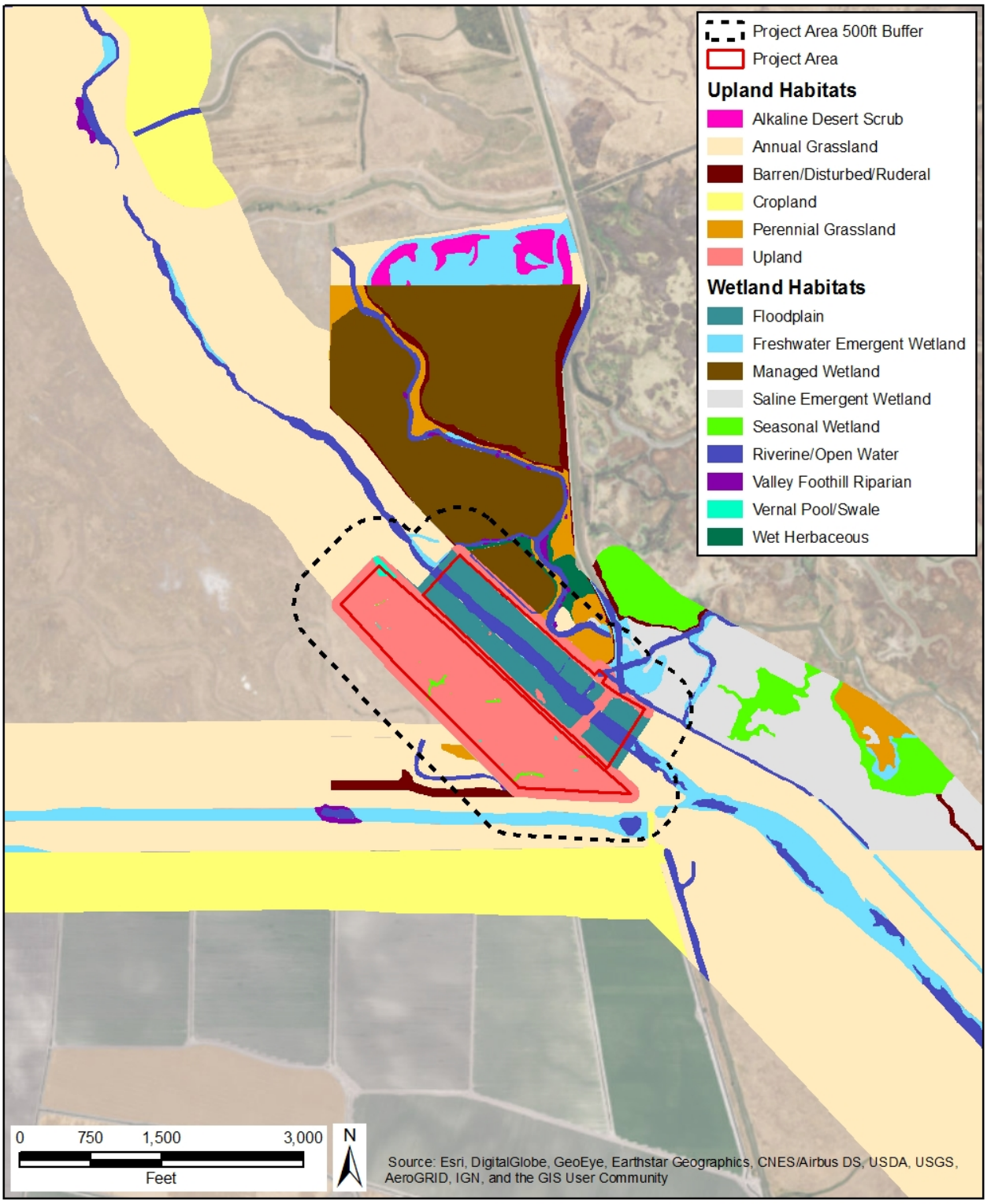
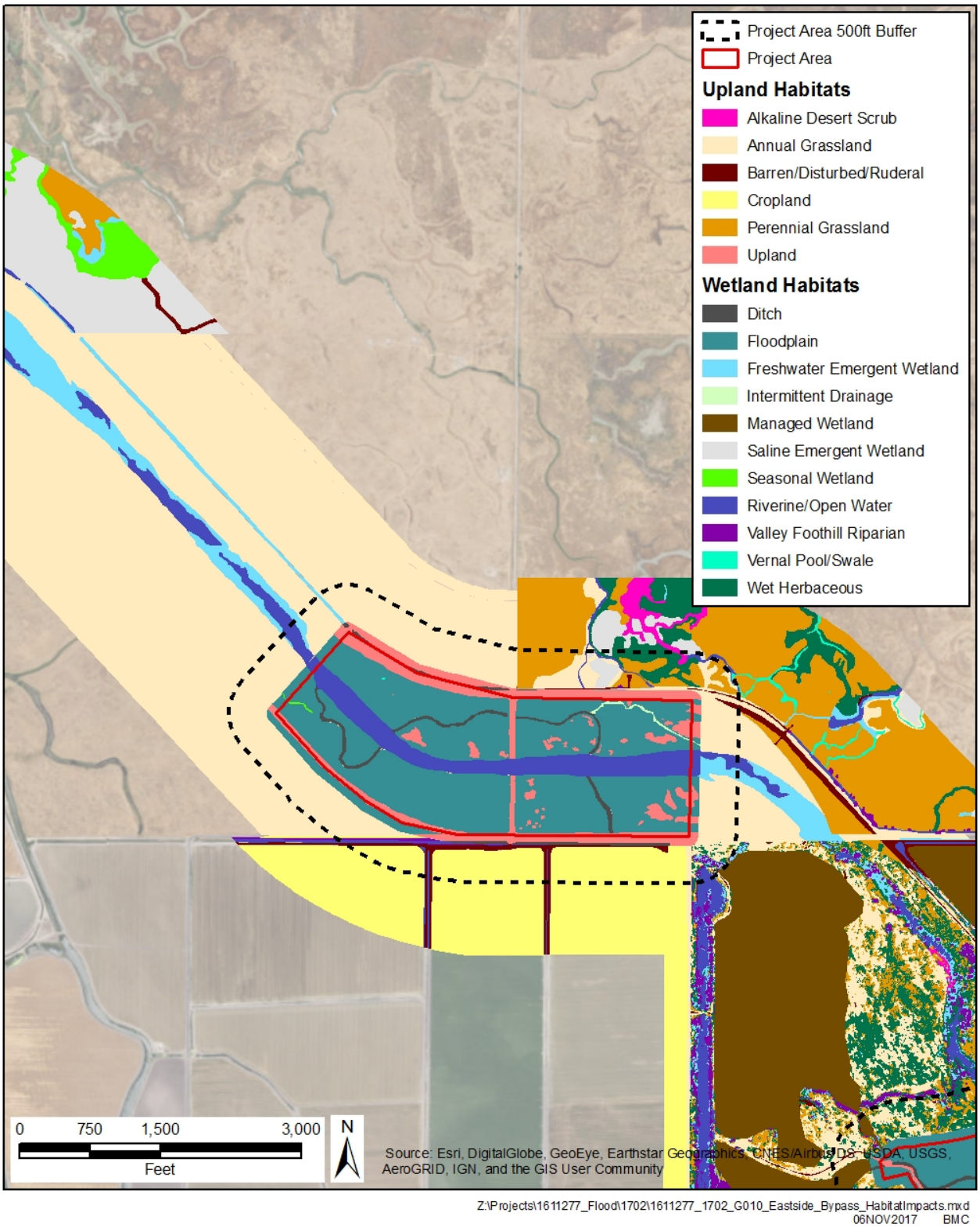
Figure 3.5-1b. Habitat Types (Eastside Bypass Control Structure Modifications)



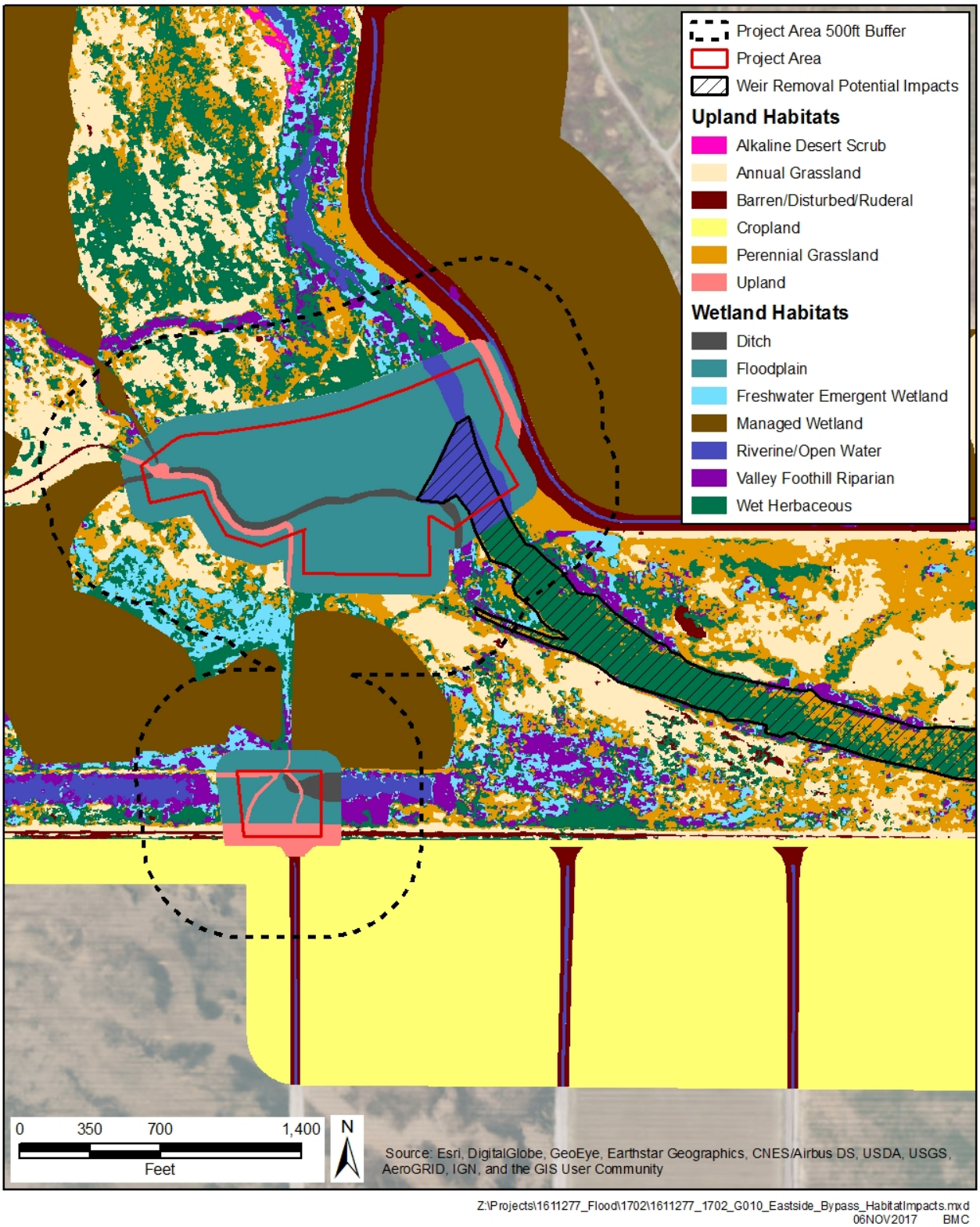
Source: CDM Smith, 2017

Figure 3.5-1c. Habitat Types (Dan McNamara Road Modifications)



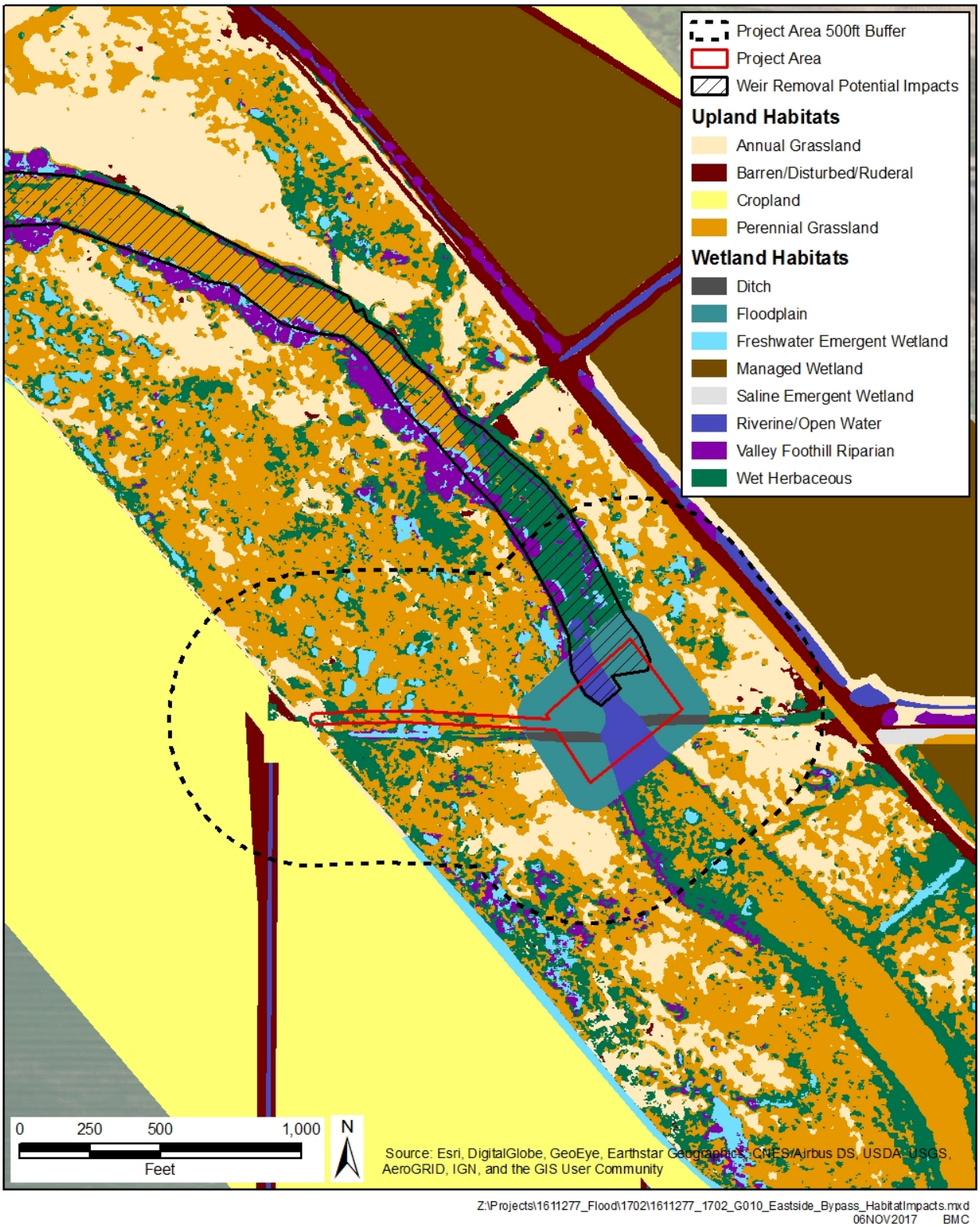
Source: CDM Smith, 2017

Figure 3.5-1d. Habitat Types (Lower Merced Weir Removal)



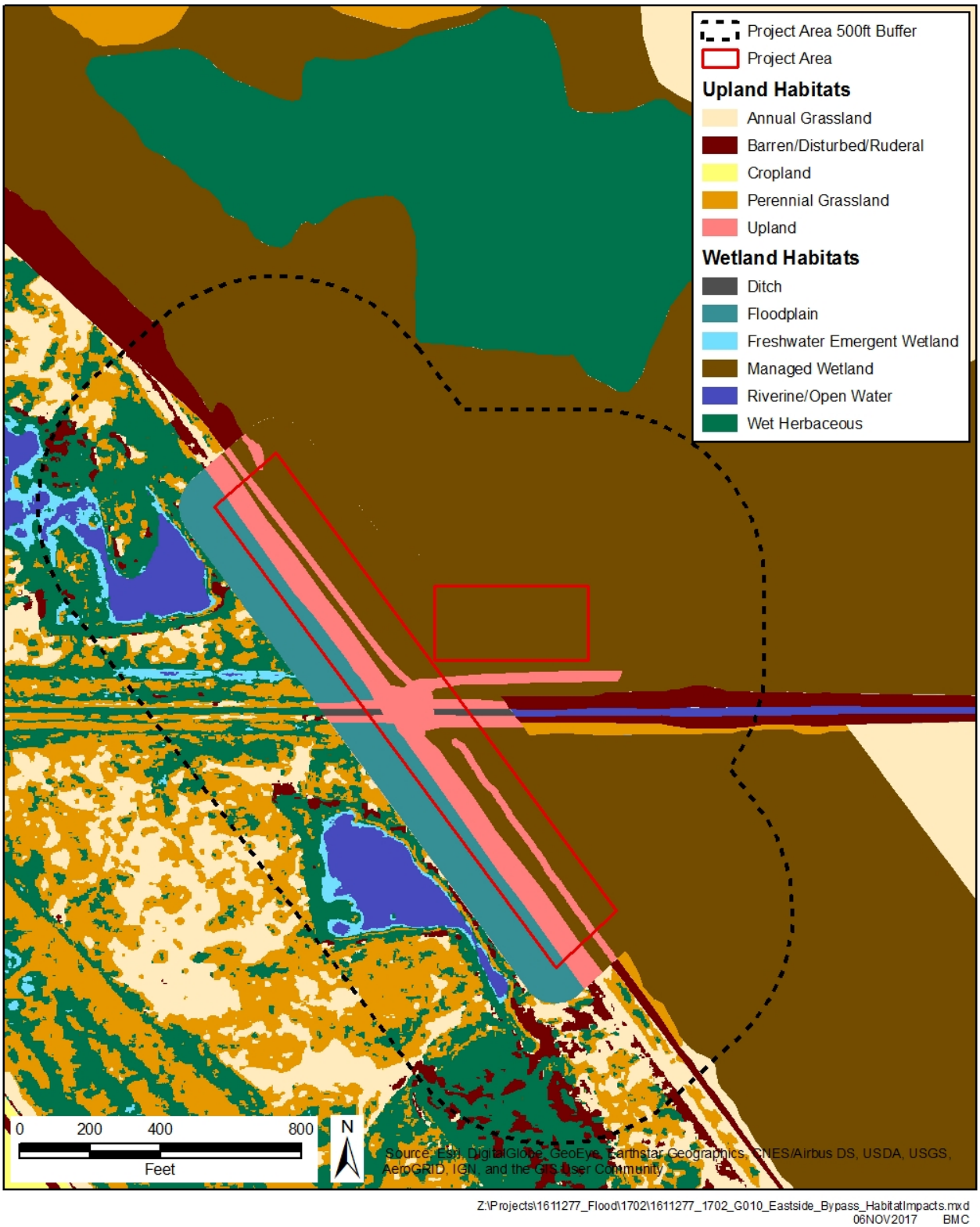
Source: CDM Smith, 2017

Figure 3.5-1e. Habitat Types (Upper Merced Weir Removal)



