the Sacramento Deep Water Shipping Channel.

Both channels within the project area were assessed for Federal and State jurisdiction. The channels contain sand substrate with large cobbles and concrete debris (rock slope protection) and clearly defined banks covered with non-native vegetation. In-channel emergent vegetation is also present within these channels, which include tule (*Schoenoplectus acutus* var. *occidentalis*) and common cattail (*Typha latifolia*) (Appendix A: Representative Photographs). Both channels are used to convey irrigation water during the water delivery season, and act to drain the District's tailwater. Several inlet and outlet pipes for irrigation heavily influence the channels flow through the project area.

Four additional water features were identified during biological surveys that were concluded non-jurisdictional irrigation conveyance and drainage ditches. (Appendix A: Representative Photographs).

Agriculture

Agriculture fields containing irrigated grain crops and deciduous orchards are found within the BSA and surrounding area (CDFG 1988) (Figure 4 Vegetation Communities Within the BSA). Sunflowers (*Helianthus annuus*) and almond (*Prunus dulcis*) orchards dominate the agriculture fields (Appendix A: Representative Photographs). The agriculture fields are commonly irrigated, heavily disturbed and frequently maintained allowing low diversity of vegetation. Non-native, highly invasive vegetation including cheeseweed (*Malva parviflora*), common mallow (*Malva neglecta*), and western morning glory (*Calystegia occidentalis*) are common in these areas where disturbance has occurred (along borders and between agriculture crops). Agriculture crops makes up approximately 56% of the project area.

Ruderal/Disturbed Nonnative Annual Grassland

Ruderal/disturbed annual grassland vegetation is found within the BSA. Annual grassland is an herbaceous community dominated by non-native naturalized grasses with intermixed perennial and annual forbs, and exhibits low levels of diversity. Non-native annual grasslands in the project area appear to have been plowed or disturbed in the past and are somewhat degraded. Dominant grasses were non-native and included annual beard grass

(*Polypogon monspeliensis*), ripgut brome (*Bromus diandrus*), harding grass (*Phalaris aquatic*), and Italian rye grass (*Festuca perennis*). The dominant ruderal vegetation adjacent to channels and agriculture access roadways within hardscape and compacted soils were also non-native and consisted of yellow star-thistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*), sow thistle (*Sonchus asper*), and poison hemlock (*Conium maculatum*). For a complete list of observed plant species, see Table-1 below. Ruderal/disturbed annual grassland vegetation makes up approximately 37% of the project area.

Common Plant Species

Botanical surveys of the BSA were conducted on May 13, 2015 by Dokken Engineering. Many non-native species were observed within the BSA. Table 1 comprehensively lists the plant species observed during these surveys.

Table 1. Plant Species Observed within the BSA

Common Name	Scientific Name	Native (N)/Non-Native (X)/ Cal-IPC rating
Almond	<i>Prunus dulcis</i>	X
Annual beard grass	<i>Polypogon monspeliensis</i>	X (invasive)
Beavertail pricklypear	<i>Opuntia basilaris</i>	N
Black mustard	<i>Brassica nigra</i>	X (invasive)
Cheeseweed	<i>Malva parviflora</i>	X
Common cattail	<i>Typha latifolia</i>	N
Common mallow	<i>Malva neglecta</i>	X
Curly dock	<i>Rumex crispus</i>	X (invasive)
Fennel	<i>Foeniculum vulgare</i>	X (invasive)
Foxtail barley	<i>Hordeum murinum</i>	X (invasive)
Harding grass	<i>Phalaris aquatic</i>	X (invasive)
Italian rye grass	<i>Festuca perennis</i>	X (Invasive)
Italian thistle	<i>Carduus pycnocephalus</i>	X (invasive)
Mediterranean barley	<i>Hordeum marinum ssp. gussoneanum</i>	X
Mugwort	<i>Artemisia californica</i>	N
Poison hemlock	<i>Conium maculatum</i>	X (invasive)
Red stem filaree	<i>Erodium cicutarium</i>	X (invasive)
Ripgut brome	<i>Bromus diandrus</i>	X (Invasive)
Russian thistle	<i>Salsola tragus</i>	X (invasive)
Saltgrass	<i>Distichlis spicata</i>	N
Scarlet pimpernel	<i>Anagallis arvensis</i>	N
Silver dollar gum	<i>Eucalyptus polyanthemos</i>	X
Sow thistle	<i>Sonchus asper</i>	X
Sunflower	<i>Helianthus annuus</i>	N
Tule	<i>Schoenoplectus acutus var. occidentalis</i>	N
Wall bedstraw	<i>Galium parisiense</i>	X
Western morning glory	<i>Calystegia occidentalis</i>	N
Wild oat	<i>Avena fatua</i>	X (invasive)
Wild radish	<i>Raphanus sativus</i>	X (invasive)
Yellow star thistle	<i>Centaurea solstitialis</i>	X (invasive)

Common Wildlife Species

Limited wildlife habitat is available within the BSA. The existence of water features with emergent vegetation allows limited support of both prey and predatory species. Nonnative annual grasslands also provide foraging habitat and cover for many wildlife species. Wildlife species observed in this habitat during the field survey included many bird species, coyote (*Canis latrans*) (scat) and den, jack rabbits (*Lepus californicus*) and red-eared slider turtles (*Trachemys scripta elegans*). Nonnative annual grassland can provide foraging and resting habitat for a variety of migrating and wintering birds. Swainson's hawk was the only sensitive bird observed flying over the project area's nonnative annual grassland and western pond turtle was the only sensitive reptile observed within McCune Creek during the field study. Table 2 is a comprehensive list of wildlife observed or identified through sign in the BSA during the May 13, 2015 surveys.

Table 2. Wildlife Species Observed within the BSA

Common Name	Scientific Name	Native (N) / Non-native (X)
Birds		
American crow	<i>Corvus brachyrhynchos</i>	N
American kestrel	<i>Falco sparverius</i>	N
Barn swallow	<i>Hirundo rustica</i>	N
Black crowned night heron	<i>Nycticorax nycticorax</i>	N
Brewers blackbird	<i>Euphagus cyanocephalus</i>	N
Killdeer	<i>Charadrius vociferous</i>	N
Mallard	<i>Anas platyrhynchos</i>	N
Mourning dove	<i>Zenaida macroura</i>	N
Red-winged blackbird	<i>Agelaius phoeniceus</i>	N
Song sparrow	<i>Melospiza melodia</i>	N
Snowy egret	<i>Egretta thrula</i>	N
Swainson's hawk (flyover)	<i>Buteo swainsonii</i>	N
Turkey vulture (flyover)	<i>Cathartes aura</i>	N
Western meadowlark	<i>Sturnella neglecta</i>	N
Mammals		
Botta's pocket gopher	<i>Thomomys battae</i>	N
California ground squirrel	<i>Spermophilus beecheyi</i>	N
Coyote (scat and den)	<i>Canis latrans</i>	N
Black tailed jack rabbit	<i>Lepus californicus</i>	N
River otter	<i>Lontra canadensis</i>	N
Reptiles		
Coastal Range fence lizard	<i>Sceloporus occidentalis</i> ssp. <i>bocourtii</i>	N
Red-eared slider	<i>Trachemys scripta elegans</i>	X
Western pond turtle	<i>Emys marmorata</i>	N
Invertebrate		
Crayfish	<i>Cambarus</i> sp.	X

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3.2. Regional Sensitive Species