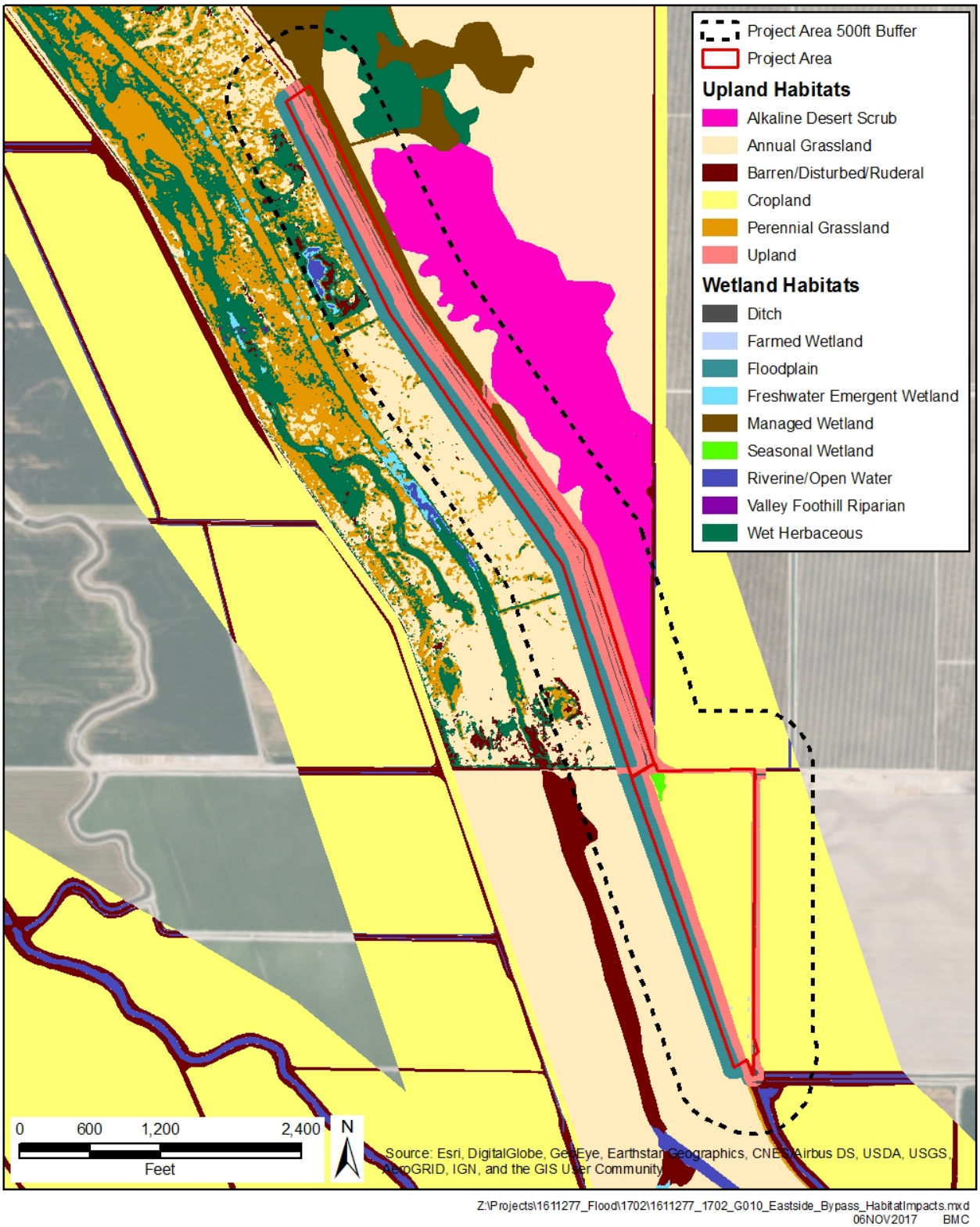
Source: CDM Smith, 2017

Figure 3.5-1f. Habitat Types (Levee Repairs O-1)



Source: CDM Smith, 2017

Figure 3.5-1g. Habitat Types (Levee Repairs O-3 & O-4)



Source: CDM Smith, 2017

Table 3.5-1. Project Area Habitat Types by Acreages and Types of Effects

Habitat Type	Acres (within immediate footprint)	Acres (500 feet around footprint)	Acres (between lower and upper weirs)	Type of Effects
Upland				
Alkali Desert Scrub	0	36.06	0	Areas outside of project footprint should be avoided.
Annual Grassland[1]	226.31	505.87	0.81	Temporary (in project footprint). In all project areas, would be restored to pre-project condition. Areas outside of project footprint should be avoided.
Barren/Disturbed/Ruderal	0	21.24	0	Areas outside of project footprint should be avoided.
Cropland	24.96	88.52	0	Temporary (in project footprint). Cropland would be temporarily affected in borrow and staging areas in levee Reach O-4. Areas outside of project footprint should be avoided.
Perennial Grassland[1]	23.92	100.33	10.08	Temporary (in project footprint). In all project areas, would be restored to pre-project condition. Areas outside of project footprint should be avoided.
Aquatic				
Freshwater Emergent Wetland	0.04	23.53	0.70[2]	Temporary (in project footprint) and potential indirect loss within 500-foot buffer and between weirs. This land cover type would be affected during the removal of the weirs (0.2 acre), the replacement of the culvert at Dan McNamara Road (0.02 acre), and the modifications at the control structure (0.1 acrs), but would be expected to recover. Freshwater emergent wetland surrounding the immediate project footprint may be indirectly affected by sedimentation and runoff from project construction. Approximately 0.70 acre of freshwater emergent wetland occurring between the two weirs (and outside of the immediate project footprint) could be indirectly affected from changes in inundation patterns; however, this land cover type is expected to persist between the weirs as it is located along the edges of the channel.
Managed Wetland	8.16	84.98	0	Temporary, although, in some cases, potentially permanent (in project footprint). Managed wetland would be temporarily affected in borrow and staging areas in levee Reach O-1 (5.99 acres), but could be permanently lost in levee Reach O-3 (2.18 acre). Areas outside of project footprint should be avoided; however, areas surrounding immediate project footprint may be indirectly affected by sedimentation and runoff from project construction.
Riverine/Open Water	40.81	33.93	24.59[2]	Temporary (in project footprint) and potential indirect disturbance within 500-foot buffer and between weirs. Riverine/open water would be temporarily affected during the removal of the weirs (3.98 acres), the replacement of the culvert at Dan McNamara Road (19.97 acres), and the modifications at the control structure (8.77 acres). Areas surrounding immediatete project footprint may be indirectly affected by sedimentation and runoff from project construction. In addition, up to approximately 25 acres of riverine/open water occurring between the two weirs (and outside of the immediate project footprint) may be indirectly affected from changes in inundation patterns, but would be expected to recover.

Table 3.5-1. Project Area Habitat Types by Acreages and Types of Effects

Habitat Type	Acres (within immediate footprint)	Acres (500 feet around footprint)	Acres (between lower and upper weirs)	Type of Effects
Saline Emergent Wetland	0	5.85	0	Avoided (in project footprint). Areas outside of project footprint for the Dan McNamara Road improvements and the Eastside Bypass Control Structure should be avoided.
Seasonal Wetland	1.14	0.05	0	Temporary or avoided (in project footprint). Seasonal wetlands occur within the proposed staging area for the Eastside Bypass Control Structure, within the proposed staging/borrow area for levee Reach O-4, and on the edge of the footprint for the Dan McNamara Road improvements; however, these seasonal wetlands should be avoided or temporarily affected. Areas outside of project footprint for the Dan McNamara Road improvements and the Eastside Bypass Control Structure should be avoided.
Valley Foothill Riparian	0	7.48	2.12[2]	Avoided (in project footprint) and potential indirect disturbance between weirs. Areas outside of project footprint should be avoided; however, changes in inundation patterns from weir removal could indirectly affect up to approximately 2 acres of this habitat type between the two weirs; however, this land cover type is expected to persist between the weirs as it is located along the edges of the channel.
Vernal Pool/Swale	0.29	0.40	0	Temporary or avoided (in project footprint) and potential indirect disturbance within 500-foot buffer. Vernal pools and vernal swales occur within the proposed staging area for the Eastside Bypass Control Structure and on the edge of the footprint for the Dan McNamara Road improvements; however, these features should be avoided, although could be indirectly affected by sedimentation and soil compaction. Areas outside of project footprint should be avoided.
Wet Herbaceous	0.22	51.37	16.76[2]	Temporary (in project footprint) and potential indirect disturbance between weirs. Wet herbaceous would be temporarily affected in weir removal activities (0.22 acre). However, approximately 17 acres of wet herbaceous occurring between the two weirs (and outside of the immediate project footprint) may be indirectly affected. The majority of this land cover type is expected to persist between the weirs as it is located along the edges of the channel; however, up to 5 acres of this land cover type could be permanently lost or altered from changes in inundation patterns, which would result in a change from "wet herbaceous" to "riverine/open water."
Total	**343.94**	**730.45**	**55.06**	

Note:

[1] Several acres of annual and perennial grasslands fall within the designated floodplain along the Eastside Bypass. Outside of the floodplain, these habitat types are also characterized as "upland" associated with vernal pool complexes and managed wetlands.

[2] The removal of the two weirs in the Eastside Bypass operated by the U.S. Fish and Wildlife Service within the Merced National Wildlife Refuge (NWR) would change inundation patterns within the bypass at lower flows. Under existing conditions, depressions within the Bypass and Refuge can inundate at depths of about 1 foot, providing potential wetland habitat for migratory birds. These depressions can be inundated during flood conditions (when there is water from levee toe to levee toe) or by placing the boards in the weirs part way (or "typical operation"), which results in ponding water from different sources. Depending on water availability, some areas either may no longer be inundated at flows of about 100 cubic feet per second from September through March or may become inundated at less frequent intervals. (It should be noted that the weir boards were not installed during the last year due to flood conditions and the presence of Restoration Flows). Additional water in the bypass from Restoration Flows would generally provide the opportunity for additional inundation during drier year types, especially during fall pulse flows when it is highly likely that the Merced NWR does not have water to inundate much of these areas. Inundation also does not occur during flood flows and other times when the weir gates are not in place to impound water. The weirs would be removed to improve fish passage in the bypass thereby changing the channel from a slower flow to a

Table 3.5-1. Project Area Habitat Types by Acreages and Types of Effects

Habitat Type	Acres (within immediate footprint)	Acres (500 feet around footprint)	Acres (between lower and upper weirs)	Type of Effects

less-obstructed flow. Because this section of the bypass has a relatively flat grade, the flow velocity is not expected to be greatly altered, but deeper water in the center of the channel would drain with unobstructed flows (an estimated 5 acres of "wet herbaceous" would change to "riverine/open water"), while the edge habitats would be expected to remain.

Sources: U.S. Bureau of Reclamation 2012b, U.S. Fish and Wildlife Service 2008, California Department of Water Resources 2011, Environmental Science Associates 2017

grasslands are classified as "floodplain," as these are within the designated floodplain along the Eastside Bypass, or as "upland," where this habitat type is associated with vernal pool complexes and managed wetlands.

Cropland

Includes irrigated hayfield, irrigated grain crop, and pasture. This habitat type occurs primarily along west side of Eastside Bypass.

Perennial Grassland

Perennial grassland occurs on the San Joaquin Valley alkaline soils that support alkali heath, alkali weed, salt heliotrope, saltgrass, and alkali sacaton. It occurs throughout the project area, but typically observed on the slightly drier flats above alkaline meadows or floodplains. Within **Figures 3.5-1a through 3.5-1g**, several acres of perennial grasslands are classified as "floodplain," as these are within the designated floodplain along the Eastside Bypass, or as "upland," where this habitat type is associated with vernal pool complexes and managed wetlands.

Wetland vegetation types are discussed below.

Wetlands and Other Waters

This section presents the potentially jurisdictional wetlands and other waters of the United States within the project area. These wetlands and other waters of the United States may be subject to regulation by USACE under Section 404 of the Federal Clean Water Act (CWA). All conclusions presented in this section are subject to a formal wetland delineation and verification or preliminary determination by USACE.

Table 3.5-2 summarizes the acreage of each potential jurisdictional waters of the United States found in the project area and includes the *Classification of Wetlands and Deepwater Habitats of the U.S.* (Cowardin et al. 1979).

Wetlands

Freshwater Emergent Wetland

This habitat type is perennially inundated or has perennially saturated soils. It occurs along the margins of and sometimes as small "islands" within riverine habitats, along drainages within the Merced NWR. It also occurs along the Eastside Bypass.

Table 3.5-2. Potential Wetlands and Other Waters of the United States

Waters of the United States	Cowardin[1] Classification	Total Acres (Footprint / 500-foot Buffer)
Wetlands		
Freshwater Emergent Wetland	PEM1[2]	0.04 / 23.53
Managed Wetland	PEM1	8.16 / 84.98
Saline Emergent Wetland	PEM1	0 / 5.85
Seasonal Wetland	PEM1	1.14 / 0.05
Valley Foothill Riparian	PFO[3]	0 / 7.48
Vernal Pool/Vernal Swale	PEM2	0.29 / 0.40
Wet Herbaceous	PEM1	0.22 / 51.37
	Wetland Total:	9.85 / 173.66
Other Waters		
Riverine (Perennial drainage and agricultural drainages)	Riverine	40.81 / 33.93
	Other Waters Total:	40.81 / 33.93
Total Area of Wetland Features:		57.45 / 207.59

Notes:
[1] Cowardin et al. (1979)
[2] PEM = Palustrine persistent emergent wetland
[3] PFO = Palustrine forested wetland

Managed Wetland

Hydrology and vegetation are heavily managed in some wetland areas within portions of the Merced NWR and a duck club north of the NWR. Vegetation within the managed wetlands within the Merced NWR includes narrow-leaf cattail (*Typha angustifolia*) and hardstem bulrush (*Schoenoplectus acutus*). Vegetation within the managed wetlands within the duck club includes swamp picklegrass (*Crypsis schoenoides*) and Baltic rush (*Juncus balticus*). Occurs within the Eastside Bypass south of Mariposa Bypass.

Saline Emergent Wetland

This habitat type is characterized by saline soils with low permeability that remain inundated or saturated for extended periods, creating a wetland environment. Common species include saltgrass, alkali heath, gumplant (*Grindelia stricta*), Baltic and Mexican rushes (*Juncus balticus*, *J. mexicanus*), and bulrushes (*Schoenoplectus* spp.).

Seasonal Wetland

Seasonal wetlands are ephemeral wetlands that pond or remain flooded for extended periods during a portion of the year, often the wet season, then may dry in spring or early summer. Seasonal wetlands occur in shallow depressions and are dominated by a mixture of native and non-native species.

Valley Foothill Riparian

Valley foothill riparian habitat is characterized by open to continuous tree canopy cover. This habitat is present adjacent to levees and located on high terraces. Valley foothill riparian habitat is characterized

by a moderately dense canopy of valley oak (Quercus lobata) with a predominantly herbaceous understory composed primarily of nonnative annuals. Fremont cottonwood, Oregon ash (*Fraxinus latifolia*), boxelder (*Acer negundo*), western sycamore (*Platanus racemosa*), and willows are also present.

Vernal Pool/Swale

Vernal swales are somewhat linear, concave depressions that form in topographically complex grasslands and commonly connect to vernal pools, *which are e*phemeral features and occur within a matrix of grassland characterized by mound and swale topography. Vegetation within vernal pools and swales is distinguished by a unique host of species adapted to the extreme conditions created by the inundation and drying cycles. Typical vegetation found in vernal pools and swales includes popcornflower (Plagiobothrys stipitatus), vernal pool buttercup (Ranunculus bonariensis var. trisepalus), coyote thistle (Eryngium vaseyi), and smooth goldfields (Lasthenia glaberrima).

Wet Herbaceous

Wet herbaceous habitat is characterized by annual and perennial herbaceous vegetation growing in areas with a high water table or subject to frequent flooding. These areas are typically wetter than annual grassland but not wet enough to be classified as freshwater emergent wetland. Common species in this habitat type include Bermuda grass (*Cynodon dactylon*), ryegrass, tarweed, and cocklebur (*Xanthium strumarium*). This habitat occurs throughout the project area.

Other Waters of the United States and State

Riverine

Characterized as intermittent or continually running water, typical of rivers and streams, and includes perennial and agricultural drainages as well as the Eastside Bypass. Agricultural drainages within the project area include artificially created drainage ditches, which periodically or continuously contain flowing water. Most drainage ditches within the croplands are unlined and highly disturbed because of routine maintenance with only scattered herbaceous vegetation or completely barren. Perennial or near-perennial drainage ditches within the Merced NWR support emergent vegetation. Agricultural drainages occur throughout the farmed areas.

Invasive Plants

Invasive plants are species that are introduced to a region, persist without human assistance, and have serious impacts on the natural environment (Davis and Thompson 2000). The California Invasive Plant Council (Cal-IPC) categorizes invasive plant species and maintains a list of species that have been designated as invasive in California. The term “noxious weed” is used by government agencies for non-native plants that have been defined as pests by law or regulation (California Department of Food and Agriculture [CDFA] 2010). Section 6.1.3 of the SJRRP Draft PEIS/R (SJRRP 2011), incorporated by reference, provides detailed information on the distribution and abundance of invasive plant species in the project area. For the predominant species, accounts of their ecology are provided in Appendix B, “Biological Resources – Vegetation and Wildlife Appendix.”

Distribution of Invasive Plants in the Project Area

Invasive species known to occur in the project area and their associated Cal-IPC category and CDFA rating are identified in **Table 3.5-3.** These species were identified during field surveys (DWR 2002; Reclamation 2011, 2012b). None of the species identified are listed as noxious weeds by the United

States Department of Agriculture (USDA). Species in the Cal-IPC "high" category are described in detail in Appendix B, "Biological Resources – Vegetation and Wildlife Appendix."

Table 3.5-3. Prevalent Invasive Plant Species in the Project Area

Scientific Name	Common Name	Cal-IPC Category[1]	CDFA Rating[2]
Terrestrial Species			
Brassica nigra	black mustard	moderate	--
Bromus diandrus	ripgut brome	moderate	--
Bromus madritensis ssp. *rubens*	foxtail brome	high	--
Centaurea solstitialis	yellow starthistle	high	C
Cirsium vulgare	bull thistle	moderate	C
Conium maculatum	poison hemlock	moderate	--
Cynodon dactylon	Bermuda grass	moderate	C
Festuca perennis	ryegrass	moderate	--
Hirschfeldia incana	short-pod mustard	moderate	--
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	moderate	--
Hordeum murinum ssp. *leporinum*	common foxtail	moderate	--
Lepidium latifolium	perennial pepperweed	high	B
Phalaris aquatica	harding grass	moderate	--
Ricinus communis	castor bean	limited	--
Sesbania punicea	red sesbania	high, red alert	B
Taeniatherum caput-medusae	Medusa head	high	C
Tamarix sp.	salt cedar	high	B
Aquatic Species			
Eichhornia crassipes	water hyacinth	high, red alert	C

Notes:

[1] California Invasive Plant Council Inventory (Cal-IPC) Categories:

- High – Have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- Moderate – Have substantial and apparent, but generally not severe, ecological impacts on physical processes, plant and animal communities, and vegetation structure. Reproductive biology and other attributes are conducive to moderate to high rates of dispersal, but establishment generally depends on ecological disturbance. Ecological amplitude and distribution range from limited to widespread.
- Limited – Invasive but ecological impacts are minor on a Statewide level, or not enough information was available to justify higher rating. Reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are limited, but these species may be locally persistent and problematic.
- Red Alert – Plants with the potential to spread explosively; infestations currently small and localized.