Table 3. Regional Sensitive Species

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
Amphibian/Reptile Species						
California red-legged frog	Rana draytonii	Fed: CA: DFW:	T -- SSC	Found in lowlands and foothills in or near deep permanent water sources with dense or shrubby riparian vegetation. Occupies a fairly distinct habitat, combining both specific aquatic and riparian components. Adults require dense, shrubby or emergent riparian vegetation closely associated with deep, still, or slow moving water.	A	Presumed absent. The project site lacks deep slow moving water sources with dense shrubby riparian vegetation; habitat unsuitable for California red-legged frog. Additionally, the nearest CNDDDB occurrence is greater than 20 miles southwest of the project area.
California tiger salamander	Ambystoma californiense	Fed: CA: DFW:	T T SSC	Inhabits annual grasslands and the grassy understory of valley-foothill hardwood communities. Requires underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	A	Presumed absent. The project site lacks sufficient ground squirrel burrows and vernal pools. The nearest recorded CNDDDB occurrence is approximately 5 miles northeast; however this occurrence has been determined extirpated. Habitat unsuitable for California tiger salamander.
Giant garter snake	Thamnophis gigas	Fed: CA: DFW:	T -- --	Inhabits marsh, swamp, wetland (including agricultural wetlands), sloughs, ponds, rice fields, low gradient streams and irrigation/drainage canals adjacent to uplands. Ideal habitat contains both shallow and deep water with variations in topography. Species requires adequate water during the active	A	Presumed absent. According to the Solano Habitat Conservation Plan (SCWA, 2012), GGS is associated with the valley floor grassland, vernal pool natural communities, and other aquatic habitats such as flooded rice fields. These habitats are not found within the BSA or surrounding area. Because of the

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				season (April-November), emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat and mammal burrows estivation. Requires grassy banks and openings in waterside vegetation for basking and higher elevation uplands for cover and refuge from flood waters during winter dormant season.		general lack of extensive flooded fields in Solano County and the apparent landscape level relationships between the quality of the aquatic habitat and surrounding land uses, GGS is presumed to be restricted to areas that would have appropriate cover, high food availability, and upland refuge (Halstead et al 2010). The proposed project area within Sweeney and McCune creek is highly disturbed by agricultural practices. The adjacent upland habitat is regularly disced and is comprised of established stone fruit orchards and non-flooded agriculture crops (sunflowers), unsuitable for the species. In addition, the banks of the creeks contain limited to no mammal burrows for the species' estivation needs. Further, the canals contain a narrow (<1 foot wide) strip of, emergent vegetation which does not provide adequate habitat for the species' escape cover or foraging. According to the Solano HCP, areas supporting what would generally be considered marginal to poor habitat or small isolated patches of good habitat, such as that within the proposed project area, are presumed to not

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
						<p>support GGS in Solano County due to the lack of surrounding aquatic habitats (<i>i.e.</i>, rice fields).</p> <p>The range of GGS in Solano County, based on only three known records (CDFG 2015), is confined to the Yolo Bypass area and the tidally influenced area in the eastern portion of the County (Wylie and Martin 2004) which are approximately 8 miles east of the BSA. This location lacks connectivity to the project area and is surrounded by regularly disked agricultural land with little to no vegetative cover. Additionally, USGS conducted GGS surveys in 2004 and 2005 at a number of other locations, including the historical record sites in Solano County that they determined would be most likely to support this species, but none were found (Wylie and Martin 2004). Based on the lack of GGS records from Solano County and the lack of recent observations it appears that GGS is very rare or may have been extirpated from Solano County. Solano County fell within the lowest of the suitability categories in an analysis of the potential habitat distribution in the Sacramento</p>

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
						Valley (Halstead et al 2010). Based on a lack of suitable habitat in the BSA and surrounding area and a lack of recent regional occurrences of the species, the species is presumed absent from the BSA.
Western pond turtle	<i>Emys marmorata</i>	Fed: CA: DFW:	-- -- SSC	A fully aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Requires basking sites and suitable (sandy banks or grassy open field) upland habitat for reproduction (4,690 feet).	HP	Present: The BSA contains potentially suitable stream channel habitat and aquatic vegetation for the species. The species was observed within the BSA in McCune Creek. The nearest CNDDDB occurrence of the species is approximately 10 miles from the BSA within Travis Air Force Base with no connectivity to the project area.
Bird Species						
Burrowing owl	<i>Athene cunicularia</i>	Fed: CA: DFW:	-- -- SSC	Species inhabits arid, open areas with sparse vegetation cover such as deserts, abandoned agricultural areas, grasslands, and disturbed open habitats. Requires friable soils for burrow construction (Below 5,300 feet).	HP	Low/Moderate potential. The project site contains sparse vegetation cover and disturbed open habitats with suitable mammal burrows on the western side of the project. The nearest recorded CNDDDB occurrence is approximately 1.2 miles north of the project area. During biological surveys, no burrowing owl sign was observed.
Swainson's hawk	<i>Buteo swainsoni</i>	Fed: CA: DFW:	-- T --	Inhabits grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands	HP (foraging)	High potential. The project site contains Swainson's hawk foraging areas. Minimal nesting habitat is located within the

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, alfalfa or grain fields that support a stable rodent prey base. Breeds March to late August.		project area at the eastern end of the BSA along Batavia road approximately 0.5 miles east of the project site. Equipment disturbance in this area would be limited to driving down farm roads by nesting habitat to access the project site. Construction activities would only occur within the canal at the confluence of Sweeney and McCune creek. Approximately 30 occurrences of the species occur within 2 miles of the project site. During biological surveys Swainson's hawk was observed flying over project site; however, no nesting was observed within the BSA.
Tricolor blackbird	<i>Agelaius tricolor</i>	Fed: CA: DFW:	-- -- SSC	Inhabits freshwater marsh, swamp and wetland communities that can support large colonies. Requires protected dense nesting habitat, preferably in emergent wetland vegetation and foraging area with insect prey in close proximity to colony.	A	Presumed absent: The project area lacks adequate freshwater marsh, swamp or wetland communities sufficient to support a colony: habitat unsuitable for tricolor blackbird. Additionally, the nearest reported CNDDDB occurrence is approximately 8 miles north of the project area.
White-tailed kite	<i>Elanus leucurus</i>	Fed: CA: DFW:	-- -- FP	Inhabits rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Prefers open grasslands, meadows or marshes for foraging close to isolated, dense-topped trees for	A	Low/Moderate potential. The BSA contain foraging habitat for white-tailed kite. The nearest CNDDDB occurrence is approximately 0.5 miles east with suitable nesting habitat. Minimal nesting habitat is located within the project area at the eastern

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				nesting and perching. Breeds February-October.		end of the BSA along Batavia road approximately 0.5 miles east of the project site. Equipment disturbance in this area would be limited to driving down farm roads by nesting habitat to access the project site. Construction activities would only occur within the canal at the confluence of Sweeney and McCune creek. The species was not observed during the May 13, 2015 biological surveys.
Fish Species						
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	Fed: CA: DFW:	T -- --	Spawning occurs in small tributaries on coarse gravel beds in riffle areas. Central Valley steelhead are found in the Sacramento River system; the principal remaining wild populations spawn annually in Deer and Mill Creeks in Tehama County, in the lower Yuba River, a small population in the lower Stanislaus River.	HP	Presumed absent. The project area transects Sweeney and McCune Creek, permanent water sources. Central Valley Steelhead are not historically known to occur within these channels, and a preliminary search of tributaries, New Alamo Creek and Ulatis Creek, did not yield data or reports related to the historical presence of the species (SCWA, 2012). McCune Creek originates from Putah Creek and Sweeney Creek originates in the English Hills. Both flow southeast until becoming channelized upstream of their confluence, prior to the project area (USFWS, 2015b). Putah Diversion Dam diverts water coming out of Lake Berryessa into the Putah South Canal. The Putah South Canal

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
						diversion at the Putah Diversion Dam is the upstream terminus of steelhead migration within the area. Downstream of the Putah Diversion Dam and the confluence of Sweeney Creek and McCune Creek, McCune Creek joins Ulatis Creek through the Cache Slough. The existing canals empty surface water into Liberty Island/Cache Slough, though only when rain events are extreme and run-off is in excess. Multiple potential fish passage barriers are located in Sweeney Creek between the project and ocean waters. These barriers primarily take the form of irrigation weirs and control structures with vertical drops ranging from 4 to 9 feet in height and likely exclude anadromous fish from the project area. 11 additional potential fish passage barriers were also identified upstream of the project area that would prevent anadromous fish from accessing potentially suitable spawning habitat higher in the watershed (Solano HCP 2012). In addition, no suitable spawning habitat is present within the BSA and water temperatures within the canals during irrigation season are not conducive for survival of any life