[2] California Department of Food and Agriculture (CDFA) Rating:

B – A pest of known economic or environmental detriment, and if present in California, it is of limited distribution. B-rated pests are eligible to enter the State if the receiving county has agreed to accept them. If found in the State, they are subject to State-endorsed holding action and eradication only to provide for containment, as when found in a nursery. At the discretion of the individual county agricultural commissioner, they are subject to eradication, containment, suppression, control, or other holding action.

C – A pest of known economic or environmental detriment, and if present in California, it is usually widespread. C-rated organisms are eligible to enter the State as long as the commodities with which they are associated conform to pest cleanliness standards when found in nursery stock shipments. If found in the State, they are subject to regulations designed to retard spread or to suppress at the discretion of the individual county agricultural commissioner. There is no State-enforced action other than providing for pest cleanliness.

Source: Cal-IPC 2006, CDFA 2010, U.S. Department of Agriculture 2017

Invasive Wildlife

Commonly occurring invasive wildlife known or potentially occurring within the project area includes bullfrog (*Lithobates catesbeianus),* crayfish (*Procambarus clarkii),* red-eared sliders (*Trachemys scripta elegans),* Asian clam (*Corbicula* spp.*),* and Chinese mitten crab (*Eriocheir sinensis).*

Special-status Species

For the purposes of this document, "special-status" has been defined to include those species that meet the definitions of rare or endangered plants or animals under CEQA, including species that are:

- Listed as Threatened or Endangered by USFWS pursuant to the ESA (50 CFR Section17.11 and Section17.12)
- Listed as Rare, Threatened, or Endangered by the California Department of Fish and Wildlife (CDFW) pursuant to the California Endangered Species Act (CESA) (California Fish and Game Code Section 2050, et seq.)
- Designated as Fully Protected under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code
- Designated by CDFW as California Species of Concern
- Listed as Category 1A, 1B, and 2 by the California Native Plant Society (CNPS)
- Not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA

Regionally occurring special-status species known to occur on the USGS 7.5-minute Turner Ranch, Sandy Mush, and Santa Rita Bridge quadrangles were obtained from CDFW (2017) and CNPS (2017). Federally listed species that could occur on or be affected by the project were obtained from USFWS (2017a). Habitat requirements for each special-status species were assessed and compared to the habitats occurring within the vicinity of the project area – which includes the length of the Eastside Bypass, extending out approximately 0.25 mile along either side (**Table 3.5-4)**.

Recovery Areas

Recovery plans describe reasonable actions that are believed to be required to recover and/or protect listed species. These plans often define recovery units and core habitat recovery areas to focus recovery efforts, and identify target areas to be conserved for the recovery and conservation objectives of each of the species addressed in the respective recovery plan(s).

California Red-legged Frog

While the project area occurs within the Sierra Nevada foothills and Central Valley recovery unit boundary for California red-legged frog (USFWS 2002), it does not occur within a core area. This species is assumed extirpated within the project area.

San Joaquin Kit Fox

The recovery plan identifies several core areas for the San Joaquin kit fox (USFWS 1998). One of these core recovery areas encompasses all of the project area (**Figure 3.5-2**).

Table 3.5-4. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Plants				
Atriplex cordulata heartscale	--/--/1B.2	Annual herb found in chenopod scrub, meadows and seeps, and valley and foothill grasslands with saline or alkaline soils. Blooms April-Oct. Elevation: 3 to 960 feet.	Present. Suitable habitat may be present in the inaccessible portions of the project area; known occurrences are present in the project area vicinity, including along the east side of the Reach O levee improvement area and on Chamberlin Road. (Reclamation 2017b)	Alkali desert scrub Perennial grassland Annual grassland
Atriplex minuscula lesser saltscale	--/--/1B.1	Annual herb found in chenopod scrub, playas, and valley and foothill grasslands with sandy, alkali soil. Blooms May-Oct. Elevation: 49 to 656 feet.	Present (Reclamation 2017b). Suitable habitat may be present in the inaccessible portions of the project area; known occurrences are present in the project area vicinity, including along West Chamberlin Road. (Reclamation 2017b)	Perennial grassland Annual grassland
Atriplex persistens vernal pool smallscale	--/--/1B.2	Annual herb found in alkali vernal pools. Blooms June-Oct. Elevation: 33 to 377 feet.	Medium. Suitable habitat is present in the project area, and known occurrences are present in the project area vicinity.	Vernal pools
Atriplex subtilis sublte orache	--/--/1B.2	Valley and foothill grassland up to 400 feet.	High. Suitable habitat may be present in the inaccessible portions of the project area; known occurrences are present in the project area vicinity.	Perennial grassland Annual grassland
Cordylanthus palmatus palmate-bracted Bird's Beak	FE/SE/1B.1	Alkaline; chenopod scrub, valley and foothill grassland.	Medium. Suitable habitat may be present in the inaccessible portions of the project area; no occurrences are present in the project area vicinity.	Perennial grassland Annual grassland
Delphinium recurvatum recurved larkspur	--/--/1B.2	Perennial herb occurring in chenopod scrub, cismontane woodland, and in alkali valley and foothill grassland. Blooms March-June. Elevation: 10 to 2,460 feet.	Medium. Suitable habitat is present in the project area, and known occurrences are present in the project area vicinity.	Perennial grassland Annual grassland
Eryngium racemosum delta button-celery	--/SE/1B.1	Annual or perennial herb found within vernally mesic clay depressions in riparian scrub habitat. Blooms June-Oct. Elevation: 10 to 98 feet.	Present. Documented at the Eastside Bypass Control Structure, Dan McNamara staging area, and near the Merced NWR Upper Weir (Reclamation 2017b). Suitable habitat is present in the Merced NWR and has been identified previously during plant surveys on the NWR.	Willow scrub/riparian scrub Valley foothill riparian
Euphorbia hooveri	-FT/--/1B.2	Annual herb found in	Medium. Suitable habitat is	Perennial grassland

Table 3.5-4. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Hoover's spurge	Critical Habitat	inland dune and sandy soils of valley and foothill grassland habitat. Blooms April-May. Elevation: 30 to 495 feet.	present in the project area, and known occurrences are present in the project area vicinity.	Annual grassland
Navarretia prostrata prostrate vernal pool navarretia	--/--/1B.1	Annual herb found in coastal scrub, meadows and seeps, valley and foothill grassland with alkaline soil, and vernal pools. Blooms April-June. Elevation: 49 to 2,297 feet.	Medium. Suitable habitat may be present in the project area, and there are known occurrences in the project area vicinity (i.e., Merced NWR).	Perennial grassland Annual grassland Vernal pools
Neostapfia colusana Colusa grass	FT/SE/1B.1 Critical Habitat	Annual herb found in large, deep vernal pools with adobe soil. Blooms May-Aug. Elevation: 16 to 656 feet.	Medium. Suitable habitat may be present in the inaccessible portions of the project area; known occurrences are present in the project area vicinity.	Vernal pools
Sagittaria sanfordii Sanford's arrowhead	--/--/1B.2	Perennial rhizomatous emergent herb found in assorted shallow freshwater marshes and swamps. Blooms May-Oct. Elevation: 0 to 2,133 feet.	Medium. Suitable habitat is present in the project area, and known occurrences are present in the project area vicinity.	Lacustrine Riverine/open water
Trichocoronis wrightii var. wrightii Wright's trichocoronis	--/--/2B.1	Alkaline areas of meadows and seeps, marshes and swamps, riparian forest, and vernal pools. Elevation: 16 to 1,427 feet.	Present. This species has a limited range. Documented near the Merced NWR Upper and Lower Weirs (Reclamation 2017b).	Lacustrine Riverine/open water Vernal pools Willow scrub/riparian scrub Valley foothill riparian
Invertebrates				
Branchinecta conservation Conservancy fairy shrimp	FE/--/-- Critical Habitat	Found in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.	Present. Suitable habitat is present in the project area vicinity. This species has been observed within the project area during past surveys and documented in the CNDDB.	Vernal pools/vernal swales Seasonal wetlands
Branchinecta lynchi vernal pool fairy shrimp	FT/--/-- Critical Habitat	Found in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.	Present. Suitable habitat is present in the project area vicinity. This species has been observed within the project area during past surveys and documented in the CNDDB.	Vernal pools/vernal swales Seasonal wetlands
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT/--/--	Breeds and forages exclusively on elderberry shrubs (*Sambucus* sp.) with steams at least 1 inch in diameter at ground level, typically associated with riparian	None. Habitat for this species (elderberry shrubs) may be present within the project area vicinity, but was not documented within 165 feet of project footprints (Reclamation 2017a).	Elderberry shrubs could occur in the project vicinity, Valley elderberry longhorn beetle most likely to occur in shrubs near valley foothill riparian

Table 3.5-4. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
		forests, riparian woodlands, elderberry savannas, and other Central Valley habitats. Occurs only in the Central Valley and adjacent foothills of California.		
Lepidurus packardi vernal pool tadpole shrimp	FE/--/-- Critical Habitat	Found in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands, which range in size from small, clear, well-vegetated vernal pools to highly turbid, alkali scald pools to large winter lakes.	Present. Suitable habitat is present in the project area, vicinity. This species has been observed within the project area during past surveys and documented in the CNDDB.	Vernal pools/vernal swales Seasonal wetlands
Amphibians				
Ambystoma californiense California tiger salamander (central population)	FT/ST/--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges and vernal pools or other seasonal water sources.	Present. Suitable habitat is present within the project area, with the exception of the active agricultural fields. This species has been observed within the project area during past surveys and documented in the CNDDB.	Vernal pools/vernal swales Seasonal wetlands Managed wetlands Annual grassland Perennial grassland
Rana pipiens Northern leopard frog	--/SSC/--		None. Although suitable habitat is present within the project area, there are no recorded occurrences of this species within the project area or immediate vicinity.	N/A
Rana draytonii California red-legged frog	FT/SSC/--	Breeds in slow moving streams, ponds, and marshes with emergent vegetation; forages in nearby uplands within about 200 feet. Extant records in the Sierra Nevada range are over 800 feet. Below this elevation, aquatic habitat supports stronger populations of non-native predators associated with warm water habitats such as bullfrogs and Centrarchid fish. Believed extirpated from the floor of the Central Valley prior to the 1960s.	None. Although suitable habitat is present within the project area, there are no recorded occurrences of this species within the project area or immediate vicinity. The project area occurs outside of the known extant geographic range for this species.	N/A

Table 3.5-4. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Spea hammondii western spadefoot	--/SSC/--	Occurs seasonally in grasslands, prairies, chaparral, and woodlands, in and around wet sites. Breeds in shallow, temporary pools formed by winter rains. Takes refuge in burrows.	Present. Suitable habitat is present throughout the project area, with the exception of the active agricultural fields. This species has been observed within the project area during past surveys and documented in the CNDDB.	Vernal pools/vernal swales Seasonal wetlands Managed wetlands Annual grassland Perennial grassland
Reptiles				
Actinemys marmorata western pond turtle	--/SSC/--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	Present. Suitable habitat is present throughout the project area, with the exception of the active agricultural fields. This species has been observed within the project area during past surveys and documented in the CNDDB.	Riverine/open water Lacustrine Freshwater emergent wetland
Gambelia sila blunt-nosed leopard lizard	FE/SE;SFP/--	Found in semiarid grasslands, alkali flats, and washes. Prefers flat areas with open space for running, avoiding densely vegetated areas. Habitat present north of the Mariposa Bypass and west of the Eastside Bypass.	Medium. Marginally suitable habitat is present north of the Mariposa Bypass and west of the Eastside Bypass within the project area; this species has not been observed despite numerous surveys conducted within portions of the project area.	Annual grassland north of the Mariposa Bypass and west of the Eastside Bypass
Thamnophis gigas giant garter snake	FT/ST/--	Found primarily in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields and occasionally in slow-moving creeks in California's interior.	High. Suitable habitat is present throughout the project area.	Riverine Freshwater emergent wetland Managed wetland Adjacent annual grassland Perennial drainage
Birds				
Agelaius tricolor tricolored blackbird	--/SC/--	Largely endemic to California, most numerous in the Central Valley and nearby vicinity. Typically requires open water, protected nesting substrate, and foraging grounds within vicinity of the nesting colony. Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water. Also nests in agricultural crops (e.g., silage), where	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Foraging: annual grassland Cropland Nesting: willow scrub/riparian scrub Valley foothill riparian

Table 3.5-4. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
		colonies are threatened during harvest.		
Ardea alba Great egret (rookery)	--/--/--	Great egrets nest in medium to large trees in communal nesting grounds called rookeries and return to these trees year after year.	Present. Suitable habitat is present throughout the project area vicinity; however, there are no recorded occurrences of this species within or adjacent to the project area.	Rookeries in willow scrub/riparian scrub Valley foothill riparian
Athene cunicularia burrowing owl	--/SSC/--	Found in open grasslands with low vegetation, golf courses, and disturbed/ruderal habitat in urban areas.	Present. Suitable habitat is present throughout the project area and there are recorded occurrences of this species within or adjacent to the project area.	Annual grassland Perennial grassland
Buteo swainsonii Swainson's hawk	--/ST/--	Forages in open and agricultural fields and nests in mature trees usually in riparian corridors.	Present. Suitable habitat is present throughout the project area, and this species was observed foraging and nesting during field surveys conducted in 2012.	Foraging: annual grassland Cropland Nesting: Valley foothill riparian and mature trees in the vicinity of aquatic waterways
Circus cyaneus northern harrier	--/SSC/--	Nests in wet meadows and tall grasslands, forages in grasslands and marshes.	Present. Suitable habitat is present throughout the project area, and this species was observed foraging during field surveys conducted in 2012.	Annual grassland Perennial grassland Wet herbaceous
Elanus leucurus white-tailed kite	--/SFP/--	Forages in open grasslands and agricultural fields and marshes. Nests in scattered mature trees within foraging habitat.	Present. Suitable habitat is present within the project area; although this species was not observed during the 2012 field surveys, there are recorded occurrences in the project area vicinity.	Valley foothill riparian and mature trees in the vicinity of cropland, annual grassland, and perennial grassland
Lanius ludovicianus loggerhead shrike	--/SSC/--	Inhabits a variety of woodland and open grassland habitats throughout California.	Present. Suitable habitat is present throughout the project area, and this species was observed foraging during field surveys conducted in 2012.	Throughout
Pelecanus erythrorhynchos American white pelican	--/SSC/--	Breeds primarily in the interior of North America, including areas of northern California. It forages in shallow, inland waters at the edge of marshes, lakes and rivers. During the winter, it roosts on the ground near the water's edge.	Present. Suitable habitat is present along the Eastside Bypass throughout the project area, and this species was observed foraging during field surveys conducted in 2012.	Foraging: managed wetlands Lacustrine Riverine/open water
Vireo bellii pusillus Least Bell's vireo	FE/SE/--	Typically occurs in structurally diverse riparian habitat with dense shrub layer; largely extirpated from the Central Valley	Medium. Suitable habitat is present within the project area; however, this species was not observed during the 2012 field surveys.	Nesting: Valley foothill riparian Willow scrub/riparian scrub

Table 3.5-4. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Xanthocephalus xanthocephalus Yellow-headed blackbird	--/SSC/--	Nests in shrubs near freshwater marshes or reedy lakes; during migration and winter, prefers open cultivated lands, fields, and pastures.	Present. Suitable habitat is present within the project area; however, this species was not observed during the 2012 field surveys.	Nesting: Valley foothill riparian Willow scrub/riparian scrub
Mammals				
Dipodomys nitradoides exilis Fresno kangaroo rat	FE/SE/--	Restricted to native grasslands in Fresno County within the San Joaquin Valley. Prefers arid, often strongly alkaline, flat plains with sparse vegetation of grasses and alkali forbs.	Low. Suitable habitat is available throughout the project area, with the exception of the active agricultural fields. However, there are no recorded occurrences of this species in project area vicinity, and this species was not captured during trapping events conducted in the lower portion of the Eastside Bypass (Reclamation 2016).	Annual grassland Perennial grassland
Eumops perotis californicus western mastiff bat	--/SSC/--	Cliff-dwelling species that roosts under exfoliating rock slabs (e.g., granite, sandstone or columnar basalt) and in crevices in large boulders and buildings. Roosts are generally high above the ground, usually allowing a clear vertical drop of at least 30 feet below the entrance for flight. Most frequently encountered in broad open areas, and foraging habitat includes dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas.	Medium. Suitable foraging habitat was noted in the project area; however, there are no recorded occurrences within or adjacent to the project area.	Foraging: cropland Annual grassland Perennial grassland
Sylvilagus bachmani riparius riparian brush rabbit	FE/SE/--	Found in dense, brushy areas of Central Valley riparian forests, marked by extensive thickets of wild rose (*Rosa* spp.), blackberries (*Rubus* spp.), and willows (*Salix* spp.).	None. Suitable habitat is available within the project vicinity where a riparian corridor is present. However, no riparian or scrub habitat occurs within the project footprint.	Valley foothill riparian Willow scrub/riparian scrub
Taxidea taxus American badger	--/SSC/--	Found in dry, open grasslands, fields, and pastures. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Present. Suitable habitat is available throughout the project area vicinity.	Annual grassland Perennial grassland

Table 3.5-4. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Vulpes macrotis mutica San Joaquin kit fox	FE/ST/--	Grassland or grassy open stages with scattered shrubby vegetation; requires loose textured sandy soils for burrowing; requires suitable prey base of small rodents.	Medium. Suitable foraging habitat is available throughout the project area. No dens were observed during the 2012 surveys, although this species was documented in the project vicinity in the 1980s. The species may use the project area as a movement corridor to more suitable denning habitat.	Annual grassland Perennial grassland

Notes: CNDDB = California Natural Diversity Database; CRPR = California Rare Plant Rank, CDF-S = Department of Forestry & Fire Protection – Sensitive

Legal Status Definitions:

Federal

FE Species listed as Endangered under the Federal Endangered Species Act.
FT Species listed as Threatened under the Federal Endangered Species Act.
– No listing under the Federal Endangered Species Act.

State

SSC Species identified as a candidate species for listing as threatened or endangered under the California Endangered Species Act.
SE Species listed as Endangered under the California Endangered Species Act.
ST Species listed as Threatened under the California Endangered Species Act.
SFP Species listed as Fully Protected under the California Fish and Game Code.
SSC Species listed as Species of Special Concern by the California Department of Fish and Wildlife.
– No listing under the California Endangered Species Act.

CRPR / California Rare Plant Rank

1B Plant species considered Rare, Threatened, or Endangered in California and elsewhere.
2B Plant species considered Rare or Endangered in California but more common elsewhere.
California Rare Plant Rank Extensions:
.1 Seriously threatened in California (greater than 80 percent of occurrences are threatened and/or have a high degree and immediacy of threat).
.2 Moderately threatened in California (20 to 80 percent of occurrences are threatened and/or have a moderate degree and immediacy of threat).