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
						stage of the species. Based on a lack of suitable habitat in the BSA and surrounding area, and a lack of connectivity to areas with recent occurrences of the species, the species is presumed absent from the BSA.
Delta smelt	<i>Hypomesus transpacificus</i>	Fed: CA: DFW:	T E --	Occurs within the Sacramento-San Joaquin Delta and seasonally within the Suisun Bay, Carquinez Strait and San Pablo Bay. Most often occurs in partially saline waters.	HP	Presumed absent. The project area transects Sweeney Creek and McCune Creek, permanent water sources. The species is not historically known to occur within these channels. The project site occurs outside of designated Critical Habitat. The operations of the irrigation system fluctuates flow throughout the year and even lacks water seasonally; therefore not accommodating anadromous fish species. Additionally, 7 miles downstream of the project site, a fish barrier within Ulatis Creek is present which likely is excluding Delta smelt from the BSA.
Longfin smelt	<i>Spirinchus thaleichthys</i>	Fed: CA: DFW:	C T SSC	Resides in California and are primarily an anadromous estuarine species that can tolerate salinities ranging from freshwater to nearly pure seawater. Prefers temperatures in the range of 16-18°C and salinities ranging from 15-30 ppt. Their spatial distribution within a bay or estuary is seasonally variable. Longfin smelt may	HP	Presumed absent. The project area transects Sweeney Creek and McCune Creek, permanent water sources. The species is not historically known to occur within these channels. The operations of the irrigation system fluctuates flow throughout the year and even lacks water seasonally; therefore not accommodating anadromous fish species. Additionally, 7 miles

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				also make daily migrations; remaining deep during the day and rising to the surface at night.		downstream of the project site, a fish barrier within Ulatis Creek likely excluding longfin smelt from the project area.
Invertebrate Species						
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	Fed: CA: DFW:	E -- --	Inhabits relatively large and turbid clay bottomed playa vernal pools. Species requires pools to continuously hold water for a minimum of 19 days and must remain inundated into the summer months. Occupied playa pools typically are 1 to 88 acres in size, but species may utilize smaller, less turbid pools.	A	Presumed absent. The project site lacks vernal pools; habitat unsuitable for conservancy fairy shrimp. Additionally, the nearest recorded CNDDDB occurrence is approximately
Delta green ground beetle	<i>Elaphrus viridis</i>	Fed: CA: DFW:	T -- --	A species closely associated with vernal pools. Species restricted to Jepson Prairie area in Solano County. Females lay eggs in the early winter.	A	Presumed absent. The project site lacks vernal pools and is located approximately 10 miles northwest of the Jepson Prairie area. Habitat unsuitable for Delta green ground beetle.
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	Fed: CA: DFW:	T -- --	Species requires elderberry shrubs as host plants. Typically occurs in moist valley oak woodlands associated with riparian corridors in the lower Sacramento River and upper San Joaquin River drainages. (Sea level-3,000 feet).	A	Presumed absent. During field surveys in May 13, 2015 no elderberry shrubs, host plants for valley elderberry longhorn beetle, were observed. Additionally, the nearest recorded occurrence is approximately 5 miles north of the project area.
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Fed: CA: DFW:	T -- --	In California inhabits portions of Tehama county, south through the Central Valley, and scattered locations in Riverside County and the Coast Ranges. Species associated with smaller and	A	Presumed absent: The project site lacks deep cool-water vernal pools with elevated alkaline levels; habitat unsuitable for vernal pool fairy shrimp. Additionally, the nearest recorded

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				shallower cool-water vernal pools approximately 6 inches deep and short periods of inundation. Inhabited pools have low to moderate levels of alkalinity and total dissolved solids. The shrimp are temperature sensitive, requiring pools below 50 F to hatch and dying within pools reaching 75 F. Young emerge during cold-weather winter storms.		CNDDDB occurrence is approximately 1 mile north of the project area.
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	Fed: CA: DFW:	E -- --	Inhabits vernal pools and swales containing clear to highly turbid waters such as pools located in grass bottomed swales of unplowed grasslands, old alluvial soils underlain by hardpan, and mud-bottomed pools with highly turbid water.	A	Presumed absent. The project site lacks the requisite vernal pools and swales; habitat unsuitable for vernal pool tadpole shrimp. Additionally, the nearest recorded occurrence is approximately 6.5 miles from the project area.
Plant Species						
Alkali milk-vetch	<i>Astragalus tener</i> <i>var. tener</i>	Fed: CA: CNPS:	-- -- 1B.2	An annual herb inhabiting low ground and alkaline soils of playas, alkaline flats, vernal moist meadows, vernal pools, and valley and foothill grassland with adobe clay. Flowers March–June (0-197 feet).	A	Presumed absent. The project site lacks vernal moist meadows with adobe clay or alkaline soils. Habitat unsuitable for alkali milk-vetch. Additionally the nearest recorded CNDDDB occurrence are greater than 5 miles from the project area and are possibly extirpated.
Adobe lily	<i>Fritillaria pluriflora</i>	Fed: CA: CNPS:	-- -- 1B.2	A perennial bulbiferous herb inhabiting chaparral, cismontane woodlands and valley and foothill grasslands with adobe soils. Flowers February-April (195-	A	Presumed absent. The project site is no greater than 62 feet, well outside the lower elevation range; habitat unsuitable for adobe lily.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				2,312 feet).		
Baker's navarretia	<i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	Fed: CA: CNPS:	-- -- 1B.1	An annual herb inhabiting cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grasslands, and vernal pool with mesic soils. Flowers April-July (16-5,708 feet).	A	Presumed absent. The project site lacks cismontane woodlands, lower montane coniferous forests, meadow and seeps and vernal pools with mesic soils. Habitat unsuitable for Baker's navarretia. Additionally, the nearest recorded CNDDDB occurrence is approximately 4 miles of the project area.
Bearded popcornflower	<i>Plagiobothrys hystriculus</i>	Fed: CA: CNPS:	-- -- 1B.1	An annual herb inhabiting mesic valley and foothill grassland, vernal pool margins and vernal swales. Flowers April-May (0-899 feet).	A	Presumed absent. The project site lacks vernal pools and vernal swales. Habitat unsuitable for bearded popcornflower. Additionally, the nearest recorded CNDDDB occurrence is approximately 4.5 miles of the project area.
Boggs Lake hedge-hyssop	<i>Gratiola heterosepala</i>	Fed: CA: CNPS:	-- E 1B.2	An annual herb inhabiting clay soils and shallow waters of marshes and swamps, lake margins, and vernal pools. Flowers April-August (33-7,792 feet).	A	Presumed absent. The project site lacks shallow marshes and swamps, lake margins and vernal pools with clay soils. Habitat unsuitable for Boggs Lake hedge-hyssop. Additionally, the nearest recorded CNDDDB occurrence is approximately 8.5 miles of the project area.
Bolander's water-hemlock	<i>Cicuta maculate</i> var. <i>bolanderi</i>	Fed: CA: CNPS:	-- -- 2B.1	A perennial herb inhabiting coastal marshes and swamps with fresh or brackish water. Flowers July-September (6-660 feet).	A	Presumed absent. The project site lacks coastal marshes and swamps with brackish waters. Habitat unsuitable for Bolander's water-hemlock. Additionally, the nearest recorded CNDDDB occurrence is approximately 10