Sources: California Department of Fish and Wildlife 2017; California Native Plant Society 2017; U.S. Fish and Wildlife Service 2017a; data collected and compiled by GEI Consultants Inc. in 2017

Vernal Pool Species

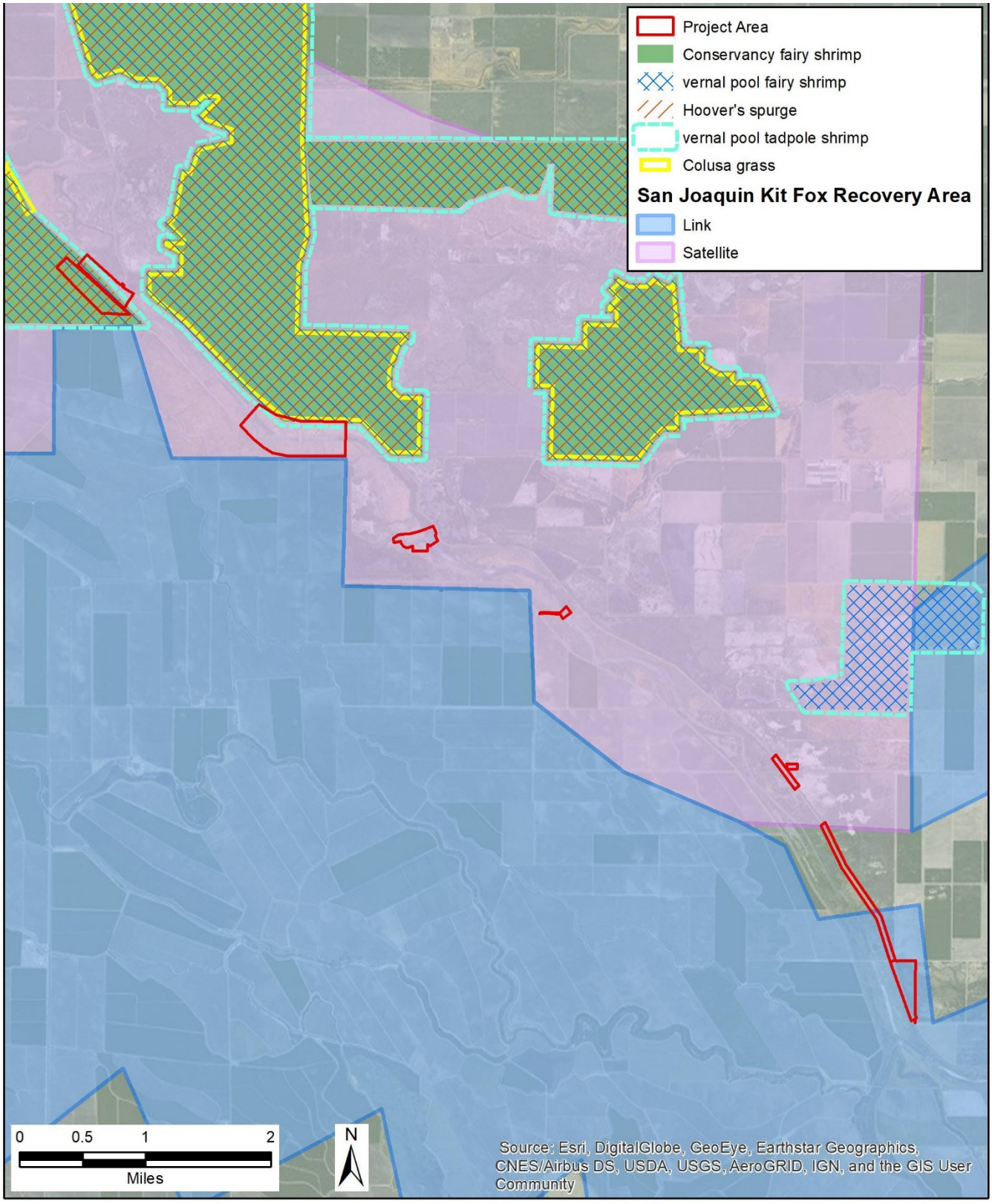
The San Joaquin Valley vernal pool region is a vernal pool species recovery unit that includes the Eastside Bypass (USFWS 2005a). Associated within this vernal pool region is the Grasslands Ecological Area core area. Portions of this core area are within the project area.

Designated Critical Habitat within the Project Area

Vernal Pool Species

There are several designated critical habitat units for vernal pool species, including Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Hoover's spurge, within portions of the project area (USFWS 2003, 2005b, 2005c, 2006; see also Appendix B, "Biological Resources – Vegetation and Wildlife Appendix") (**Figure 3.5-2**).

Figure 3.5-2. Designated Critical Habitat and Recovery Areas within Project Area



Source: CDM Smith, 2017

Sensitive Natural Communities

Sensitive natural communities include those that are of special concern to resource agencies, such as the CDFW, USACE, or USFWS, or are afforded specific consideration through CEQA, Section 1602 of the California Fish and Game Code, Section 404 of the Federal CWA, and the Porter-Cologne Act, as discussed below in Section 3.5.2, "Regulatory Setting." The following habitat types within the project area are considered sensitive natural communities: alkali desert scrub, riparian scrub, willow scrub, freshwater emergent wetland, saline emergent wetland, seasonal wetland, vernal pool, vernal swale, wet herbaceous, lacustrine, and riverine. The acreages of these habitat types are summarized in **Table 3.5-1**.

3.5.2 Regulatory Setting

Federal

Federal Endangered Species Act

The Federal ESA grants protection over species that are formally listed as threatened, endangered, or proposed. The primary protective requirement in the case of projects requiring Federal permits, authorizations, or funding, is Section 7 of ESA, which requires Federal lead agencies to consult (or "confer" in the case of proposed species or proposed critical habitat) with USFWS and NMFS (where marine or certain anadromous species may be affected) to ensure that their actions do not jeopardize the continued existence of Federally listed species or their designated critical habitats. In addition to Section 7 requirements, Section 9 of the ESA protects listed wildlife species from "take." Take is broadly defined as those activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect [a protected species], or attempt to engage in any such conduct." An activity can be in violation of take prohibitions even if the activity is unintentional or accidental. Adverse modification or destruction of designated critical habitat for listed species, or activities that prevent or significantly impair essential behavioral patterns, including breeding, feeding, or sheltering, are also considered "take" under the ESA. Federal agencies may receive authorization for the incidental take of listed species under Section 7 through the issuance of a Biological Opinion from USFWS and/or NMFS. For this project, Reclamation is the lead Federal agency responsible for consultation with USFWS and NMFS under Section 7. Federally listed species and designated critical habitat occur within the project area.

Fish and Wildlife Coordination Act

FWCA requires agencies to consult with USFWS when it plans to conduct, license, or permit an activity involving the impoundment, diversion, deepening, control, or modification of a stream or body of water. The Act also requires consultation with the head of the state agency that administers wildlife resources in the affected state. The purpose of this process is to promote conservation of wildlife resources by preventing loss of and damage to such resources and to provide for the development and improvement of wildlife resources in connection with the agency action. The proposed project includes the modification of instream structures and levees and is therefore subject to FWCA.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 makes it unlawful to take or attempt to take, kill, or possess any migratory bird, any part, nest, or egg of any such bird except under the terms of a permit issued by the United States Department of the Interior. A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. Numerous birds covered by the Migratory Bird Treaty Act are present in the project area.

Clean Water Act

The CWA established the basic structure for regulating discharges of pollutants into waters of the United States. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industrial and municipal dischargers. The CWA provides the legal framework for several water quality regulations, including National Pollutant Discharge Elimination System (NPDES) permits, effluent limitations, water quality standards, pretreatment standards, antidegradation policy, nonpoint source discharge regulation, and wetlands protection. EPA has delegated the responsibility for administration of portions of the CWA to state and regional agencies. The CWA also continued requirements to set water quality standards for all known contaminants in surface waters. The CWA made it unlawful for any person to discharge any pollutant from a point source into Waters of the United States unless a permit was obtained under its provisions. Waters of the United States are present in the project area.

Section 401

Section 401 of the CWA requires that an applicant for a Federal license or permit to discharge into navigable waters must provide the Federal agency with a water quality certification, declaring that the discharge would comply with water quality standards requirements of the CWA. USACE issuance of a Section 404 permit triggers the requirement that a Section 401 certification also be obtained. In California, RWQCBs issue this certification.

Section 402

Section 402 of the CWA creates the NPDES permit program. This program covers point sources of pollution discharging into a surface waterbody.

Section 404

Section 404 of the CWA requires a permit to be obtained from USACE for the discharge of dredged or fill material into “waters of the United States, including wetlands.” Waters of the United States include wetlands and lakes, rivers, streams, and their tributaries. Wetlands are defined for regulatory purposes as areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, vegetation typically adapted for life in saturated soil conditions.

Executive Order 11312: Invasive Species

Executive Order 11312 (February 3, 1999) directs all Federal agencies to prevent and control introductions of invasive non-native species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. Executive Order 11312 established a national Invasive Species Council made up of Federal agencies and departments and a supporting Invasive Species Advisory Committee composed of State, local, and private entities. The Invasive Species Council and Advisory Committee oversee and facilitate implementation of the Executive Order, including preparation of a National Invasive Species Management Plan. This is a key area of concern for all SJRRP projects because construction disturbance and Restoration Flows have the potential to spread invasive species.

National Wildlife Refuge System Administration Act/National Wildlife Refuge System Improvement Act

The National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) was recently amended by Public Law 105-57, "The National Wildlife Refuge System Improvement Act of 1997." This new law amends and builds upon the 1966 Act to ensure that the National Wildlife Refuge System is managed as a national system of related lands, waters, and interests for the protection and conservation of the Nation's wildlife resources. The 1966 Act provides guidelines and directives for administering and managing all areas in the system, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas." The Act's main components include: a strong and singular wildlife conservation mission for the Refuge System; a requirement that the Secretary of the Interior maintain the biological integrity, diversity, and environmental health of the Refuge System; a new process for determining compatible uses of refuges; a recognition that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when determined to be compatible, are legitimate and appropriate public uses of the Refuge System; compatible wildlife-dependent recreational uses that are the priority general public uses of the Refuge System; and a requirement for preparing comprehensive conservation plans (CCPs).

Comprehensive Conservation Plans for National Wildlife Refuges

USFWS is directed to develop CCPs to guide the management and resource use for each refuge of the NWR System under requirements of the NWR Improvement Act of 1997. Refuge planning policy also directs the process and development of CCPs. A CCP describes the desired future conditions and long-range guidance necessary for meeting refuge purposes. It also guides management decisions and sets forth strategies for achieving refuge goals and objectives within a 15-year time frame. Several important NWRs are present along the San Joaquin River and elsewhere in the San Joaquin Valley.

The CCPs for the NWRs are relevant to the Project because portions of the Merced NWR are present within the project area. Merced NWR has a draft CCP that is nearing completion and approval (USFWS 2017b). The primary goals of the refuge are to: provide feeding and resting habitat for migrating and wintering waterfowl and other waterbirds; provide habitat and management for endangered species, threatened species, and/or species of special concern; preserve the natural diversity of the flora and fauna representative of the lower San Joaquin Valley and the natural processes that maintain that diversity; provide high-quality wildlife-dependent recreation and environmental education programs; and alleviate crop depredation.

State

California Endangered Species Act

Section 2080 of the CESA prohibits “take” of State-listed threatened and endangered species. The CESA defines take as any action or attempt to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill any listed species. If a proposed project may result in “take” of a listed species, a permit pursuant to pursuant to Fish and Game Code Section 2081(b) is required from the CDFW. Take of State-listed species is authorized through Section 2081 through a permit process. Take can also be authorized through Section 2835 with an approved Natural Community Conservation Plan. State-listed species occur within the project area.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (Fish and Game Code Sections 1900–1913) is intended to preserve, protect, and enhance endangered or rare native plants in California and gives the CDFW authority to designate state endangered, threatened, and rare plants and provides specific protection measures for identified populations. The Act also directs the California Fish and Game Commission to adopt regulations governing taking, possessing, propagation, and sale of any endangered or rare native plant. State-listed and rare plants occur within the project area.

California Native Plant Society

The CNPS is a professional society of plant biologists, scientists, and associated professionals that has accumulated a statewide database on California native plants and their distributions. The CNPS has created five categorical rankings of plants to identify their respective concern for these species as potential rare, threatened, or endangered species. These listings do not afford legal status nor protection for the species, but the lists are utilized by agencies in their planning processes for activities that could impact the species or habitat. Vascular plants listed as rare or endangered by the CNPS (CNPS 2012) are defined as follows:

- California Rare Plant Rank 1A: Plants presumed extinct in California
- California Rare Plant Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
- California Rare Plant Rank 2A: Plants presumed extirpated in California but common elsewhere
- California Rare Plant Rank 2B: Plants rare, threatened, or endangered in California but more common elsewhere
- California Rare Plant Rank 3: Plants about which we need more information – a review list
- California Rare Plant Rank 4: Plants of limited distribution – a watch list

Further, there are two extensions to these California Rare Plant Ranks: (1) .1 is considered seriously threatened in California (greater than 80 percent of occurrences are threatened and/or have a high degree and immediacy of threat) and (2) .2 is considered moderately threatened in California (20 to 80 percent of occurrences are threatened and/or have a moderate degree and immediacy of threat).

In general, plants appearing on California Rare Plant Rank (CRPR) Lists 1A, 1B, or 2 are considered to meet the criteria of endangered, rare, or threatened under the CEQA Guidelines Section 15380. Additionally, plants identified on CNPS Lists 1A, 1B, or 2 meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (CESA) of the California Fish and Game Code as rare or endangered species. Plants identified by CNPS as endangered, threatened, or rare occur within the project area.

California Fish and Game Code Sections 1600–1603, Lake and Streambed Alteration

These sections of the Fish and Game Code require notifying CDFW prior to any project activity that would substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into

any river, stream, or lake. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the floodplain of a body of water. The project would affect the bed, channel, and bank of the Eastside Bypass.

California Fish and Game Code Section 3503, Bird Nests and Birds of Prey

Bird nests are protected in California under Section 3503 of the California Fish and Game Code. Section 3503 states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Disturbance during the breeding season can result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered take by CDFW. CDFW may issue permits authorizing take.

Section 3503.5 of the Code specifies that it "is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Birds of prey are present in the project area.

California Fish and Game Code Sections 3511, 4700, 5050, and 5515, Fully Protected Species

Four sections of the California Fish and Game Code—Sections 3511, 4700, 5050, and 5515—list 37 fully protected species. These statutes prohibit take or any possession of fully-protected species. CDFW is unable to authorize incidental take of fully-protected species when activities are proposed in areas inhabited by those species. CDFW has informed non-Federal agencies and private parties that they must avoid take of any fully protected species in carrying out projects. Two fully protected species – blunt-nosed leopard lizard and white-tailed kite – may occur in the project area.

California Fish and Game Code Section 3513, Taking Migratory Bird Treaty Act Birds

Section 3513 of the Code states that "it is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act." Numerous birds covered by the Migratory Bird Treaty Act are present in the project area.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act was enacted in 1969 and established the SWRCB. The Porter-Cologne Act defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. Unlike the CWA, the Porter-Cologne Act applies to both surface and groundwater. The Porter-Cologne Act requires that each of nine semi-autonomous RWQCB establish water quality objectives while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. The project area is located within the Central Valley Region, which is the jurisdiction of the Central Valley RWQCB. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per Federal CWA regulations. Therefore, the regional plans provide the regulatory framework for meeting State and Federal requirements for water quality control. Changes in water quality are only allowed if the change is consistent with the most restrictive beneficial use designation identified by the State, does not

unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans (RWQCB 2016). Project construction activities would need to be conducted in compliance with the Porter-Cologne Act.

Special-status Natural Communities

Special-status natural communities are identified as such by the CDFW's Natural Heritage Division and include those that are naturally rare and those whose extent has been greatly diminished through changes in land use. While there is no statewide law that requires protection of all special-status natural communities, CEQA requires consideration of the potential impacts of a project on biological resources of statewide or regional significance. Special-status natural communities are present in the project area.

Local

Merced County General Plan

The *2030 Merced County General Plan* (County of Merced 2013) includes a plan for the comprehensive and long-range management, preservation, and conservation of "open-space lands" and contains provisions for managing and conserving Merced County's natural resources and for protecting life, health, and property from natural hazards. Policies associated with implementing these goals are designed to ensure that the development of Merced County will not substantially interfere with or destroy valuable natural resources, and that development will occur with recognition of sensitive resources. The project occurs within Merced County.

3.5.3 Environmental Effects

Impact Assessment Methodology

The evaluation of effects on vegetation and wildlife is based on field investigations; review of existing biological resources documented in or near the project area; information obtained from the USFWS (2017a), CNPS (2017), and CDFW (2017) species lists; review of aerial photographs; and review of the Geomorphology, Sediment Transport, and Vegetation Assessment, Appendix N of the SJRRP Draft PEIS/R. Impacts on biological resources were determined by evaluating the project plans in relation to the habitat characteristics of the project area, quantifying potential loss of habitat types, and evaluating potential effects of habitat loss to special-status species. Impacts to habitat types are based on the project footprint identified in **Table 3.5-1** and illustrated on **Figure 3.5-1**. Mitigation measures are consistent with, and adapted from, the Conservation Measures included in the SJRRP Draft PEIS/R (SJRRP 2011). All mitigation measures would be implemented by DWR and/or Reclamation.

No Action Alternative

Under the no action alternative, no construction-related activities would occur and no existing facilities would be modified. There would be no construction-related impacts. Most if not all species would benefit from the increase in Restoration Flows in the Eastside Bypass from a maximum of approximately 300 cfs under existing conditions to a maximum of approximately 580 cfs under the no action alternative. No significant adverse impacts to biological resources would occur from this increase in Eastside Bypass flows.

Proposed Action

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?
(Less-than-Significant with Mitigation Incorporated)

Substantially Affect Special-status Plant Species

The proposed project could impact special-status plant species in upland and aquatic habitats if present within the construction footprint through the removal of plants and their habitat (see **Table 3.5-1**). Occurrences of Delta button-celery *(Eryngium racemosum),* Parry's rough tarplant (*Centromadia parryi* subsp. *rudis*), Wright's trichocoronis *(Trichocoronis wrightii var. wrightii),* heartscale *(Atriplex cordulata),* and lesser saltscale (*Atriplex minuscula)* were recently documented in the project area, around the Eastside Bypass control structure (Delta button celery, Parry's rough tarplant), Dan McNamara Road (Delta button celery), the weirs (Delta button celery, Wright's trichoniosis), and levee Reaches O-3 and O-4 (heartscale, lesser saltscale) (Reclamation 2017b). Therefore, this impact would be potentially significant.

However, DWR and/or Reclamation will implement mitigation measures BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures PLANTS-1 and 2; DBC-1, 2, and 3; and VP-1, 2, and 3, respectively) to avoid impacts to special-status plants by establishing a 100-foot buffer between construction activities and upland plants, and a 250-foot buffer between construction activities and vernal pools containing vernal pool plants, if feasible, or compensate for impacts through consultation with USFWS and/or CDFW if avoidance is infeasible.

Mitigation Measure BIO-1: Avoid and Minimize Effects to Special-status Plants.

a) Within 1 year before the commencement of ground-disturbing activities, habitat assessment surveys for special-status plants will be conducted by a USFWS_ and CDFW-approved botanist, in accordance with the most recent USFWS and CDFW guidelines and at the appropriate time of year when the target species would be in flower or otherwise clearly identifiable. Survey results can be climate dependent, and survey timing will be coordinated with USFWS and CDFW.

a) Locations of special-status plant populations will be clearly identified in the field by staking, flagging, or fencing a minimum 50-foot-wide buffer (100-foot-wide buffer for any elderberry bushes) around them before the commencement of activities that may cause disturbance. No activity shall occur within the buffer area if feasible. If encroachment within the buffer is required, USFWS and/or CDFW will be consulted to determine appropriate compensation measures for the loss of special-status plants, as appropriate. Worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented.

b) Some special-status plant species are annual plants, meaning that a plant completes its entire life cycle in one growing season. Other special-status plant species are perennial plants that return year after year until they reach full maturity. Because of the differences in plant life histories, all general conservation measures will be developed on a case-by-case basis and

will include strategies that are species- and site-specific to avoid impacts to special-status plants.

Mitigation Measure BIO-2: Compensate for Temporary and Permanent Loss of Special-status Plants.

a) USFWS and/or CDFW will be consulted to determine appropriate compensation measures for the loss of special-status plants, as appropriate.

b) Appropriate mitigation measures may include the creation of off-site populations through seed collection or transplanting, preservation and enhancement of existing populations, restoration or creation of suitable habitat, or the purchase of credits at an approved mitigation bank. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in the mitigation plan. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.

Mitigation Measure BIO-3: Avoid and Minimize Loss of Habitat and Individuals.

a) Historically, Delta button-celery was known to exist in the Eastside and Mariposa Bypasses (CNDDB). Before conducting project activities, comprehensive surveys will be conducted. Surveys will include remapping and re-census of the documented occurrences during at least 2 consecutive or nonconsecutive years when habitat conditions are favorable to detect the species to determine the population trend. Status updates for these occurrences will be provided to CDFW and USFWS, as appropriate.

b) A Delta button-celery conservation plan will be developed and implemented that includes a preservation and adaptive management strategy for existing occurrences within the Restoration Area. The conservation plan will be developed in collaboration with CDFW and other species experts, and be supported by review of the existing literature, including information on species' life history characteristics, historic and current distribution, and microhabitat requirements.

Mitigation Measure BIO-4: Avoid and Minimize Loss of Habitat and Risk of Take of Delta Button-celery for Implementation of Construction Activities.

a) If direct impacts to Delta button-celery could occur, DWR will consult with CDFW to determine specific minimization and mitigation measures.

Mitigation Measure BIO-5: Compensate for Temporary or Permanent Loss of Delta-button Celery Habitat.

a) If pre-construction surveys find populations that cannot be avoided, compensatory mitigation for Delta button-celery will be developed by DWR in consultation with CDFW, as appropriate. Mitigation may include the development and implementation of habitat creation and enhancement designs to incorporate habitat features for Delta button-celery (e.g., depressions within seasonally inundated areas) into floodplains with potentially suitable

habitat conditions. Compensatory mitigation may also include efforts to establish additional populations in the Restoration Area or to enhance existing populations on or off site. Mitigation sites will avoid areas where future SJRRP construction activities are likely.

b) Establishment of new occurrences will be attempted by transplanting seed and plants from affected locations to created habitat or suitable, but unoccupied, existing habitat.

c) Monitoring, performance criteria, and protective measures will be applied to compensatory mitigation sites. The replacement requirements, and any additional conservation and mitigation measures will be determined in consultation with CDFW.

Mitigation Measure BIO-6: Avoid Effects to Vernal Pool Species.

a) Where vernal pools or vernal pool species occur within 250 feet of the project footprint, a biologist approved by USFWS and CDFW will identify and map vernal pool and seasonal wetland habitat potentially suitable for listed vernal pool plants, invertebrates, and western spadefoot toad within the project footprint.

b) Facility construction and other ground-disturbing activities will be sited to avoid core areas identified in the *Vernal Pool Recovery Plan* (USFWS 2005), where feasible, because conservation of these areas is a high priority for recovering listed vernal pool species. If encroachment within a core area is required, USFWS will be consulted and CDFW coordinated with to determine appropriate compensation measures for the loss of vernal pool species, as appropriate.

Mitigation Measure BIO-7: Minimize Effects to Vernal Pool Species.

a) Where vernal pools are present, a buffer around the micro-watershed or a 250-foot-wide buffer, whichever is greater, will be established if feasible before ground-disturbing activities around the perimeter of vernal pools and seasonal wetlands that provide suitable habitat for vernal pool crustaceans or vernal pool plants. This buffer will remain until ground-disturbing activities in that area are completed. Suitable habitat and buffer areas will be clearly identified in the field by staking, flagging, or fencing. If encroachment within the buffer is required, USFWS will be consulted and CDFW will be coordinated with to determine appropriate compensation measures for the loss of vernal pool species, as appropriate.

b) High-visibility fencing will be placed and maintained around all preserved vernal pool habitat buffers during ground-disturbing activities to prevent impacts from vehicles and other construction equipment.

c) Worker awareness training and on-site biological monitoring by USFWS- and CDFW-approved biologists will occur during ground-disturbing activities to ensure buffer areas are being maintained.

Mitigation Measure BIO-8: Compensate for Temporary or Permanent Loss of Vernal Pool Species Habitat.

a) If project activities occur within the micro-watershed or 250-foot-wide buffer for vernal pool habitat, a compensatory mitigation plan will be developed and implemented, consistent with

USACE and EPA April 10, 2008, *Final Rule for Compensatory Mitigation for Losses of Aquatic Resources* (33 CFR Parts 325 and 332 and 40 CFR Part 230) and other applicable regulations and rules at the time of implementation, that will result in no net loss of acreage, function, and value of affected vernal pool habitat. Unavoidable effects will be compensated through a combination of creation, preservation, and restoration of vernal pool habitat or purchase of credits at a mitigation bank approved by the applicable regulatory agency/agencies.

b) Project effects and compensation will be determined in consideration of the *Vernal Pool Recovery Plan* goals for core areas, which call for 95 percent preservation for habitat in the Grasslands Ecological Area and Madera core areas, and 85 percent habitat preservation in the Fresno core area (USFWS 2005).

c) Appropriate compensatory ratios for loss of habitat both in and out of core areas will be determined during coordination and consultation with USFWS and coordination with CDFW, as appropriate.

d) If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be and developed as part of the USFWS consultation and CDFW coordination process. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.

Implementation of these mitigation measures would reduce the potentially significant impact on special-status plant species to a less-than-significant impact level.

Substantially Reduce Habitat or Populations of Special-status Wildlife

As further discussed below, the proposed project could impact special-status wildlife potentially occurring in the action area through removal of vegetation, excavation and grading of uplands and channels, and equipment operation. Potentially affected special-status wildlife are discussed below.

Vernal Pool Branchiopods and Western Spadefoot

Presence is assumed for Federally listed vernal pool branchiopods where vernal pools are present. However, vernal pools that occur within the floodplain may not support suitable habitat for vernal pool branchiopods. Project actions could indirectly impact vernal pool branchiopods and western spadefoot if construction activities occur within 250 feet of vernal pools. Therefore, this impact would be potentially significant.

However, with implementation of mitigation measures BIO-6, BIO-7, and BIO-8 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures VP-1, 2, and 3, respectively), impacts to these species would be avoided by establishing a 250-foot buffer between construction activities and vernal pools, if feasible, or addressed through the Section 7 consultation with USFWS. If avoidance is infeasible, compensation may be necessary and may include dedication of offsite conservation easements or purchase of mitigation credits.

Mitigation Measure BIO-6: Avoid Effects to Vernal Pool Species.

Please refer to Mitigation Measure BIO-6 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

Mitigation Measure BIO-7: Minimize Effects to Vernal Pool Species.

Please refer to Mitigation Measure BIO-7 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

Mitigation Measure BIO-8: Compensate for Temporary or Permanent Loss of Vernal Pool Species Habitat.

Please refer to Mitigation Measure BIO-8 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

California Tiger Salamander

Presence is assumed for California tiger salamander. Project activities could impact upland habitat (i.e., annual grassland) and aquatic habitat (i.e., wetlands and vernal pools) where these habitat types occur within the footprint where ground-disturbing activities would occur (see **Table 3.5-1**). Therefore, this impact would be potentially significant.

However, with implementation of mitigation measures BIO-9, BIO-10, and BIO-11 (identified in the SJRRP Draft PEIS/R as Conservation Measure CTS-1, 2, and 3, respectively), impacts to this species would be avoided or minimized through establishing a 250-foot buffer between construction activities and burrows within 1.3 miles of known or potential breeding habitat and having a biological monitor present during construction activities, if feasible. If encroachment within the buffer is required, USFWS and CDFW will be consulted to determine appropriate compensation measures for the loss of this species, as appropriate. Compensation may involve creation, preservation, and/or restoration of habitat or purchase of credits at a mitigation bank approved by the regulatory agencies if avoidance is infeasible.

Mitigation Measure BIO-9: Avoid Effects to California Tiger Salamander.

a) Prior to project construction activities, a biologist approved by USFWS and CDFW will identify and map potential California tiger salamander habitat (areas within 1.3 miles of known or potential California tiger salamander breeding habitat) within the project footprint. Prior to ground-disturbing activities, the approved biologist will survey for and flag the presence of ground squirrel and gopher burrow complexes. Where burrow complexes are present, a 250-foot-wide buffer shall be placed to avoid and minimize disturbance to the species.

b) Facility construction and other ground-disturbing activities shall be sited to avoid areas of known California tiger salamander habitat and avoidance buffers will be implemented if feasible. If encroachment within a buffer is required, USFWS and CDFW will be consulted with to determine appropriate compensation measures for the loss of California tiger salamander, as appropriate.

c) To eliminate an attraction to predators of the California tiger salamander, all food-related trash items such as wrappers, cans, bottles, and food scraps, must be disposed of in closed containers and removed at least once every day from the entire project site.

Mitigation Measure BIO-10: Minimize Effects to California Tiger Salamander.

a) Before the start of construction activities, approved construction exclusion fencing will be installed just outside the work limit or around vernal pools where California tiger salamander may occur. This fencing will be maintained throughout construction and will be removed at the conclusion of ground-disturbing activities. No vehicles will be allowed beyond the exclusion fencing. A USFWS- and CDFW-approved biological monitor will be present on site, during intervals recommended by USFWS and CDFW, to inspect the fencing.

b) The approved biological monitor will be on site each day during any wetland restoration or construction, and during initial site grading or development of sites in suitable habitat for California tiger salamander.

c) Before the start of work each day, the biological monitor will check for animals under any equipment to be used that day, such as vehicles or stockpiles of items such as pipes. If California tiger salamanders are present, they will be allowed to leave on their own, before the initiation of construction activities for the day. To prevent inadvertent entrapment of California tiger salamanders during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered by plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals.

d) Plastic monofilament netting (erosion control matting) or similar material shall not be used at the project site because California tiger salamanders may become entangled or trapped. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

e) All ground-disturbing work will occur during daylight hours. Clearing and grading will be conducted between May 1 and October 1, where feasible, in coordination with USFWS and CDFW, and depending on the level of rainfall and site conditions. If infeasible, USFWS and CDFW will be consulted with to determine appropriate compensation measures for the loss of California tiger salamander habitat, as appropriate.

f) Revegetation of project areas temporarily disturbed by construction activities will be conducted with locally occurring native plants.

Mitigation Measure BIO-11: Compensate for Temporary or Permanent Loss of California Tiger Salamander Habitat.

a) If California tiger salamander, or areas within 1.3 miles of known or potential California tiger salamander breeding habitat, would be affected by the proposed project, a compensatory mitigation plan will be developed and implemented in coordination with USFWS and CDFW, as appropriate. Unavoidable effects will be compensated through a combination of creation, preservation, and restoration of habitat or purchase of credits at an approved mitigation bank.

b) If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in and developed as part of the USFWS and CDFW coordination and consultation process. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.

Giant Garter Snake

The proposed project could impact giant garter snake and its upland habitat (i.e., annual grassland) and aquatic habitat (i.e., wetlands) where these habitat types occur within the construction footprint through removal of vegetation, channel grading, equipment usage, and levee improvements (see **Table 3.5-1**). Therefore, this impact would be potentially significant.

However, with implementation of mitigation measures BIO-12 and BIO-13 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures GGS-1 and -2, respectively), impacts would be avoided or minimized through conducting preconstruction surveys within 24 hours of activities, establishing 300-foot buffers around potentially suitable aquatic habitat, hand-clearing vegetation where giant garter snake is suspected to occur, dewatering a minimum of 2 weeks prior to the start of in-water work, and limiting the work period to occur between May 1 and October 1. If avoidance of impacts to this species is not feasible, impacts would be addressed through consultation with USFWS and coordination with CDFW, and unavoidable impacts would be compensated for through preservation and enhancement of existing populations, restoration or creation of suitable habitat, or purchase of credits at a mitigation bank at a ratio approved by USFWS and CDFW.

Mitigation Measure BIO-12: Avoid and Minimize Loss of Giant Garter Snake Habitat.

a) Where suitable giant garter snake habitat occurs within the project area, preconstruction surveys by a qualified biologist approved by USFWS and CDFW will be completed within a 24-hour period before any ground disturbance of potential giant garter snake habitat. If construction activities stop on the project site for a period of 2 weeks or more, a new giant garter snake survey will be completed no more than 24 hours before the restart of construction activities. Avoidance of suitable giant garter snake habitat, as defined by USFWS and CDFW, will occur by demarcating and maintaining a 300-foot-wide buffer around these areas. All potentially suitable burrows and crevices will be flagged and avoided by a minimum 50-foot, no-disturbance buffer.

b) For projects within potential giant garter snake habitat, all activity involving disturbance of potential giant garter snake habitat will be restricted to the period between May 1 and October 1, the active season for giant garter snakes, if feasible. The construction site will be reinspected if a lapse in construction activity of 2 weeks or greater has occurred. If disturbance of potential giant garter snake habitat cannot be avoided, USFWS will be consulted and CDFW coordinated with to determine appropriate compensation measures for the loss of giant garter snake habitat, as appropriate.

c) Clearing will be confined to the minimal area necessary to facilitate construction activities. Giant garter snake habitat within or adjacent to the project will be flagged, staked, or fenced and designated as an Environmentally Sensitive Area. No activity will occur within this area if feasible. If encroachment within this area is required, USFWS will be consulted and

CDFW coordinated with to determine appropriate compensation measures for the loss of giant garter snake habitat, as appropriate.

d) USFWS-approved worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented. Construction activities will be minimized within 200 feet of the banks of giant garter snake habitat if feasible. Movement of heavy equipment will be confined to existing roadways to minimize habitat disturbance. If disturbance of potential giant garter snake habitat cannot be avoided, USFWS will be consulted and CDFW coordinated with to determine appropriate compensation measures for the loss of giant garter snake habitat, as appropriate.

e) Vegetation shall be hand-cleared in areas where giant garter snakes are suspected to occur. Exclusionary fencing with one-way exit funnels shall be installed at least 1 month before activities to allow the species to passively leave the area and to prevent reentry into work zones, per USFWS and/or CDFW guidance.

f) If a giant garter snake is found during construction activities, USFWS, CDFW, and the project's biological monitor will immediately be notified. The biological monitor, or his/her assignee, will stop construction in the vicinity of the find and allow the snake to leave on its own. The monitor will remain in the area for the remainder of the work day to ensure the snake is not harmed. Escape routes for giant garter snake will be considered in advance of construction and snakes will be allowed to leave on their own. If a giant garter snake does not leave on its own within 1 working day, USFWS and CDFW will be consulted prior to resuming construction activity.

g) All construction-related holes will be covered to prevent entrapment of individuals. Where applicable, construction areas will be dewatered 2 weeks before the start of activities to allow giant garter snakes and their prey to move out of the area before any disturbance.

Mitigation Measure BIO-13: Compensate for Temporary or Permanent Loss of Giant Garter Snake Habitat.

a) Temporarily affected giant garter snake aquatic habitat will be restored in accordance with criteria listed in the USFWS *Mitigation Criteria for Restoration and/or Replacement of Giant Garter Snake Habitat* (Appendix A to *Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake Within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California* (USFWS 1997)), or the most current criteria from USFWS or CDFW.

b) Permanent loss of giant garter snake habitat will be compensated at a ratio and in a manner consulted on with USFWS and CDFW. Compensation may include preservation and enhancement of existing populations, restoration or creation of suitable habitat, or purchase of credits at an approved mitigation bank in sufficient quantity to compensate for the effect. Credit purchases, land preservation, or land enhancement to minimize effects to giant garter snakes should occur geographically close to the impact area. If off-site compensation is chosen, it may include dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, and the details of these measures as applicable will be included in the mitigation plan.

Western Pond Turtle

Western pond turtles are known to occur within the project area, and their suitable habitat includes annual grassland and wetlands. The proposed project could directly impact this species if any animals are present within these areas. Therefore, this impact would be potentially significant.

However, with implementation of mitigation measure BIO-14 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measure WPT-1), impacts to western pond turtle would be avoided or minimized by requiring that an agency approved biologist conduct a survey of aquatic habitats to relocate any individuals, if present, prior to removal or placement of structures, crossings, or weirs.

Mitigation Measure BIO-14: Avoid and Minimize Loss of Western Pond Turtle Individuals.

a) A biologist approved by CDFW will conduct surveys in aquatic habitats to be dewatered and/or filled during project construction. Surveys will be conducted immediately after dewatering and before fill of aquatic habitat suitable for western pond turtles. If western pond turtles are found, the biologist will capture them and move them to nearby CDFW-approved areas of suitable habitat that will not be disturbed by project construction.

Swainson's Hawk

Project actions could directly impact this species if any are nesting within 0.5 mile of the construction activities by disturbing nesting behavior as a result of construction noise and traffic (causing adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure). The nesting season extends from February 15 through September 15 (SHTAC 2000). Although no nest trees are anticipated to be removed within the construction footprint, construction activities could disturb hawks nesting nearby. Construction activities could also temporarily disturb foraging habitat (e.g., annual and perennial grasslands, cropland) for this species. Therefore, this impact would be potentially significant.

However, implementation of mitigation measure BIO-15 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measure SWH-1) would avoid and minimize impacts to Swainson's hawk by conducting preconstruction surveys for active nests within 0.5 mile of the project areas and establishing a 0.5-mile no-disturbance buffer around the active nest if construction cannot be limited to occur outside the nesting season, if feasible. CDFW will be consulted by DWR to determine appropriate measures for this species, as appropriate.

Mitigation Measure BIO-15: Avoid and Minimize Impacts to Swainson's Hawk.

a) Preconstruction surveys for active Swainson's hawk nests will be conducted in and around all potential nest trees within 0.5 mile of project-related disturbance (including construction-related traffic). These surveys would follow the methodology developed by the Swainson's Hawk Technical Advisory Committee (SHTAC 2000).

b) If known or active nests are identified through preconstruction surveys or other means, a 0.5-mile no-disturbance buffer shall be established, if feasible, around all active nest sites if construction cannot be limited to occur outside the nesting season (February 15 through September 15). The no-disturbance buffer will be maintained around active nests until the breeding season has ended or until a CDFW-approved biologist has determined that the birds

have fledged and are no longer reliant upon the nest or parental care for survival. If encroachment into the buffer area is required, CDFW will be coordinated with to determine appropriate compensation measures for impacts to Swainson's hawk.

c) Worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented.

Loggerhead Shrike and Raptors, including Northern Harrier, White-Tailed Kite

Project actions could directly impact raptors if any are nesting within or adjacent to the construction footprint by disturbing nesting behavior as a result of construction noise and traffic (causing adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure) or if nest trees/areasare anticipated to be disturbed within the construction footprint. The nesting season extends from February 15 to September 15 (SHTAC 2000). Therefore, this impact would be potentially significant.