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
						miles of the project area.
Brittlescale	<i>Atriplex depressa</i>	Fed: CA: CNPS:	-- -- 1B.2	An annual herb inhabiting alkaline, clay soils of chenopod scrub, meadows and seeps, playas, vernal pools and valley and foothill grassland communities. Flowers June–October (0-1,049 feet).	A	Presumed absent. The project site lacks alkaline or clay soils, meadows and seeps, playas and vernal pools. Habitat unsuitable for brittlescale. Additionally, the nearest recorded CNDDDB occurrence is approximately 9.5 miles of the project area.
Carquinez goldenbush	<i>Isocoma argute</i>	Fed: CA: CNPS:	-- -- 1B.1	A perennial shrub inhabiting valley and foothill grasslands with alkaline soils. Flowers August-December (0-65 feet).	A	Presumed absent. The project site lacks alkaline soils; habitat unsuitable for Carquinez goldenbush. Additionally, the nearest recorded CNDDDB occurrence is approximately 5 miles of the project area.
Colusa grass	<i>Neostapfia colusana</i>	Fed: CA: CNPS:	T E 1B.1	An annual herb inhabiting adobe soils of large or deep vernal pools. Flowers May –August (0-656 feet).	A	Presumed absent. The project site lacks large, deep vernal pools with adobe clay soils. Habitat unsuitable for Colusa grass. Additionally, the nearest recorded CNDDDB occurrence is approximately 10 miles of the project area.
Contra Costa goldfields	<i>Lasthenia conjugens</i>	Fed: CA: CNPS:	E -- 1B.1	An annual herb inhabiting cismontane woodland, alkaline playas, valley and foothill grasslands, and vernal pools with mesic soils. Flowers March-June (0-1,541 feet).	A	Presumed absent. The project site lacks cismontane woodland, alkaline playas, and vernal pools with mesic soils. Habitat unsuitable for Contra Costa goldfields. Additionally, the nearest recorded CNDDDB occurrence is approximately 7 miles of the project area and possibly extirpated.
Delta mudwort	<i>Limosella australis</i>	Fed:	--	A perennial herb inhabiting low	A	Presumed absent. The project

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
		CA: CNPS:	-- 2B.1	elevation muddy banks of coastal wetlands and estuaries. Flowers April (0-10 feet).		site is well outside the upper elevation range of the species; habitat unsuitable for Delta mudwort.
Delta tule pea	<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Fed: CA: CNPS:	-- -- 1B.2	A perennial herb inhabiting freshwater and brackish marshes and riparian communities. Flowers May - July (0-15 feet).	A	Presumed absent. The project site is well outside the upper elevation range of the species; habitat unsuitable for Delta tule pea.
Dwarf downingia	<i>Downingia pusilla</i>	Fed: CA: CNPS:	-- -- 2B.2	An annual herb inhabiting vernal pools and mesic valley and foothill grassland communities. Flowers March-May (3-1,460 feet).	A	Presumed absent. The project site lacks the requisite vernal pool communities; habitat unsuitable for dwarf downingia. Additionally, the nearest recorded CNDDDB occurrence is approximately 4.5 miles of the project area.
Ferris' milk-vetch	<i>Astragalus tener</i> var. <i>ferrisiae</i>	Fed: CA: CNPS:	-- -- 1B.1	An annual herb inhabiting alkaline flats, vernal moist meadows, and valley and foothill grasslands. Flowers April -May (6-250 feet).	A	Presumed absent. The project site lacks the requisite alkaline flats and vernal moist meadows; habitat unsuitable for Ferris' milk-vetch. Additionally, the nearest recorded CNDDDB occurrence is approximately 7 miles of the project area.
Fragrant fritillary	<i>Fritillaria liliacea</i>	Fed: CA: CNPS:	-- -- 1B.2	A perennial herb (bulb) inhabiting cismontane woodlands, coastal prairies, coastal scrub, valley and foothill grasslands and vernal pools with serpentine soils. Blooms February-April (9-1,345 feet).	A	Presumed absent. The project site lacks cismontane woodlands, coastal prairies and vernal pools with serpentine soils. Habitat unsuitable for fragrant fritillary. Additionally, the nearest recorded CNDDDB occurrence is approximately 9 miles of the project area.
Heartscale	<i>Atriplex cordulata</i> var. <i>cordulata</i>	Fed: CA:	-- --	An annual herb inhabiting saline or alkaline soils of chenopod	A	Presumed absent. The project site lacks meadows and seeps,

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
		CNPS:	1B.2	scrub, meadows and seeps, and sandy valley and foothill grassland communities. Flowers June –July (0-1,837 feet).		and chenopod scrub with saline or alkaline soils. Habitat unsuitable for heartscale. Additionally, the nearest recorded CNDDDB occurrence is approximately 8 miles of the project area.
Heckard's pepper-grass	<i>Lepidium latipes</i> <i>var. heckardii</i>	Fed: CA: CNPS:	-- -- 1B.2	An annual herb found in alkaline flats within valley and foothill grasslands. Flowers March-May (0 - 660 feet).	A	Presumed absent. The project site lacks alkaline flats. Habitat unsuitable for Heckard's pepper-grass. Additionally, the nearest recorded CNDDDB occurrence is approximately 7 miles of the project area.
Hispid salty bird's-beak	<i>Chloropyron molle</i> <i>spp. hispidum</i>	Fed: CA: CNPS:	-- -- 1B.1	An annual herb inhabiting moist alkaline soils of saline marshes and flats, meadows and seeps, playas, and valley and foothill grassland communities. Flowers June-July (0-509 feet).	A	Presumed absent. The project site does not contain the requisite alkaline soils or saline marshes and flats, meadows and seeps; habitat unsuitable for hispid salty bird's beak. Additionally, the nearest recorded CNDDDB occurrence is approximately 10 miles of the project area.
Legenere	<i>Legernere limosa</i>	Fed: CA: CNPS:	-- -- 1B.1	An annual herb inhabiting wet areas, vernal pools, and ponds. Flowers May-June (0-2,887 feet).	H	Presumed absent. The project site contains wet areas; however the nearest occurs is greater than 10 miles and is located within vernal pools. During botanical surveys May 13, 2015 the species was not observed.
Mason's lilaeopsis	<i>Lilaeopsis masonii</i>	Fed: CA: CNPS:	-- -- 1B.1	A perennial rhizomatous herb found exclusively in the Sacramento-San Joaquin River Delta and San Francisco Bay. Found in low elevation freshwater and brackish mashes	A	Presumed absent. The project site lacks freshwater or brackish marshes adjacent to surface water; habitat unsuitable for Mason's lilaeopsis. Additionally, the nearest recorded CNDDDB

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				adjacent to surface water. Flowers April - November (0 - 100 feet).		occurrence is approximately 9 miles of the project area.
Pappose tarplant	<i>Centromadia parryi</i> ssp. <i>parryi</i>	Fed: CA: CNPS:	-- -- 1B.1	An annual herb inhabiting chaparral, coastal scrub, meadows, seeps, marshes, swamps (coastal salt), and valley foothill grasslands often with alkaline soils. Flowers May - November (0 – 1,377 feet.).	A	Presumed absent. The project site lacks chaparral, coastal scrub, meadows and seeps with alkaline soils. Habitat unsuitable for pappose tarplant. Additionally, no recent CNDDDB occurrences of the species have been documented.
Recurved larkspur	<i>Delphinium recurvatum</i>	Fed: CA: CNPS:	-- -- 1B.2	A perennial herb inhabiting poorly drained, fine, alkaline soils in chenopod scrub, Atriplex scrub, cismontane woodland, and valley and foothill grassland communities. Flowers March-June (10- 2,592 feet).	A	Presumed absent. The project site lacks poorly drained soils and chenopod scrub, and Atriplex scrub communities. Habitat unsuitable for recurved larkspur. Additionally, the nearest recorded CNDDDB occurrence is approximately 6 miles of the project area.
Round-leaved filaree	<i>California macrophylla</i>	Fed: CA: CNPS:	-- -- 1B.1	An annual herb inhabiting clay soils and open sites of valley and foothill grassland and cismontane woodland communities. Flowers March-May (49-3,937 feet).	A	Presumed absent. The project site lacks clay soils; habitat unsuitable for round-leaved filaree. Additionally, no recent CNDDDB occurrences of the species have been documented.
Saline clover	<i>Trifolium hydrophilum</i>	Fed: CA: CNPS:	-- -- 1B.2	An annual herb inhabiting mesic alkaline soils within marshes, swamps, vernal pools, and valley/ foothill grasslands. Flowers April-June (0 – 1,000 feet).	A	Presumed absent. The project site lacks marshes, swamps, and vernal pools with mesic alkaline soils. Habitat unsuitable for saline clover. Additionally, the nearest recorded CNDDDB occurrence is approximately 7 miles of the project area.
San Joaquin	<i>Extriplex</i>	Fed:	--	An annual herb inhabiting	A	Presumed absent. The project