However, implementation of mitigation measures BIO-16 and BIO-17 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures RAPTOR-1 and -2, respectively) would avoid and minimize impacts to raptors by conducting preconstruction surveys prior to commencement of construction activities, establishing a no-disturbance buffer if any active raptor nests are observed within the project footprint through coordination with CDFW, and conducting biological monitoring until the biologist determines the nest is no longer active or would compensate for impacts by replacing an appropriate number of trees in coordination with the CDFW for any native trees removed during project activities.

Mitigation Measure BIO-16. Avoid and Minimize Loss of Individual Raptors.

a) Vegetation removal will only occur outside the typical breeding season for raptors (September 16 to February 14), if feasible.

b) Preconstruction surveys by a USFWS- and CDFW-approved biologist will be conducted in areas of suitable habitat to identify active nests in the project footprint.

c) If active nests are located in or adjacent to the project footprint, a no-disturbance buffer will be established if feasible until a USFWS- and CDFW-approved biologist determines that the nest is no longer active. The size of the buffer will be established by the approved biologist in coordination with USFWS and/or CDFW based on the sensitivity of the resource, the type of disturbance activity, and nesting stage. No activity shall occur within the buffer area, and worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented. If encroachment into the buffer is required, USFWS and/or CDFW will be coordinated with to determine appropriate compensation measures to avoid and minimize loss of individual raptors.

Mitigation Measure BIO-17: Compensate for Loss of Raptor Nest Trees.

b) Native trees removed during project activities will be replaced with an appropriate number of native trees, in coordination with CDFW and USFWS, as appropriate.

Nesting and/or Overwintering Migratory Birds

The Central Valley wetlands support approximately 60% of the Pacific Flyway's and 20% of the United States' waterfowl population. Merced NWR is one of the most significant waterfowl refuges in the Central Valley. Project actions could directly impact migratory birds, including tricolored blackbird, least Bell's vireo, and yellow-headed blackbird, if any are nesting or overwintering within the construction area. Nesting and/or overwintering behavior could be disrupted from construction noise and traffic (causing disruption of foraging behavior, adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure) or if vegetation used for nests is anticipated to be removed within the construction footprint. The nesting season extends from February 15 to September 15 (SHTAC 2000). Therefore, this impact would be potentially significant.

The removal of the two weirs in the Eastside Bypass operated by USFWS within the Merced NWR would change the inundation patterns within the bypass at lower flows. Under existing conditions, depressions within the Bypass and Refuge can inundate at depths of about 1 foot, providing potential wetland habitat for migratory birds. Depending on water availability, some areas of wetland habitat either may no longer be inundated at flows of about 100 cfs from September through March or may become inundated at less frequent intervals. Over the last 2 years, no installation of the weir boards has occurred due to drought, flood, and the presence of Restoration Flows. This limitation would persist as the presence of Restoration Flows would limit operation of the weirs such that boards could not be installed. Additional water in the bypass from Restoration Flows would generally provide the opportunity for additional inundation during drier year types, especially during fall pulse flows when it is highly likely that the Merced NWR does not have water to inundate much of these areas. However, this effect to these seasonally inundated depressions varies widely. During flood conditions, there is water from levee toe to levee toe, inundating the entire Eastside Bypass. Prior to Restoration Flows, the backwater from the weirs would inundate these depressions that support wetland habitat. However, during the last year, without installation of the boards, less inundated wetland habitat occured behind the weir structures. With the project, the weirs would be removed to improve fish passage in the bypass, thus, changing the channel from a slower flow to a less-obstructed flow, allowing deeper water in the center of the channel draining (an estimated 5 acres of "wet herbaceous" would change to "riverine/open water"), while the edge habitats would be expected to remain. During certain flows rates, the wetland habitat depressions would continue to be inundated. Although for migratory birds, the frequency and function of the wetlands would change somewhat, consistent water in the Eastside Bypass would lead to a connected riparian corridor with potential migratory bird benefits.

With implementation of mitigation measure BIO-18 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measure MBTA-1), impacts to migratory birds would be avoided or minimized to a less-than-significant level by not constructing during the nesting season if species covered under the MBTA and Fish and Game Code Sections 3503, 3503.5, and 3513 are determined to be actively nesting.

Mitigation Measure BIO-18: Avoid and Minimize Effects to Migratory Bird Species.

a) Vegetation removal will only occur March 1 to August 31 within the Merced NWR to avoid the overwintering season for migratory bird species, if feasible. In all other areas, vegetation removal will only occur September 1 to February14 to avoid the typical breeding season for migratory bird species, if feasible.

b) If species covered under the Migratory Bird Treaty Act and Fish and Game Code Sections 3503, 3503.5, and 3513 are determined to be present on the Merced NWR and if project

activity will occur on the Merced NWR during the typical overwintering season, the Merced NWR will be coordinated with to determine appropriate measures to avoid and minimize effects to migratory bird species. In all other areas, USFWS and/or CDFW will be coordinated with to determine appropriate measures to avoid and minimize effects to migratory bird species. Measures may include establishing a no-disturbance buffer around any active migratory bird nests that are observed within or adjacent to the project footprint, and conducting biological monitoring until the biologist determines the nest is no longer active.

c) An Avian Protection Plan will be developed in coordination with USFWS and CDFW and implemented by the lead agencies, as appropriate.

d) The Merced NWR will be coordinated with to minimize potentially adverse impacts to wetland habitat attributed to the removal of the two weirs.

Burrowing Owl

Project actions could directly impact occupied burrowing owl burrows if any occur in the vicinity of the construction area by disturbing nesting behavior as a result of construction noise and traffic (causing adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure) or removing burrows. Therefore, this impact would be potentially significant.

However, with implementation of mitigation measures BIO-19 and BIO-20 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures BRO-1 and -2, respectively), impacts to burrowing owl would be avoided or minimized by conducting preconstruction surveys within 30 days prior to commencement of construction activities, establishing buffers around occupied burrows, as required by the Staff Report on Burrowing Owl Mitigation (CDFG 2012), and preparing a plan in coordination with CDFW that includes mitigation measures to offset burrow and foraging habitat if impacts occur to these areas.

Mitigation Measure BIO-19: Avoid Loss of Burrowing Owl.

a) Preconstruction surveys by a CDFW-approved biologist for burrowing owls will be conducted in areas supporting potentially suitable habitat and within 30 days before the start of construction activities. If ground-disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site will be resurveyed.

b) Occupied burrows will not be disturbed during the breeding season (February 1 through August 31), if feasible. If feasible, a minimum 160-foot-wide buffer will be placed around occupied burrows during the nonbreeding season (September 1 through January 31), and a minimum 650-foot-wide buffer will be placed around occupied burrows during the breeding season. Ground-disturbing activities will not occur within the designated buffers, if feasible. If loss of burrowing owl cannot be avoided, CDFW will be consulted to determine appropriate compensation measures for the loss of burrowing owl, as appropriate.

Mitigation Measure BIO-20: Minimize Impacts to Burrowing Owl.

a) If a CDFW-approved biologist can verify through noninvasive methods that owls have not begun egg-laying and incubation, or that juveniles from occupied burrows are foraging independently and are capable of independent survival, a plan shall be coordinated with

CDFW to offset burrow habitat and foraging areas on the project site if burrows and foraging areas are taken by the proposed project.

b) If destruction of occupied burrows occurs, existing unsuitable burrows will be enhanced (enlarged or cleared of debris) or new burrows created. This will be done in consultation with CDFW.

c) Passive owl relocation techniques will be implemented. Owls will be excluded from burrows in the immediate impact zone within a 160-foot-wide buffer zone by installing one-way doors in burrow entrances. These doors will be in place at least 48 hours before excavation to insure the owls have departed.

d) The project area will be monitored daily for 1 week to confirm owl departure from burrows before any ground-disturbing activities.

e) Where possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

Fresno Kangaroo Rat

Project actions could directly impact occupied Fresno kangaroo rat if any occur in the vicinity of the construction area where annual and perennial grasslands occur. Therefore, this impact would be potentially significant.

However, with implementation of mitigation measure BIO-21 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measure FKR-1), impacts to this species will be avoided by conducting preconstruction surveys 30 days prior to commencement of construction activities to determine whether suitable burrows occur within the footprint, in coordination with USFWS and CDFW, and conducting construction activities in potentially suitable habitat outside of the breeding season, which extends from December through September, if feasible.

Mitigation Measure BIO-21: Avoid and Minimize Effects to Fresno Kangaroo Rat.

a) Preconstruction surveys will be conducted by a USFWS- and CDFW-approved biologist per USFWS and CDFW survey methodology to determine if potential burrows for Fresno kangaroo rat are present in the project footprint. Surveys will be conducted within 30 days before ground-disturbing activities. The approved biologist will conduct burrow searches by systematically walking transects, which will be adjusted based on vegetation height and topography, and in coordination with USFWS and CDFW. Transects shall be used to identify the presence of kangaroo rat burrows. When burrows are found within 100 feet of the proposed project footprint, focused live trapping surveys shall be conducted by the approved and permitted biologist, following a methodology approved in advance by USFWS and CDFW. Additional conservation measures may be developed pending the results of surveys, and in consultation with USFWS and CDFW.

San Joaquin Kit Fox

Project actions could directly impact San Joaquin kit fox if any dens occur in the vicinity of the construction area by disturbing kit fox behavior as a result of construction noise and traffic (causing

adult abandonment of the den and/or reproductive failure) or removing dens and foraging habitat. Therefore, this impact would be potentially significant.

However, mitigation measures BIO-22 and BIO-23, which are consistent with the SJRRP Conservation Strategy Conseration Measures SJKF-1 and -2 and *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011), will be implemented to avoid and minimize potential impacts to SJKF associated with the construction, operation, and maintenance activities for Project:

Mitigation Measure BIO-22: Conduct Pre-construction Surveys for San Joaquin Kit Fox and Employee Education Program.

a) A USFWS-approved biologist will conduct pre-construction surveys no fewer than 14 days and no more than 30 days prior to the onset of any ground disturbing activity. The primary objective is to identify kit fox habitat features (e.g. potential dens and refugia) on the project site. If San Joaquin kit fox are detected at any time, all activities associated with the project will be halted immediately. The project will be placed on hold until consultation with the USFWS and CDFW is completed.

b) DWR and/or Reclamation will conduct an employee education program prior to the start of construction. The lead agency will retain a USFWS-approved biologist to conduct one brief presentation on the San Joaquin kit fox to train all construction staff that will be involved with the project. This training will include:

- A description of the San Joaquin kit fox and its habitat needs.
- Information on San Joaquin kit fox occurrence within the project vicinity.
- An explanation of the status of the species and its protection under the Endangered Species Act.
- A list of the measures being taken to reduce impacts to the species during construction.
- A “fact sheet” conveying all training information prepared and distributed to all construction personnel in attendance at the initial training and to be used by construction manager to train any additional construction staff not in attendance at the first meeting, prior to starting work on the project.
- Reclamation and/or DWR will provide a summary of the training provided, including a list of personnel attending to USFWS within 7 days of the training.

Mitigation Measure BIO-23: Conduct Construction Activities to Minimize Construction Impacts to San Joaquin Kit Fox.

a) Construction activities will be carried out in a manner that minimizes adverse effects to San Joaquin kit foxes, should they occur in the project area. Minimization measures will include:

- Project-related vehicles will observe a daytime speed limit of 15 mph throughout the site in all project areas, except on State and Federal highways. Night-time work, such as

equipment maintenance, will be minimized to the extent possible. However, if work does occur after dark, the speed limit will be reduced to 10 mph.

- Off-road project-related construction traffic outside of designated the project area will be prohibited.

- Construction work at night (half hour after sunset to half-hour before sunrise) will not be allowed.

- To prevent inadvertent entrapment of San Joaquin kit fox or other animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered with plywood or similar materials at the end of each workday. If the trenches cannot be closed, one or more escape ramps constructed of earthen fill or wooden planks will be installed. Before such holes or trenches are filled, they will be inspected for trapped animals.

- All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for San Joaquin kit fox before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until USFWS has been consulted and CDFW contacted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

- Before the start of work each day, the work site will be checked for animals under any equipment to be used that day, such as vehicles or stockpiles of items such as pipes. If a San Joaquin kit fox is found, it will be allowed to leave on its own volition. Work will be halted, and Reclamation and/or DWR contacted. Reclamation will notify USFWS and CDFW within 48 hours.

- All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in securely closed containers and removed at least once a day from a construction or project site.

- No firearms will be permitted on the project site.

- No pets will be permitted on the project site.

- Use of rodenticide in the project area will not be allowed.

- Upon completion of the project, all areas subject to temporary ground disturbances, including staging areas, temporary roads, and borrow sites, will be re-contoured if necessary and revegetated with native seed to promote restoration of the area to pre-project conditions.

- Sightings of San Joaquin kit fox will be reported to the California Natural Diversity Data Base.

- The contractor will be required to keep their equipment in good working condition to prevent leaks and spills of petroleum products or other fluids into waters of the U.S.

- All equipment will be washed prior to arriving at the project site to remove soil and seeds and to prevent spread of noxious weeds.

Western Mastiff Bat

Project actions associated with removal of the low flow crossing, installation of the fish passage at the Eastside Bypass Control structure, or removal of trees could directly impact roosting bats if present. Therefore, this impact would be potentially significant.

However, implementation of mitigation measures BIO-24 and BIO-25 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures BAT-1 and -2, respectively) would ensure that impacts to this species are avoided or minimized by conducting surveys prior to commencement of construction activities or by excluding the bats from roost sites if avoidance is infeasible or would be compensated for by replacing roosting habitat in consultation with CDFW.

Mitigation Measure BIO-24: Avoid and Minimize Loss of Bat Species.

a) If suitable roosting habitat for special-status bats will be affected by project construction (e.g., removal of buildings, modification of bridges), surveys for roosting bats on the project site will be conducted by a qualified biologist. The type of survey will depend on the condition of the potential roosting habitat and may include visual surveys or use of acoustic detectors. Visual surveys may consist of a daytime pedestrian survey for evidence of bat use (e.g., guano) and/or an evening emergence survey for the presence or absence of bats. The type of survey will depend on the condition of the potential roosting habitat. If no bat roosts are found, then no further study is required.

b) If evidence of bat use is observed, the number and species of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts.

c) If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the facility is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures will be developed in consultation with CDFW before implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave, but not reenter), or sealing roost entrances when a site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young).

Mitigation Measure BIO-25: Compensate for Loss of Bat Habitat.

a) The loss of each roost will be replaced, in consultation with CDFW, and may include construction and installation of bat boxes suitable to the bat species and colony size excluded from the original roosting site. Roost replacement will be implemented before bats are excluded from the original roost sites. Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost sites, the structure may be removed.

Substantially Alter Designated Critical Habitat

Project actions associated with the construction footprint within the Eastside Bypass Control Structure could modify the physical and biological features needed for the species life history within critical habitat for Hoover's spurge (critical habitat Unit 6B), Conservancy fairy shrimp (critical habitat Unit 7C), vernal pool fairy shrimp (critical habitat Unit 23C), and vernal pool tadpole shrimp (critical habitat Unit 16C) (see **Figure 3.5-2**). These physical and biological features include annual and perennial grasslands within the associated vernal pool watershed. Therefore, this impact would be potentially significant.

However, implementation of mitigation measures BIO-26 and BIO-27 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures CH-1 and -2, respectively) would ensure that impacts to critical habitat would be avoided or minimized by avoiding the physical and biological features needed for the species life history, or establishing and maintaining buffers around areas of designated critical habitat, if feasible, or would be compensated for by offsite dedication of conservation easements, purchase of mitigation credits, or other offsite conservation measures through Section 7 consultation with USFWS.

Mitigation Measure BIO-26: Avoid and Minimize Effects to Critical Habitat.

a) All proposed project actions will be designed to avoid direct and indirect adverse modifications to designated critical habitat, if feasible.

b) If critical habitat cannot be avoided, minimization measures, such as establishing and maintaining buffers around areas of designated critical habitat or primary constituent elements, shall be implemented if feasible. If not feasible, USFWS will be consulted to determine appropriate compensation measures to avoid and minimize effects to critical habitat, as appropriate.

Mitigation Measure BIO-27: Compensate for Unavoidable Adverse Effects on Federally Designated Critical Habitat.

a) If critical habitat may be adversely modified by the implementation of the proposed project actions, the area to be modified will be evaluated by a USFWS-approved biologist to determine the potential magnitude of the project effects (i.e., description of primary constituent elements present and quantification of those affected) at a level of detail necessary to satisfy applicable environmental compliance and permitting requirements.

b) Compensatory conservation measures developed through Section 7 consultation with USFWS will be implemented. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in and developed as part of the USFWS consultation process. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.

The impact on critical habitat would be less than significant after mitigation. The impacts on critical habitat identified above would be a less-than-significant impact with mitigation incorporated because

critical habitat would be avoided, minimized, or compensated for, and the proposed mitigation measures are based on SJRRP Conservation Measures developed and approved by USFWS and CDFW.

The overall impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS would be less than significant after mitigation because these impacts would be avoided, minimized, or compensated for, and the proposed mitigation measures are based on SJRRP Conservation Measures developed and approved by USFWS and CDFW.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service? *(Less-than-Significant Impact with Mitigation Incorporated)*

Substantially Alter Riparian Habitat and Other Sensitive Communities

An aquatic resources delineation was recently completed (Reclamation 2017c). This delineation of waters of the United States will be submitted to USACE for verification. This delineation was conducted according to methods established in the USACE *Wetlands Delineation Manual* (USACE, Environmental Laboratory 1987) and *Arid West Supplement* (USACE, Environmental Laboratory 2008). Although no riparian habitat is expected to be directly removed as a result of the proposed project, the proposed project could temporarily and/or permanently affect other sensitive natural communities, including wetlands, during construction (see **Table 3.5-1**). Project actions that may result in direct adverse impacts to sensitive communities, including vegetation clearing and direct and indirect effects to wetlands. Project actions also would result in indirect effects on riparian and sensitive natural communities through the alteration of the timing, depth, or duration of inundation which could impact sensitive communities that rely on specific inundation regimes.

The removal of the two weirs in the Eastside Bypass operated by USFWS within the Merced NWR would change the inundation patterns within the bypass at lower flows. Under existing conditions, depressions within the Bypass and Refuge can inundate at depths of about 1 foot, supporting wetland habitats, such as freshwater emergent wetland, riparian, and wet herbaceous land cover types. Depending on water availability, some areas of wetland habitat either may no longer be inundated at flows of about 100 cfs from September through March or may become inundated at less frequent intervals. Over the last year, no installation of the weir boards has occurred due to flood conditions and the presence of Restoration Flows. Additional water in the bypass from Restoration Flows would generally provide the opportunity for additional inundation during drier year types, especially during fall pulse flows when it is highly likely that the Merced NWR does not have water to inundate much of these areas. The weir removal would change the channel from a slower flow to a less-obstructed flow, allowing deeper water in the center of the channel to drain, and likely converting an estimated 5 acres of "wet herbaceous" to "riverine/open water."

Although, the frequency and function of inundated habitat would change somewhat, consistent water in the Eastside Bypass would lead to a connected riparian corridor. However, this impact could be potentially significant because of the changed inundation pattern. Implementing mitigation measures BIO-28, BIO-29, BIO-6, BIO-7, and BIO-8 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures RHSNC-1, RHSNC-2, VP-1, VP-2, and VP-3, respectively) would ensure that other sensitive communities are avoided or compensated for at no net loss.

Mitigation Measure BIO-28: Avoid and Minimize Loss of Riparian Habitat and Other Sensitive Natural Communities.

a) Construction activities will be avoided in areas containing sensitive natural communities, as appropriate.

b) If effects occur to riparian habitat, managed and unmanaged wetlands (e.g., freshwater emergent marsh, seasonal wetlands, vernal pools, etc.), or other sensitive natural communities associated with streams, the State lead agency will comply with Section 1602 of the California Fish and Game Code; compliance may include measures to protect fish and wildlife resources during the project.

Mitigation Measure BIO-29: Compensate for Loss of Riparian Habitat and other Sensitive Natural Communities.

a) The Riparian Habitat Mitigation and Monitoring Plan for the SJRRP will be developed and implemented in coordination with CDFW and USFWS. The benefit of increased acreage or improved ecological function or riparian and wetland habitats resulting from the implementation of the SJRRP will be considered before additional compensatory measures are proposed.

b) If losses of other sensitive natural communities (e.g., recognized as sensitive by CNDDB, but not protected under other regulations or policies) would not be offset by the benefits of the SJRRP, then additional compensation will be provided through creating, restoring, or preserving communities at a sufficient ratio for no net loss of habitat function or acreage. The appropriate ratio will be determined in coordination with USFWS or CDFW.

Mitigation Measure BIO-6: Avoid Effects to Vernal Pool Species.

Please refer to Mitigation Measure BIO-6 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

Mitigation Measure BIO-7: Minimize Effects to Vernal Pool Species.

Please refer to Mitigation Measure BIO-7 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

Mitigation Measure BIO-8: Compensate for Temporary or Permanent Loss of Habitat.

Please refer to Mitigation Measure BIO-8 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

The impacts on riparian and sensitive natural communities would be a less-than-significant impact with mitigation incorporated because sensitive communities are avoided or compensated for at no net loss.

Facilitate an Increase in Distribution and Abundance of Invasive Plants

The proposed project could facilitate an increase in the disturbance and abundance of invasive plants by directly transporting invasive seed sources on site (and between sites) via equipment and by creating

ideal seed beds through ground disturbance and resulting bare soils. Therefore, this impact would be potentially significant.

However, implementing mitigation measure BIO-30 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measure INV-1), which includes the implementation of an invasive plant prevention, monitoring, and management plan to control or eradicate invasive plant infestations and to control weed species within sensitive communities, would ensure that impacts associated with invasive species are controlled or eradicated.

Mitigation Measure BIO-30: Implement the Invasive Vegetation Monitoring and Management Plan.

a) The Invasive Vegetation Monitoring and Management Plan for the SJRRP (Appendix L of the SJRRP Draft PEIS/R) will be implemented, which includes measures to prevent, monitor, control, and where possible eradicate invasive plant infestations during flow releases and construction activities.

b) The implementation of the Invasive Vegetation Monitoring and Management Plan (Appendix L of the SJRRP Draft PEIS/R) will include monitoring procedures, thresholds for management responses, success criteria, and adaptive management measures for controlling invasive plant species.

c) The control of invasive weeds and other recommended actions in the Invasive Vegetation Monitoring and Management Plan (Appendix L of the SJRRP Draft PEIS/R) will be consistent with recommendations in the Fish and Wildlife Coordination Act Report for the SJRRP (Appendix F of the SJRRP Draft PEIS/R).

The impact of invasive species would be a less-than-significant impact with mitigation incorporated.

Overall, the impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS would be less than significant after mitigation. Potential impacts would be avoided, minimized, or compensated for, and the proposed mitigation measures are based on SJRRP Conservation Measures developed and approved by USFWS and CDFW.

c) Have a substantial adverse effect on Federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
(Less-than-Significant with Mitigation Incorporated)

Project construction actions could temporarily or permanently impact waters of the United States (see **Table 3.5-1**). An aquatic resources delineation was recently completed (Reclamation 2017c). This delineation of waters of the United States will be submitted to USACE for verification. This delineation was conducted according to methods established in the USACE *Wetlands Delineation Manual* (USACE, Environmental Laboratory 1987) and *Arid West Supplement* (USACE, Environmental Laboratory 2008). Project actions that may result in temporary and permanent impacts to waters of the United States include instream vegetation clearing, fill of waterways, stabilization actions associated with the Eastside Bypass levee, construction equipment, staging areas, and access routes. Therefore, this impact would be

potentially significant. However, implementation of Mitigation Measures BIO-31, BIO-32, BIO-6, BIO-7, and BIO-8 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures WUS-1, WUS-2, VP-1, VP-2, and VP-3, respectively) would ensure that all wetlands and waters of the United States are mapped and quantified within potential construction areas and that all waters found within 250 feet of impacts areas would be avoided, as feasible. If infeasible, implementation of Conservation Measures WUS-2 and VP-3 would ensure that any loss of wetlands, vernal pools, or other waters of the United States are compensated on a no net loss basis.

Mitigation Measure BIO-31: Identify and Quantify Wetlands and other Waters of the United States.

a) A delineation of waters of the United States will be conducted and the delineation submitted to USACE for verification. The delineation will be conducted according to methods established in the USACE *Wetlands Delineation Manual* (USACE, Environmental Laboratory 1987) and *Arid West Supplement* (USACE, Environmental Laboratory 2008).

b) Construction and modification of road crossings, control structures, fish barriers, fish passages, and other structures will be designed to minimize effects on waters of the United States and waters of the State, and will employ BMPs to avoid indirect effects on water quality.

Mitigation Measure BIO-32: Obtain Permit and Compensate for any Loss of Wetlands and other Waters of the United States/Waters of the State.

a) In coordination with USACE, the acreage of effects on waters of the United States and waters of the State will be determined for the proposed project.

b) The proposed project will adhere to a "no net loss" basis for the acreage of wetlands and other waters of the United States and waters of the State that will be removed and/or degraded. Wetland habitat will be restored, enhanced, and/or replaced at acreages, types, and locations and by methods agreed on by USACE, USFWS, and the Central Valley RWQCB, as appropriate, depending on agency jurisdiction.

c) Section 404 and Section 401 permits will be obtained and all permit terms complied with. The acreage, location, and methods for compensation will be determined during the Section 401 and Section 404 permitting processes.

d) The compensation will be consistent with recommendations in the Fish and Wildlife Coordination Act Report for the SJRRP (Appendix F of the SJRRP Draft PEIS/R).

Mitigation Measure BIO-6: Avoid Effects to Vernal Pool Species.

Please refer to Mitigation Measure BIO-6 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

Mitigation Measure BIO-7: Minimize Effects to Vernal Pool Species.

Please refer to Mitigation Measure BIO-7 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

Mitigation Measure BIO-8: Compensate for Temporary or Permanent Loss of Habitat.

Please refer to Mitigation Measure BIO-8 in "Substantially Affect Special-status Plant Species" above for the full text of this mitigation measure.

The impact to waters of the United States/waters of the State would be a less-than-significant impact with mitigation incorporated because these habitats would be avoided or compensated for at no net loss.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? *(Less-than-Significant Impact)*

The proposed project would result in localized and small disturbance that would not affect native wildlife nursery sites, or substantially interfere with the movement of native resident or migratory wildlife species. Therefore, this impact would be less than significant.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? *(Less-than-Significant Impact with Mitigation Incorporated)*

Merced County General Plan Policy NR-1.5 (Wetland and Riparian Habitat Buffer), Policy NR-1.12 (Wetland Avoidance), and Policy NR-1.13 (Wetland Setbacks) require that wetlands and riparian habitat areas are identified and a designated buffer zone is established to protect from degradation, encroachment, or loss. The Merced NWR maintains its own related policies and ordinances (see "Regulatory Setting" in Section 3, "Land Use and Planning"). Project actions associated with instream work could impact wetlands and other waters of the United States and riparian habitat. Therefore, this impact would be potentially significant.

However, implementation of mitigation measures BIO-28, BIO-29, BIO-31, and BIO-32 (adapted from and identified in the SJRRP Draft PEIS/R as Conservation Measures WUS-1 and -2, and RHSNC-1 and -2, respectively) would ensure that waters of the United States and riparian habitat would be avoided or compensated for to ensure a no net loss of waterways.

Mitigation Measure BIO-28: Avoid and Minimize Loss of Riparian Habitat and Other Sensitive Natural Communities.

Please refer to Mitigation Measure BIO-31 in "Substantially Alter Riparian Habitat and Other Sensitive Communities" above for the full text of this mitigation measure.

Mitigation Measure BIO-29: Compensate for Loss of Riparian Habitat and other Sensitive Natural Communities.

Please refer to Mitigation Measure BIO-31 in "Substantially Alter Riparian Habitat and Other Sensitive Communities" above for the full text of this mitigation measure.

Mitigation Measure BIO-31: Identify and Quantify Wetlands and other Waters of the United States.

Please refer to Mitigation Measure BIO-33 in "Fill, Fragment, Isolate, Divert, or Substantially Alter Jurisdictional Waters of the United States (including, but not limited to, marsh, vernal pool, coastal)" above for the full text of this mitigation measure.

Mitigation Measure BIO-32: Obtain Permit and Compensate for any Loss of Wetlands and other Waters of the United States/Waters of the State.

Please refer to Mitigation Measure BIO-34 in "Fill, Fragment, Isolate, Divert, or Substantially Alter Jurisdictional Waters of the United States (including, but not limited to, marsh, vernal pool, coastal)" above for the full text of this mitigation measure.

The conflict with local policies or ordinances protecting biological resources or local tree ordinances would be a less-than-significant impact with mitigation incorporated.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, state, or federal habitat conservation plan?
(No Impact)

The proposed project was designed to minimize any permanent adverse effects on riparian habitat and wetlands, and includes mitigation measures to reduce temporary and permanent effects on these habitats and associated special-status species to less-than-significant levels. In addition, the proposed project would improve aquatic habitat and enhance fish passage in the project area. The proposed project would not conflict with any provisions in the draft acts, plans, and policies described in Section 3.5.2, "Regulatory Setting." Therefore, the proposed project would have no impact.

3.6 Cultural Resources

Environmental Issue (CEQA-only)	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Beneficial Impact
VI. CULTURAL RESOURCES – Would the project:					
a) Cause a substantial adverse change in the significance of a historical resources as defined in section 15064.5?	☐	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (See Section 3.15, "Paleontological Resources," for response)					
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐	☐
e) Cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC section 5020.1(k), or	☐	☐	☒	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐	☐

3.6.1 Environmental Setting

This section describes existing conditions for cultural resources, Tribal Cultural Resources (TCRs), and Indian Sacred Sites within the project area. All information regarding existing conditions was collected through an examination of current literature, archival and record search information, and archaeological

inventory survey data related to the project area. Information regarding archaeological and ethnographic context is contained in a confidential cultural resources inventory report submitted to Reclamation in 2017 (Holm et. al. 2017). Paleontological resources are addressed in Section 3.15, "Paleontological Resources." Indian Trust Assets are addressed in Section 3.21, "Indian Trust Assets."

For information regarding Reclamation's and DWR's Native American and Tribal consultations pursuant to Federal and State regulatory requirements, respectively, including DWR's Assembly Bill (AB) 52 Tribal consultation compliance, see Section 5.1.3, "Native American Consultation."

Archaeological Context

The project area is located in the Central Valley Region of California, which is bound by the Siskiyou Mountains to the north, the Tehachapi Mountains to the south, the Coast Ranges to the west, and the Sierra Nevada and Cascade ranges to the east. The archaeological record within the Central Valley Region encompasses the full range of hunter-gatherer adaptation. Rosenthal et al. (2007) have noted that prehistoric peoples within the Central Valley Region developed a sophisticated material culture, became the nexus for an extensive trade system incorporating distant and neighboring regions, and reached population densities equaled only by agricultural societies in the American Southwest and Southeast.

No single cultural historical framework has been established that accommodates the entire prehistoric record of the Central Valley Region. In discussing the cultural history of the Central Valley Region and, more specifically, the project area, it is therefore appropriate to use the broad period and stage classification system developed by Fredrickson (1973, 1974) and refined by Rosenthal et al. (2007:150) while referencing more localized cultural historical sequences put forth by Olsen and Payen (1969) and Moratto (1984). Broad periods identified for the Central Valley Region include the Paleo-Indian (11,550-8,550 BC), Lower Archaic (8,550-5,550 BC), Middle Archaic (5,550-550 BC), Upper Archaic (550 BC-1100 AD), and Emergent (1000 AD-Historic) periods. A more localized sequence relevant to the project area is defined largely by distinctive artifact types and mortuary practices, and includes the Positas (ca. 3,300-2,600 BC), Pacheco (2,600 BC-AD 300), Gonzaga (AD 300-1000), and Panoche (AD 1500-1850) complexes.

Prehistoric Context

This summary of the Prehistoric Context is adapted from Holm et al. 2017.

There is little evidence for Paleo-Indian (during the termional Pleistocene) habitation in the San Joaquin Valley, most evidence being in the form of isolated fluted project points. Paleo-Indian groups are thought to have been small, highly mobile, and economically focused targeting large fauna.

Ealy Holocene sites are more numerous throughout California, but in the San Joaquin Valley there is only one site, CA-KER-116, that has been reliably identified to this period. The site assemblage yielded flaked stone crescents, an atlatl spur, and various flaked stone tools. The presence of large, finely worked projectile points has led some researchers to conclude that hunting of large artiodactyls was an important component of the diet.

During the Middle Holocene, climate changes led to the disappearance or reduction of many pluvial lakes, the stabilization of several alluvial fans and flood plains, and the formation of the extensive wetland habitat of the Sacramento-San Joaquin River Delta. Groups adapted to the the changing climate by developing complex socio-economic strategies focused on riverine and marsh resoruces and a more

elaborate material culture, examples of which include the Positas Complex and the Pacheco Complex (which extended intot the Late Holocene).

Late Holocene environmental changes were characterizec by cooler, wetter, and more stable climatic conditions. Complexes associated with the Late Holocene include the Gongaza and Panoche complexes. Very generally, Late Hoocene assemblages were substantial and regionally specific. The bow and arrow was introduced and mortuary practices became more complex. Large settlements were established along rivers for seasonal salmon runs and villages and other, smaller communities continued to be established along streams in the foothills and river channels and slough on the valley floor.

Ethnographic Context

The project area falls within the traditional territory of the Northern Valley Yokuts (Kroeber 1925; Wallace 1978). The Yokuts were hunter-gatherers who divided themselves into tribelets organized by kin and shared dialects, resulting in a mosaic of smaller territories and discrete settlements (Kroeber 1925:474). Yokuts' populations numbered approximately 41,000 at contact and primarily clustered at a narrow strip of land bordering the San Joaquin River and its tributaries, as well as lands east of the river along the Sierra Nevada foothills.

Historic Context

As ranching and agriculture developed along the San Joaquin River, irrigation and levee systems became important tools for managing water resources and controlling flooding. As part of this process, large tracts of tule swamp were drained to create ranching and agricultural lands. The earliest irrigation system developed within the project area was that established by Miller and Lux. They formed the San Joaquin and Kings River Canal and Irrigation Company, which constructed the Main Canal in 1871, and the Outside Canal, which paralleled the Main Canal to the west, in the 1890s (Igler 2001:76). Miller and Lux also built the Dos Palos and Temple Slough Canals in about 1882 by improving existing natural sloughs along the San Joaquin River (Byrd et al. 2009:25). From these main canals grew a network of smaller canals and ditches, generally hand-built and fairly small by later standards, for irrigation and drainage of swamp lands.

Captain Thomas Jackson of USACE came to California in 1905 and began studying the Sacramento River. He understood that there was a linkage between the mining debris, making the river navigable, and flood control. Jackson undertook a comprehensive flood management plan for the Sacramento Valley. Jackson's plan, known as the Jackson Report, received Congressional approval and became the foundation for the Sacramento River Flood Control Project (Russo 2010:20; Kelley 1989:278, 280). In 1913, the San Joaquin River was added to the plan. By 1955, the Lower San Joaquin Levee District was established and a flood control plan, Plan A, was proposed. Plan A would eventually include the Eastside Bypass and Mariposa Bypass. Plan A was adopted in 1958, and all elements were completed by 1966 (Byrd et al. 2009:30).

Archival and Records Searches of the Project Area

An archival and records search was conducted of the project area at the Central California Information Center (CCIC), California State University, Stanislaus in 2007, 2008, and 2016.

No prehistoric resources were identified within the project area. Two historic period resources (P-24-000580 and P-24-001962) had been previously recorded and were rerecorded during the inventory survey (**Table 3.6-1**). Both cultural resources are detailed at length in an inventory survey report that has

been submitted to Reclamation. P-24-000580 has been previously evaluated and found not eligible for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR); P-24-001962 has not been formally evaluated.

The Stevinson/East Side Canal (P-24-000580) was previously determined not eligible for the CRHR/NRHP and will not be discussed further in this analysis.

Table 3-6-1. Summary of Cultural Resources Recorded during Inventory Survey within the Project Area.

Site Number	Type	Description
P-24-000580 (Update)	Historical	Two segments of the Stevinson/East Side Canal
P-24-001962	Historical	Three segments of the Eastside Bypass; levee, earthen dam; lower weir; dredge tailing; upper weir; earthen ditch; and concrete bridge
PL-2823-11-01	Historical	Irrigation canal extending east from Eastside Bypass
PL-SJRRP-FEAT-06	Historical	Portion of Mariposa Bypass and Control Structure
PL-2823-11-ISO-01	Historical	Two historic period bottles; isolated find, not a site
PL-2823-11-ISO-02	Historical	Historic period bottle; isolated find, not a site

Inventory Surveys within the Project Area

Cultural resources inventory surveys were conducted within the project area between May and November 2012 (Schneider et al. 2017). An additional pedestrian survey was conducted the week of August 7, 2017 (Holson 2017); only areas within the river channel were not surveyed, or 94% of the APE was surveyed while approximatley 6% was unsurveyed. A draft Historic Inventory and Evaluation Report was recently completed by JRP under contract to Reclamation (Norby and Wee 2017).

3.6.2 Regulatory Setting

The following section describes the laws, rules, regulations, and policies applicable to cultural resources in the project area at the Federal, State, and local level.

Federal

Cultural resources is a term used to describe both “archaeological sites” depicting evidence of past human use of the landscape through material culture and the “built environment,” which is represented in structures (such as dams and roadways) and buildings. Cultural resources also include traditional cultural properties, sites of religious or cultural significance, and sacred sites. The National Historic Preservation Act (NHPA) of 1966 (now Title 54 USC § 306108) is the primary Federal legislation which outlines the Federal Government’s responsibility to consider historic preservation. Other applicable cultural resources laws that could apply include, but are not limited to, the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001 et seq.), the Archaeological Resources Protection Act (ARPA), Advisory Council on Historic Preservation (ACHP) procedures outlined in the “Protection of Historic Properties” (36 CFR 800), and the Secretary of the Interior's Standards and Guidelines (FR 190: 44716–44742).