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
spearscale	<i>joaquinana</i>	CA: CNPS:	-- 1B.2	alkaline soils of chenopod scrub, meadows and seeps, playas and valley and foothill grassland communities. Flowers April-September (0-2,739 feet).		site lacks chenopod scrub, and meadows and seeps with alkaline soils. Habitat unsuitable for San Joaquin spearscale. Additionally, no recent CNDDDB occurrences of the species have been documented.
San Joaquin Valley orcutt grass	<i>Orcuttia inaequalis</i>	Fed: CA: CNPS:	-- -- 1B.2	An annual herb inhabiting vernal pools of valley grassland, freshwater wetlands, and wetland-riparian communities. Flowers April –September (33-2,624 feet).	A	Presumed absent. The project site lacks vernal pools. Habitat unsuitable for San Joaquin Valley orcutt grass. Additionally, the nearest recorded CNDDDB occurrence is approximately 10 miles of the project area.
Showy Rancheria clover	<i>Trifolium amoenum</i>	Fed: CA: CNPS:	E -- 1B.1	An annual herb inhabiting moist, heavy soils of disturbed places, coastal bluff scrub and sometimes serpentine soils of valley and foothill grassland communities. Flowers April - June (0-1,361 feet).	A	Presumed absent. The project site contains heavily disturbed soils; however during May 2015 botanical surveys, no coastal bluff scrub communities were observed. Additionally, no recent CNDDDB occurrences of the species have been documented.
Solano grass	<i>Tuctoria mucronata</i>	Fed: CA: CNPS:	E E 1B.1	An annual herb inhabiting valley and foothill grasslands and vernal pools. Flowers April-August (16-32 feet).	A	Presumed absent. The project site lacks vernal pools and is greater than 22 feet, outside the upper elevation range. Habitat unsuitable for Solano grass.
Suisun marsh aster	<i>Symphyotrichum lentum</i>	Fed: CA: CNPS:	T E 1B.1	A perennial rhizomatous herb inhabiting wetlands, freshwater marsh, and brackish-marsh communities. Flowers May-November (0-984 feet).	A	Presumed absent. The project site lacks freshwater marshes or brackish-marsh habitat. Habitat unsuitable for Suisun marsh aster. Additionally, the nearest recorded CNDDDB occurrence is approximately 9 miles of the project area.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
Vernal pool smallscale	<i>Atripelx persistens</i>	Fed: CA: CNPS:	-- -- 1B.2	An annual herb inhabiting alkaline vernal pools. Flowers June-September (32-377 feet).	A	Presumed absent. The project site lacks vernal pools; habitat unsuitable for vernal pool smallscale. Additionally, the nearest recorded CNDDDB occurrence is approximately 7 miles of the project area.
Woolly rose-mallow	<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	Fed: CA: CNPS	-- -- 1B.2	A perennial rhizomatous herb inhabiting freshwater wetlands, wet banks, and marshes. Flowers June-September (0-394 feet).	A	Presumed absent. The project site lacks marshes, wet banks and freshwater wetlands. The nearest CNDDDB occurrence is greater than 10 miles and during the May 2015 botanical surveys the species was not observed.

Federal Designations (Fed):

(FESA, USFWS)

E: Federally listed, endangered**T:** Federally listed, threatened**CT:** Federal candidate, threatened**PT:** Federally proposed, threatened**State Designations (CA):**

(CESA, CDFW)

E: State-listed, endangered**T:** State-listed, threatened**CT:** State-candidate, threatened**R:** State-designated, rare**Other Designations**

CDFW_SSC: CDFW Species of Special Concern

CDFW_FP: CDFW Fully Protected

California Native Plant Society (CNPS) Designations:

***Note: according to CNPS (Skinner and Pavlik 1994), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10 of the California Fish and Game Code. This interpretation is inconsistent with other definitions.**

1A: Plants presumed extinct in California.**1B:** Plants rare and endangered in California and throughout their range.**2:** Plants rare, threatened, or endangered in California but more common elsewhere in their range.**3:** Plants about which need more information; a review list.**Plants 1B, 2, and 3 extension meanings:**

_.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

_.2 Fairly endangered in California (20-80% occurrences threatened)

_.3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Habitat Potential

Absent [A] - No habitat present and no further work needed.

Habitat Present [HP] - Habitat is, or may be present. The species may be present.

Critical Habitat [CH] – Project is within designated Critical Habitat.

Potential for Occurrence Criteria:

Present: Species was observed on site during a site visit or focused survey.

High: Habitat (including soils and elevation factors) for the species occurs on site and a known occurrence has been recorded within 5 miles of the site.

Low/Moderate: Either low quality habitat (including soils and elevation factors) for the species occurs on site and a known occurrence exists within 5 miles of the site; or suitable habitat strongly associated with the species occurs on site, but no records were found within the database search.

Presumed Absent: Focused surveys were conducted and the species was not found, or species was found within the database search but habitat (including soils and elevation factors) do not exist on site, or the known geographic range of the species does not include the survey area.

Sources: (allaboutbirds 2015), (Barr 1991), (Bennett 2005), (California Herps 2015), (CBD 2012), (CDFG 1994), (CNDDDB 2015), (CNPS 2015), (England 1997), (Jennings 1994), (Jepson 2012), (Keiller 2011), (Miller 1999), (NMFS 2005), (NMFS 2012) (UCD 2007), (UCD 2015), (USFWS 1983), (USFWS 1999), (USFWS 2002), (USFWS 2005), (USFWS 2006), (USFWS 2006b), (USFWS 2007), (USFWS 2007b), (USFWS 2012), (Zeiner 1988-1990).

Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Natural Communities of Concern

As shown in Figure 3, the only natural community of concern within the project's BSA is jurisdictional waters. A jurisdictional delineation was conducted in May 2015 to identify jurisdictional water of the United States and State of California within the BSA (Appendix E Preliminary Jurisdictional Delineation). Jurisdictional features within the project area discussed in this section include Sweeney Creek and McCune Creek. The proposed project would result in permanent effects to the jurisdictional features. As a result, Clean Water Act Section 401 and 404 permits would be necessary. The District will coordinate with the USACE for the Section 404 permit and the Central Valley RWQCB for the Section 401 permit. A Fish and Game Code Section 1602 Streambed Alteration Agreement would also be coordinated with CDFW. These permits and approvals would be coordinated during the final design and permitting phase of the project.

4.1.1.1. SURVEY RESULTS FOR JURISDICTIONAL WATERS

Sweeney Creek

The surveys conducted by Dokken Engineering biologists in May 2015 identified approximately 1.05 acre (1,850 linear feet) of Sweeney Creek, a confined irrigation channel, within the BSA. The channel ranges from 38-50 feet wide and ranges in depth depending on irrigation demands. During the time of surveys, depth in the channel ranged from 1-3 feet. In-channel emergent vegetation was also observed on the margins and within the channel; however, no wetlands were observed. Additionally, rip-rap was observed near the confluence with McCune Creek as well as in sections along the banks near irrigation outflows.

McCune Creek

The surveys conducted by Dokken Engineering biologists in May 2015 also identified approximately 2.00 acre (3,900 linear feet) of McCune Creek, a confined irrigation channel, within the BSA. The channel ranges from 30-38 feet wide and ranges in depth depending on irrigation demands. In-channel emergent vegetation was observed on the margins within the channel; however, no wetlands were observed. During the time of surveys, turbidity occurred in the channel due to high levels of inlet water from upstream irrigation channels. Additionally, rip-rap was observed near the confluence with Sweeney Creek as well as in sections along the banks near irrigation outflows.

4.1.1.2. JURISDICTIONAL WATERS AVOIDANCE AND MINIMIZATION EFFORTS

To avoid causing unnecessary impacts to jurisdictional waters, all measures in permits would be implemented including the following:

BIO-1: Temporary construction staging areas will be strategically placed to avoid and/or minimize impacts, when possible. Environmentally Sensitive Area (ESA) fencing shall be installed in coordination with a biologist in order to minimize soil disturbance and erosion around the project area.

Best Management Practices

BMPs will be incorporated into project design and project management to minimize impacts on the environment including reduction of sedimentation and release of pollutants (oils, fuel, etc.). Examples of minimization efforts include the use of silt-fencing, temporary energy dissipation facilities, and wattles. Implementation of BMPs and a Storm Water Pollution Prevention Plan (SWPPP) will reduce the potential for impacts from occurring outside the construction footprint. The following measures will be implemented to ensure BMPs.

BIO-2: Erosion Control Measures must be implemented during construction. To minimize the mobilization of sediment to adjacent water bodies, the following erosion-control and sediment-control measures will be included in the construction specifications.

- Soil exposure must be minimized through the use of temporary BMPs, groundcover, and stabilization measures;
- The contractor must conduct periodic maintenance of erosion- and sediment-control measures.

BIO-3: To conform to water quality requirements, the SWPPP must include the following:

- Vehicle maintenance, staging and storing equipment, materials, fuels, lubricants, solvents, and other possible contaminants must be a minimum of 100 feet from aquatic habitats. Any necessary equipment washing must occur where the water cannot flow into Sweeney Creek or McCune Creek. The project proponent will prepare a spill prevention and clean-up plan;
- Construction equipment will not be operated in flowing water;
- Construction work must be conducted according to site-specific construction plans that minimize the potential for sediment input to Sweeney Creek and McCune Creek;
- Raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life must be prevented from contaminating the soil or entering Sweeney Creek and McCune Creek;
- Equipment used in and around Sweeney Creek and McCune Creek must be in good working order and free of dripping or leaking engine fluids; and,
- Any surplus concrete rubble, asphalt, or other debris from construction must be taken to a County approved disposal site.

BIO-4: Upon completion of construction activities, any barriers (except weir) to surface water flow must be removed in a manner that would allow flow to resume with the least disturbance to the substrate.

BIO-5: Vegetation clearing must only occur within the delineated project boundaries. Vegetation should be removed in the late fall through winter months, to the greatest extent practicable.

BIO-6: Clean Water Act Section 401 and 404 permits and the California Department of Fish and Wildlife 1602 Streambed Alteration Agreement Permit will be obtained prior to construction.

BIO-7: Native fill will be utilized whenever possible.

BIO-8: Temporary staging areas, storage areas, and access roads involved with this project will take place, to the extent feasible, in the area of direct impact.

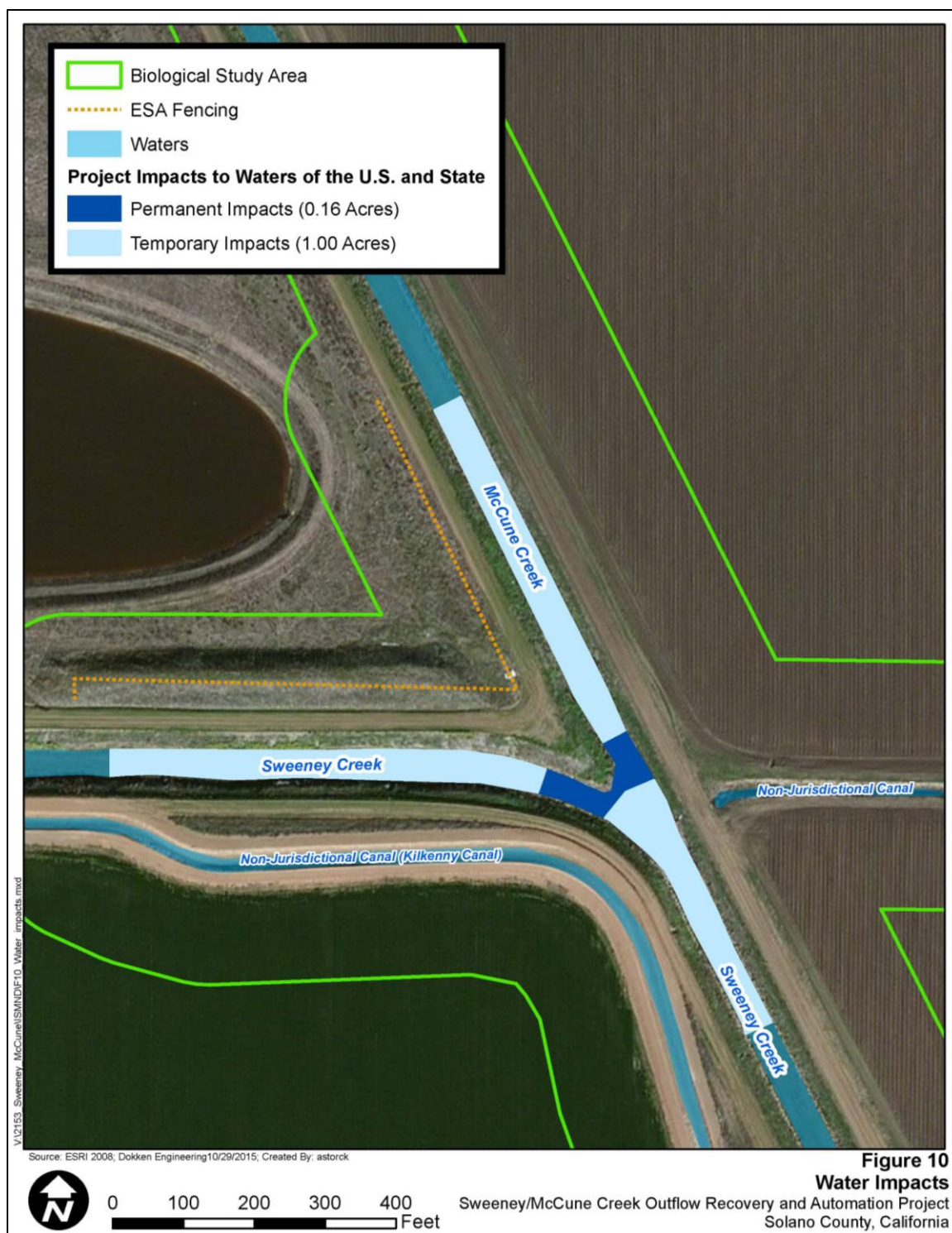
4.1.1.3. PROJECT IMPACTS TO JURISDICTIONAL WATERS

The construction of the channel weir will result in permanent effects to Sweeney Creek and McCune Creek. The effects would include permanent impacts of 0.09 acre to Sweeney Creek and 0.07 acre of McCune Creek. The permanent impacts for both channels include the concrete slab of the weir structures and 0.05 acre of rip rap for scour protection (Table 4. Effects to Jurisdictional Waters and Figure 5 Water Impacts).

Table 4. Effects to Jurisdictional Waters

	Waters of the U.S.		Water of the State	
Jurisdictional Waters	<i>Permanent Impact</i>	<i>Temporary Impact</i>	<i>Permanent Impact</i>	<i>Temporary Impact</i>
Sweeney Creek	0.09 acre	0.65 acre	0.09 acre	0.65 acre
McCune Creek	0.07 acre	0.35 acre	0.07 acre	0.35 acre
Total	0.16 acre	1.00 acre	0.16 acre	1.00 acre

Approximately 1.00 acre of temporary effects to jurisdictional water is anticipated from construction disturbance (temporary ramps, access, and temporary water diversion). Temporary disturbed areas will be returned to pre-construction conditions and **BIO-1** through **BIO-8** will be implemented to insure limited effects to jurisdictional waters.



4.1.1.4. COMPENSATORY MITIGATION FOR JURISDICTIONAL WATERS

Temporarily impacted areas of waters of the U.S. and State will be re-contoured to natural conditions and native hydroseed mixes will be used. Permanent impacts to water of the U.S. and State will be mitigated at a 2:1 ratio. Exact mitigation ratios and locations will be determined during the environmental permitting phase of the project.

BIO-9: All hydroseed and plant mixes must consist of a biologist approved plant palette seed mix from native, locally adapted species.

4.1.1.5. CUMULATIVE IMPACTS TO JURISDICTIONAL WATERS

Temporary and permanent impacts to jurisdictional waters are anticipated to occur within Sweeney Creek and McCune Creek (Table 3 Effects to Jurisdictional Waters). The project will have approximately 1.00 acre of temporary impacts to waters of the U.S. and State and approximately 0.16 acre of permanent impacts to waters of the U.S. and State. The proposed project has been designed to minimize all temporary and permanent impacts to the maximum extent practicable through the use of BMPs, implementations of regulatory permit conditions, ESA fencing and avoidance and minimization measures **BIO-1** through **BIO-8**. Mitigation provided by the project would ensure no net loss in water of the U.S and State within the region; therefore, no cumulative impacts attributed to the project would be anticipated.

4.2. Special Status Plant Species

USFWS and CDFW share regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the FESA and/or CESA.

Preliminary literature research determined 31 special status plant species had the potential to occur in the vicinity of the project. None of these species occurrences was documented near the BSA. Surveys conducted on May 13, 2015 by Dokken Engineering biologists Carolyn Daman and Scott Salembier, included a habitat assessment, and focused surveys for special status plant species. Based on these surveys and further literature research, habitat conditions within the BSA were determined to be potentially suitable for the following 3 species: legenere (*Legernere limosa*), Woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*), and showy rancheria clover (*Trifolium amoenum*).

Focused surveys for rare plants were specifically timed to fall within the legenere, woolly rose-mallow and showy Rancheria clover blooming season. May was determined to be the most appropriate survey month as May firmly falls within the recognized blooming season

for legumens and showy Rancheria clover. Woolly rose-mallow blooming season is traditionally June-September; however, with the drought year vegetation bloomed earlier than expected therefore surveys for woolly rose-mallow was conducted in May. The rare plant blooming surveys were comprehensive in nature and utilized the Jepson Herbarium manual, CNPS, Calflora and other references to compile a floral inventory of all species observed during the course of the survey. While any given survey does not guarantee a specimen will be blooming, surveys were conducted at a time when all rare species with potential to occur would be vegetatively visible. Although many species cannot be positively identified by vegetative characteristics alone, vegetative characteristics often can positively identify a genus. Therefore, any unknown specimen with vegetation consistent with that of the focused rare plant species would have been documented during the comprehensive floral survey. During the focused botanical surveys on May 13, 2015 no sensitive plant species were observed; therefore, the above sensitive plant species are presumed absent.

4.3. Special Status Wildlife Species

This section discusses potential impacts and permit requirements associated with all special-status animal species that could potentially be impacted by the project.

A search of USFWS, CDFW, and CNDDDB databases indicated 16 special-status wildlife species with potential to occur within or near the BSA. Based on biological surveys and conditions of the project site, the following was found:

Of the 16 special-status animal species with potential to occur within or near the BSA, 12 species are not expected, while two species have a low to moderate potential to occur, one species with a high potential to occur and one species presumed present onsite due to an observation of the species during biological surveys. Table-3 in this document includes these species further in detail.

4.3.1. Wildlife Species

The following species were observed or have a low/moderate potential to occur within the BSA.

White-Tailed Kite

White-tailed kite is a fully protected species under California Fish and Game Code Section 3511 and the MBTA. The species has a restricted distribution in the United States, occurring only in California and western Oregon and along the Texas coast (American Ornithologists' Union 1983). The species is fairly common in California's Central Valley margins with scattered oaks and river bottomlands. White-tailed kites nest in riparian and oak woodlands and forage in nearby grasslands, pastures, agricultural fields, and wetlands. They use nearby treetops for perching and nesting sites. Voles and mice are common prey species.

Swainson's Hawk

Swainson's hawk is State-listed as threatened and protected under the MBTA. Swainson's hawk migrates annually from wintering areas in South America to breeding locations in northwestern Canada, the western United States, and Mexico. In California, Swainson's hawks nest throughout the Central Valley in large trees in riparian habitats and in isolated trees in or adjacent to agricultural fields. The breeding season extends from late March through late August, with peak activity from late May through July (England et al. 1997). In the Central Valley, Swainson's hawks forage in large, open agricultural habitats, including alfalfa and hay fields (CDFG 1994). The breeding population in California has declined by an estimated 91% since 1900; this decline is attributed to the loss of riparian nesting habitats and the conversion of native grassland and woodland habitats to agriculture and urban development (CDFG 1994).

Burrowing Owl

Burrowing owl is not listed as a Federally or State listed species, but is a CDFW Species of Special Concern and is protected under the MBTA. The burrowing owl is a small, migratory owl found in various habitats throughout North America. Habitat requirements for burrowing owls consist of arid, open areas with sparse vegetation cover such as deserts, abandoned agricultural areas, grasslands, and disturbed open habitats. Friable soils are also important habitat requirements for this species. Though habitat loss due to urbanization is a contributing factor to population declines, burrowing owls seem to be highly tolerant of nearby human impacts when suitable habitat is present and maintained and when owls are not breeding (Shuford and Gardali 2008).

Burrowing owls rely on California ground squirrels (*Spermophilus beecheyi*) and other burrowing mammals for burrow construction. Although active throughout the day, burrowing owls mainly forage nocturnally for small vertebrate and invertebrate prey items such as small mammals, lizards, birds, and beetles (Shuford and Gardali 2008).

Western Pond Turtle

The western pond turtle is not a State or Federally listed species, but is a CDFW Species of Special Concern. The western pond turtle is a semi-aquatic turtle, inhabiting ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. The species requires suitable basking sites such as logs, rocks and exposed banks and associated upland habitat consisting of sandy banks or grassy open fields for reproduction. The species is omnivorous, consuming aquatic wildlife and vegetation for dietary requirements. The western pond turtle is known to hibernate underwater beneath muddy bottomed waters during colder climates, and nesting occurs from late April to August (Zeiner 1990).

4.3.1.1. WILDLIFE SPECIES SURVEY RESULTS

White-Tailed Kite

The BSA has potentially suitable foraging and nesting habitat for white-tailed kite. Several nesting site have been documented within a 5 mile of the project area. The nearest CNDDDB occurrence is approximately 0.5 miles east with suitable nesting habitat. Potential nesting habitat (several eucalyptus trees along Batavia Road approximately 0.5 miles east of the project site) exists within the eastern edge of the BSA. The species was not observed during biological surveys May 13, 2015. a preconstruction survey will be conducted as detailed in measures **BIO-14**.

Swainson's Hawk

Numerous Swainson's hawk nesting records are known within a 5-mile radius of the study area (CNDDDB 2015). During the May 13, 2015 surveys a pair of Swainson's hawks were observed flying over the BSA and nesting approximately 0.80 miles north of the project site. Irrigated agriculture fields provides suitable foraging habitat and nesting habitat (several eucalyptus trees along Batavia Road approximately 0.5 miles east of the project site) are present within the eastern edge of the project area. To date no recorded nest sites have occurred in the project area (CNDDDB 2015). a preconstruction survey will be conducted as detailed in measures **BIO-17**.

Burrowing Owl

The BSA has potentially suitable habitat (ruderal/disturbed non-native annual grassland) for the species since it includes open areas with sparse vegetation, abandoned mammal burrows and an agricultural plot with moderate prey availability. Several burrowing owls have been documented within 5 miles of the project site in similar environments to the project area. The closest CNDDDB occurrence from 2007 is approximately 1.6 miles west of the BSA. a pre-construction survey will be conducted as detailed in measures **BIO-15** and **BIO-16**.

Western Pond Turtle

No records of western pond turtle are known within the project vicinity; however, western pond turtle was observed basking during biological surveys within McCune Creek upstream of the project impact area. Both Sweeney Creek and McCune Creek provide potential basking habitat (exposed rocks), nesting habitat (upland grasslands), foraging habitat and a migration corridor throughout the area for western pond turtle. a pre-construction survey will be conducted and additional measures would be implemented if the species is found. Potential measures are detailed in measures **BIO-18** through **BIO-22**.

4.3.1.2. WILDLIFE SPECIES AVOIDANCE AND MINIMIZATION EFFORTS

To avoid all project effects to sensitive wildlife species, all measures in permits would be implemented including:

BIO-10: Before any activities begin on the project, the project biologist will conduct environmental awareness training for all construction personnel. At a minimum, the training will include a description of sensitive species with potential to occur, including white-tailed kite, burrowing owl, Swainson's hawk, and western pond turtle and their habitat, the project specific measures being implemented to conserve the species, and the boundaries within which the project may be accomplished.

BIO-11: If sensitive species are encountered during the course of construction, construction will temporarily stop within the area of discovery. The project biologist will be contacted immediately for further guidance. Work will not resume in the area of discovery until the project biologist has cleared the area or the animal has passively left the construction area unharmed.

BIO-12: All food-related trash must be disposed into closed containers and must be removed from the project area daily. Construction personnel must not feed or otherwise attract wildlife to the project area.

Sensitive Birds

Native birds, protected under the MBTA and similar provisions under CFG code, have the potential to nest within the BSA and the project area. During May 2015 biological surveys, nesting birds were not observed within the BSA but habitat is present. Measures **BIO-13** and **BIO17** will ensure protection of migratory nesting birds and sensitive birds during project construction.

BIO-13: If possible, vegetation removal should occur outside the breeding season for all bird species (March 1st –September 1st).

BIO-14: If vegetation removal is to take place during the nesting season (March 1st – September 1st), a pre-construction nesting bird survey must be conducted within 7 days prior to vegetation removal. Within 2 weeks of the nesting bird survey, all vegetation cleared by the biologist will be removed by the contractor.

A minimum 100 foot no-disturbance buffer will be established around any active nest of migratory birds and a minimum 300 foot no-disturbance buffer will be established around any nesting raptor species. The contractor must immediately stop work in the nesting area until the appropriate buffer is established and is prohibited from conducting work that could disturb the birds (as determined by the project biologist and in coordination with wildlife agencies) in the buffer area until a qualified biologist determines the young have fledged. A reduced buffer can be established if determined appropriate by the project biologist and approved by CDFW.

BIO-15: Qualified biologists will conduct a pre-construction survey for burrowing owl within 1-2 weeks of the start of construction. If burrowing owls are not detected, no further mitigation will be required.

If burrowing owls are observed within 500 feet of the project area, the following measures will be implemented:

BIO-16: Occupied burrows will not be disturbed during the breeding season (February 1st to August 31st) unless a qualified biologist approved by the CDFW verifies through non-invasive methods that either: 1) the birds have not begun egg-laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival. If avoidance of active nests is preferred, the biologist will consult with the CDFW to determine appropriate buffer widths and acreage of foraging habitat to be permanently preserved contiguous with the occupied burrow site. The Contractor will not disturb identified burrowing owl burrows until the qualified biologist verifies it has been cleared.

BIO-17: A protocol level pre-construction survey will be conducted for Swainson's hawk. This entails surveying all suitable nesting sites within a ¼ mile radius of the project area for evidence of Swainson's hawk activity according to the protocol survey methods recommended by the Swainson's Hawk Technical Advisory Committee.

If active nesting is identified within the ¼ mile radius, coordination with CDFW is required.

Western Pond Turtle

BIO-18: To avoid impacts to western pond turtles, the project biologist will conduct a pre-construction survey of Sweeney Creek and McCune Creek and adjacent banks and upland habitats within the project area. Surveys will be conducted no more than 24 hours prior to onset of construction. During April-August the biologist should look specifically for nests within upland habitats including grasslands. During initial ground disturbing activities within Sweeney Creek and McCune Creek, a qualified biologist will be present. If a turtle is located within the construction area, a qualified biologist will capture the turtle and relocate it to an appropriate habitat a safe distance from the construction site.

BIO-19: Pump intakes used to dewater the project area will be screened and equipped with an energy dissipater to protect aquatic species. The energy dissipater should be large enough to reduce approach velocity to 0.33 feet per second or less, and be enclosed with ½ inch metal screen. The surface area of the energy dissipater shall be determined by dividing the maximum diverted flow, but the allowable approach velocity (example: 1.0 ft³ per second/0.33 feet per second = 3.0 ft² surface area).

BIO-20: Construction personnel will operate vehicles at a speed no greater than 15 mph on unpaved roads within the project area.

4.3.1.3. PROJECT IMPACTS TO WILDLIFE SPECIES

White-tailed Kite

No white-tailed kite was observed within the project area or vicinity; however, potential foraging and nesting habitat exists within the project area. No impact to white-tailed kite foraging or nesting habitat is anticipated. No tree removal will occur within the project area. Potential foraging and nesting white-tailed kite habitat is located well outside the permanent impact areas; therefore, potential impacts are very low. Implementation of avoidance and minimization measures **BIO-10**, **BIO-13** and **BIO-14** during the nesting season will prevent impacts to white-tailed kite.

Swainson's Hawk

Swainson's hawk was observed within the vicinity of the project area; therefore, the species has potential to be within the project area foraging or nesting. However, no impact to Swainson's hawk foraging habitat or nesting habitat are anticipated. No tree removal will occur within the project area. Potential foraging and nesting Swainson's hawk habitat is located well outside the permanent impact areas; therefore, potential impacts are very low. Implementation of avoidance and minimization measures **BIO-17** during the nesting season will prevent impacts to Swainson's hawk.

Burrowing Owl

Although no sign of burrowing owls or burrowing owl activity was observed during the field surveys, there are known occurrences within 5 miles of the project area and potentially suitable burrowing owl habitat is within the BSA. Potential suitable burrowing owl habitat is located outside all permanent impact areas; therefore, potential impacts are very low. Implementations of **BIO-15** and **BIO-16** will reduce any potential for impact to burrowing owls.

Western Pond Turtle

Western pond turtle was observed with McCune Creek; therefore, the species has potential to be within the project area foraging, basking, or nesting. Temporary impacts of 1.00 acre and approximately 0.16 acres of permanent impacts to western pond turtle foraging, basking and migration habitat are anticipated. Implementation of avoidance and minimization measures **BIO-18** through **BIO-20** will reduce any potential for impact to western pond turtle.

4.3.1.4. COMPENSATORY MITIGATION FOR WILDLIFE SPECIES

With the implementation of avoidance and minimization measures, impacts to white-tailed kite, Swainson's hawk, burrowing owl and western pond turtle are not anticipated.

Compensatory mitigation is not required or proposed. If burrowing owls are found within the project area the following will be implemented:

BIO-21: Should destruction of occupied burrowing owl burrows be unavoidable during the non-breeding season (September 1st – January 31st) either, unsuitable burrows will be enhanced (enlarged or cleared of debris) or new burrows will be created (by installing artificial burrows) at a ratio of 2:1 on lands approved by the CDFW. Newly created burrows will follow guidelines established by the CDFW.

4.3.1.5. CUMULATIVE IMPACTS TO WILDLIFE SPECIES

Avoidance and minimization efforts have been incorporated into the project design to ensure no direct impact to any species as a result of this project.

Temporary and permanent impacts to sensitive wildlife habitat are anticipated to occur within Sweeney Creek and McCune Creek and adjacent areas. Suitable habitat for white-tailed kite, Swainson's hawk and burrowing owl foraging habitat and nesting habitat and western pond turtle basking, nesting and migration habitat were observed during the May 2015 biological surveys. The project will have approximately 1.00 acre of temporary impacts to waters of the U.S. and State and approximately 0.05 acre of permanent impacts to waters of the U.S. and State. The proposed project has been designed to minimize all temporary and permanent impacts to the maximum extent practicable through the use of avoidance and minimization measures **BIO-10** through **BIO-20**. Mitigation provided by the project would ensure no net loss in water of the U.S and State within the region; therefore, no cumulative impacts attributed to the project are anticipated.

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