Section 106 of the NHPA requires the Federal government to take into consideration the effects of their actions on historic properties, defined as cultural resources that are listed or eligible for inclusion in the

National Register of Historic Places (National Register) and to allow the Advisory Council on Historic Preservation an opportunity to comment. The Section 106 process, outlined in the Federal regulations at 36 CFR Part 800, is a consultative process involving consultations with the State Historic Preservation Officer (SHPO), Indian tribes, and other interested parties. Although the Section 106 and NEPA processes are independent statutes, Reclamation uses the Section 106 process as its primary effort to identify cultural resources and to evaluate potential impacts as they apply to NEPA.

Native American Graves Protection and Repatriation Act

Much of the project will occur on land administered by USFWS and thereby triggering NAGPRA. NAGPRA requires Federal agencies and institutions that receive Federal funding to return Native American cultural items to lineal descendents of Indian tribes. Cultural items include human remains, funerary objects, sacred objects, and objects of cultural patrimony. NAGPRA also requires that Indian tribes be consulted whenever archaeological investigations encounter or are expected to encounter Native American cultural items or are unexpectedly discovered; all excavation or removal of such items must be done under procedures required by ARPA.

Indian Sacred Sites

Indian Sacred Sites are defined in Executive Order 13007 (May 24, 1996) as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." Federal lands potentially affected by the proposed project are the Merced NWR lands.

Other statutes, executive orders, regulations, and guidelines may be applicable to the proposed project depending on the Federal agencies involved, the nature of the permits or authorizations required, and whether or not cultural resources on Federal lands are affected.

National Register of Historic Places

The identification of historic properties, or cultural resources that have been listed or found eligible for listing in the NRHP, is outlined under 36 CFR Part 800.4. Criteria for evaluating the eligibility of cultural resources for listing in the NRHP may be found under NPS regulation 36 CFR 60.4. These criteria state that:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and
>
> 1) That are associated with events that have made a significant contribution to the broad patterns of our history, or
>
> 2) That are associated with the lives of persons significant in our past, or
>
> 3) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or

4) That have yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more of the above criteria, a cultural resource must also retain integrity to be considered eligible for listing in the NRHP. Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a Native American tribe to be eligible for inclusion in the NRHP.

State

California Environmental Quality Act

Under CEQA, historical resources are considered part of the environment, and a project that may cause a substantial adverse change to the significance of a historical resource is one that may have a significant impact on the environment. CEQA Guidelines (14 CCR Section 15064.5) define a historical resource as:

1) A resource listed or determined eligible for listing in the CRHR;

2) A resource included in a local register of historical resources, as defined in PRC Section 5020.1(k), or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or

3) Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record (14 CCR Section 15064.5[a][3]).

If a lead agency determines that a cultural resource constitutes a "historical resource," the provisions of PRC Section 21084.1 and *CEQA Guidelines* Section 15064.5 would apply. If a cultural resource does not meet the *CEQA Guidelines* criteria for a historical resource, then the site may yet be regarded as a "unique" archaeological resource following the provisions of PRC Section 21083.

CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of a project on that resource shall not be considered a significant effect on the environment (Section 15064[c][4]). Human remains, including those interred outside formal cemeteries, are protected under several State laws, including PRC Section 5097.98 and Health and Safety Code Section 7050.5. Impacts include intentional disturbance, mutilation, or removal of human remains.

California Environmental Quality Act — Tribal Cultural Resources

AB 52, effective on July 1, 2015, amends CEQA and adds new sections relating to Native American consultation and certain types of cultural resources, Tribal Cultural Resources (TCRs). TCRs are either (1) sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that is either on or eligible for inclusion in the CRHR or a local historic register; or (2) the lead CEQA agency (in this case, DWR), at its discretion and supported by substantial evidence, chooses to treat the resource as a TCR. Additionally, a cultural landscape may also qualify as a TCR if it meets the criteria to be eligible for inclusion in the CRHR and is geographically defined in terms of the size and scope of the landscape. Other historical resources (as described in California PRC 21084.1), a unique archaeological resource (as defined in California PRC 21083.2[g]),

or non-unique archaeological resources (as described in California PRC 21083.2[h]), may also be TCRs if they conform to the criteria to be eligible for inclusion in the CRHR.

AB 52 provides that a project with an effect that may cause a substantial adverse change in the significance of a TCR may have a significant effect on the environment. AB 52 requires the lead agency (in this case, DWR) to begin consultation with a California Native American Tribe that is traditionally and culturally affiliated with the geographic area of the project if the tribe requests the lead agency, in writing, to be informed by the lead agency through formal notification of projects that are proposed in that geographic area and the tribe subsequently requests consultation. California PRC Section 21084.3 states that "public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource."

Consultation with California Native American Tribes

Under PRC sections 21080.3.1 and 21082.3, the State must consult with tribes traditionally and culturally affiliated with the project area that have requested formal notification and responded with a request for consultation. The parties must consult in good faith. Consultation is deemed concluded when the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource when one is present or when a party concludes that mutual agreement cannot be reached. Mitigation measures agreed on during the consultation process must be recommended for inclusion in the environmental document. AB 52 consultation with Native American Tribes is described in Section 5.1.3, "Native American Consultation."

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). Criteria for evaluating the eligibility of prehistoric and historic period cultural resources for listing to the CRHR are based on NRHP criteria (PRC Section 5024.1[b]). Certain resources are determined to be automatically included in the CRHR, including California properties formally determined eligible for, or listed in, the NRHP; California Historical Landmarks from No. 770 onward; and California Points of Historical Interest that have been recommended by the State Historical Resources Commission for inclusion in the CRHR.

To be eligible for the CRHR, a resource must meet one or more of the following criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2. It is associated with the lives of persons important in our past;

3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4. It has yielded, or is likely to yield, information important in prehistory or history.

If nominated for listing in accordance with 5024.1(f), the CRHR may include individual historical resources; historical resources contributing to the significance of a historic district; historical resources identified as significant in historical resource surveys; and historical resources and historic districts

designated or listed as city or county landmarks pursuant to any city or county ordinance, if the criteria for designation or listing under the ordinance is consistent with CRHR criteria.

For a cultural resource to be eligible for the NRHP and/or the CRHR, it must also retain integrity. Integrity is the ability to convey the resource's significance. These characteristics are expressed through integrity of location, design, setting, materials, workmanship, feeling, and association. It should be noted that a property found to retain insufficient integrity to be NRHP eligible may be found to possess sufficient integrity to be CRHR eligible.

Local

Merced County General Plan

The *2030 Merced County General Plan* (County of Merced 2013) states that archeological, historical, architectural, and Native American cultural resources and values must be considered in all phases of planning and subsequent development projects, including design, permitting, construction, and long-term maintenance.

3.6.3 Environmental Effects

The following sections describe the environmental consequences or impacts of the project on cultural resources. The methods used to assess environmental impacts to cultural resources, the criteria used to define potential adverse effects or significant impacts, and the environmental consequences and mitigation measures of each alternative are detailed below.

Assessment Methods

An assessment of effects/impacts to prehistoric and historic period cultural resources within the project area relied on information gathered through archival and records searches, inventory surveys, agency consultation, meetings with Native American tribes, and sensitivity analyses (Reclamation and DWR 2012). For each project component, the horizontal extent and depth of disturbance was considered in the assessment.

Significance Criteria

Criteria for assessing adverse effects or significant impacts to cultural resources are outlined in Federal (36 CFR Part 800.5) and State (PRC Section 5024.1) regulations.

Federal Criteria

The analysis of potential effects to historic properties employs the Criteria of Adverse Effect as developed by the ACHP in its regulations for the "Protection of Historic Properties" (36 CFR Part 800.5).

Examples of adverse effects are outlined under regulation 36 CFR Part 800.5(2) and may be summarized as follows:

- Physical destruction of or damage to all or part of a property;
- Alteration of a property (e.g., restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation) that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;

- Removal of the property from its historic location or alteration of the character of the property's use, physical features, or setting as they contribute to the property's historic significance;
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration; and
- Transfer, lease, or sale of the property from federal ownership or control without adequate restrictions to ensure long-term preservation of the property's historic significance.

State Criteria

California regulations require that project impacts to cultural resources must be considered for resources listed in, or eligible for listing, in the CRHR (PRC Section 5024.1). Per PRC Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Substantial adverse change is defined under CEQA *Guidelines* (14 CCR Section 15064.5[b][1]) as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired."

No Action Alternative

Under the no action alternative, no construction-related activities would occur and no existing facilities would be modified. There would be no impact to cultural resources or TCRs.

Proposed Project (NEPA Analysis)

The Proposed Project has the potential to adversely affect one National Register-eligible property (Eastside Bypass and associated features) through modifications to the levees and control structures of the cultural resource. The Eastside Bypass is currently recommended as eligible for the NRHP under Criteria A and C. Contributing structures to the Eastside Bypass are the Eastside Bypass Control Structure, San Joaquin River Control Structure, Sand Slough Control Structure, and the levees that form the bypass. Non-contributing structures that do not appear eligible for the NRHP are the lower and upper USFWS weirs, earthen dam, dredge tailings, earthen ditch, and the concrete bridge. Additionally, one cultural resource (irrigation canal) was evaluated and recommended as not contributing to the significance of the Eastside Bypass and was evaluated as not eligible for the NRHP (Norby 2017).

Reclamation will initiate and continue Section 106 consultation with the SHPO and interested parties on direct and indirect effects to any historic properties, including the Eastside Bypass, and the resolution of any adverse effects, pursuant to 36 CFR Part 800.6. At this time, impacts to cultural resources cannot be fully determined, but will be completed prior to the final decision of this EA.

Indian Sacred Sites

Indian Sacred Sites are defined in Executive Order 13007 (May 24, 1996) as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the

existence of such a site." Federal lands potentially affected by the proposed project are the Merced NWR lands.

As part of cultural resources identification efforts, the NAHC was contacted on March 14, 2013. A request was made of the NAHC to conduct a search of their Sacred Lands File as well as to provide a list of Native American representatives who might have knowledge of cultural resources within the project area. The NAHC responded on March 25, 2013 that a search of their Sacred Lands File had failed to indicate the presence of Native American sacred sites in the project area. As a result of Reclamation's Tribal consultation effort, see Section 5.1.3, "Native American Consultation," no Sacred Sites have been identified through the consultation process.

There are no known Indian Sacred Sites on the Merced NWR. Since no known Indian Sacred Sites have been identified on Federal lands within the project area, there would be no direct, indirect, or cumulative impacts to Indian Sacred Sites from the proposed project. The proposed project would not have the potential to affect or prohibit access to any ceremonial use of Indian Sacred Sites. No further analysis is warranted.

Proposed Project (CEQA Analysis)

a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5? *(Less-than-Significant Impact)*

No Historical Resources/Historic Properties (i.e., resources previously identified either on or eligible for listing on the CRHR or NRHP, respectively) were identified during the records search or previous pedestrian surveys in the project area. However, three resources, P-24-001962 (Eastside Bypass/Levee and earthen dam, lower weir, dredge tailing, upper weir, earthen ditch, and concrete bridge), PL-SJRRP-FEAT-06 (portion of Mariposa Bypass/Levee and Control Structure), and PL-2823-11-01 (irrigation canal), are in the project area. DWR is not proposing modifications to PL-2823-11-01 (irrigation canal) and this irrigation canal is not discussed further in this analysis. DWR is treating the Eastside Bypass/Levee and associated features as a potentially historically significant district for the purposes of the CEQA impact analysis in this document. However, the only feature of that district that would be impacted by the proposed project is the Eastside Bypass levee. PL-SJRRP-FEAT-06 (portion of Mariposa Bypass/Levee and Control Structure) is being treated as potentially historically and individually significant for the purposes of the CEQA impact analysis in this document.

For the proposed project, DWR is responsible for reinforcing approximately 2 miles of the Eastside Bypass levee. Given the size of the Eastside Bypass and the contributing features, the proposed project would entail minor modifications to the levee, considered a contributing resource to the bypass. Improving the existing levees would not impact the levee's ability to convey its significance as a contributing resource. Its character-defining features (slope, crown, and shape) would be retained. Reinforcing approximately 2 miles would introduce a portion of new materials, but most of the levee's material (earth) would remain intact. It would keep integrity of location (it is not being moved); design (it will remain an earthen levee used for flood control purposes); setting (it is still in a rural area and levee improvements would not introduce new visual impacts to the setting); and feeling and association (it would retain its ability to provide a sense of its function). These six of the seven aspects of integrity are needed to convey its importance as an engineered structure and contributor to the Eastside Bypass district. This impact would be less than significant under CEQA.

The only portion of PL-SJRRP-FEAT-06 (portion of Mariposa Bypass/Levee and Control Structure) that is part of the proposed project is the modification to the Eastside Bypass Control Structure to improve fish passage. These modifications would not detract from the structure's ability to convey its significance. Its character-defining features would be retained (shape, number of bays, flood control gates) and would not result in a sufficient loss of the necessary aspects of integrity needed to explain its importance as an engineering feature. It would not be moved so integrity of location is retained. The removal of the boards would marginally impact its integrity of design and materials. There is enough of the structure not being altered such that there would be a minor loss of these aspects of integrity. The setting would not be changed because of the proposed project, and feeling and association would remain because the proposed project would continue to maintain its historic character. This impact would be less than significant under CEQA.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5? *(Less-than-Significant Impact)*

There is no evidence of the presence of buried archaeological sites in the project area. Without substantial evidence of an archaeological site, this impact would be less than significant. It is nevertheless possible that archaeological resources could be discovered during construction. In the event that archaeological resources are discovered during construction, DWR would implement Mitigation Measure CR-2a and CR-2b before and during project construction to reduce this potential impact under CEQA.

Mitigation Measure CR-2a: DWR will Implement Procedures for Inadvertent Discovery of Cultural Material.

If an inadvertent discovery of archaeological cultural materials (e.g., unusual amounts of shell, animal bone, any human remains, bottle glass, ceramics, building remains) is made at any other time during project-related construction activities or project planning, DWR, with input from other interested parties, will develop and implement appropriate protection and avoidance measures where feasible.

These procedures will be developed in accordance with 36 CFR 800.13, which specifies procedures for post-review discoveries, as well as in accordance with requirements for discoveries on Federal lands. Additional measures, such as development of a Memorandum of Agreement and a Historic Property Treatment Plan, may be necessary if avoidance or protection is not possible. All the steps identified above will be detailed in an accidental-discovery plan developed before construction so that all parties are aware of the process that must be implemented should buried archaeological resources be uncovered during construction.

Mitigation Measure CR-2b: DWR will Conduct Cultural Resource Awareness and Sensitivity Training.

DWR will hold a pre-construction training session for all construction personnel before the beginning of construction for each ground-disturbing project activity. All training sessions will be conducted in the field, in person, and in English. Participants will sign a form acknowledging that they have received the training and agree to keep resource locations confidential and to stop work within 100 feet of any unanticipated discovery. Topics to be addressed in training sessions will include but are not limited to: the purpose for monitoring (if being conducted); regulations

protecting cultural resources, including archaeological sites and Tribal Cultural Resources (TCRs); basic identification of archaeological resources and potential TCRs; and proper discovery protocols. Training, to be provided by DWR and a qualified archaeologist who meets the Secretary of the Interior's Standards for Archaeology (36 CFR Part 61), will include a presentation developed in coordination with culturally affiliated Tribal representatives. Topics will include the potential presence and type of Native American and non-Native American resources potentially found during construction or other activities, required procedures in the event of a discovery, proper behavior in the presence of sacred remains and human remains, and necessary reporting protocols. Written materials will be provided to trained personnel, as appropriate.

Although potential impacts to unanticipated cultural resources is less than significant without mitigation, implementation of Mitigation Measures CR-2a and -2b would further reduce any potential impacts to unanticipated cultural resources under CEQA.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Impacts related to destroying a unique paleontological resource or site or unique geologic feature are discussed in Section 3.15, "Paleontological Resources."

d) Disturb any human remains, including those interred outside of dedicated cemeteries? *(Less-than-Significant Impact)*

Although no human remains have been discovered in the project area, earth-moving activities could result in damage to or destruction of previously unidentified human remains which could be present within the project site. Because there is no evidence of the presence of human remains in the project area, this impact would be less than significant. It is nevertheless possible that human remains could be discovered during construction. In the event that human remains are discovered during construction, DWR would implement Mitigation Measure CR-3 before and during construction to reduce this impact under CEQA.

Mitigation Measure CR-3: DWR will Implement Procedures for Inadvertent Discovery of Human Remains.

If an inadvertent discovery of human remains is made at any other time during project-related construction activities or project planning, DWR will implement the procedures listed below, as well as in accordance with requirements for discoveries on Federal lands. Should human remains be identified in the project area, the following performance standards shall be met prior to implementing or continuing actions such as construction that may result in damage to or destruction of human remains. Avoiding or substantially lessening potential impacts to human remains or implementation of the procedures described below may be considered to avoid or minimize inadvertent discovery impacts and constitute the standard by which an impact conclusion of less than significant would continue to be reached:

- In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, DWR will immediately halt potentially damaging excavation in the area of the burial and notify the Merced County Coroner and a professional

archaeologist to determine the nature of the remains. The Coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (California Health and Safety Code Section 7050.5[b]). If the Coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (California Health and Safety Code Section 7050[c]). After the Coroner's findings have been made, the archaeologist and the NAHC-designated Most Likely Descendant (MLD), in consultation with the landowner, shall determine the ultimate treatment and disposition of the remains. The responsibilities of DWR for acting upon notification of a discovery of Native American human remains are identified in California PRC Section 5097.9 et seq.

- Upon the discovery of Native American human remains, DWR will require that all construction work must stop within 100 feet of the discovery until consultation with the MLD has taken place. The MLD will have 48 hours to complete a site inspection and make recommendations to the landowner after being granted access to the site. A range of possible treatments for the remains, including nondestructive removal, preservation in place, relinquishment of the remains and associated items to the descendants, or other culturally appropriate treatment may be discussed. California PRC Section 5097.98(b)(2) suggests that the concerned parties may mutually agree to extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. Site-protection measures that DWR will employ are as follows:

  - Record the site with the NAHC or the appropriate Information Center, and
  - Record a document with the County in which the property is located.

- If agreed to by the MLD and the landowner, DWR or their authorized representative will rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. If the NAHC is unable to identify an MLD, or if the MLD fails to make a recommendation within 48 hours after being granted access to the site, DWR or their authorized representative may also reinter the remains in a location not subject to further disturbance if he or she rejects the recommendation of the MLD and mediation by the NAHC fails to provide measures acceptable to DWR and/or Reclamation. DWR will implement mitigation to protect the burial remains. Construction work in the vicinity of the burials shall not resume until the mitigation is completed.

If the human remains are of historic age and are determined to be not of Native American origin, DWR will follow the provisions of the California Health and Safety Code Section 7000 (et seq.) regarding the disinterment and removal of non-Native American human remains. If human remains are encountered on Federal lands and are determined to be Native American, then implementation of Native American Graves Protection and Repatriation Act (NAGPRA) protocols will be initiated by Reclamation and/or USFWS, as the landowner.

Implementation of Mitigation Measure CR-3 would reduce any potential impacts from inadvertent discovery of human remains. The impact remains a less-than-significant impact under CEQA.

e) Cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and

scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources code section 5020.1(k), or

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.
(*Less-than-Significant Impact)*

No TCRs have been identified in the proposed project area as a result of consultation with Tribes that are culturally or traditionally affiliated with the proposed project area or as a result of archaeological investigations. Because no TCRs have been identified in or near the proposed project area, there would be no impact to TCRs.

Although no TCRs have been identified, it is nevertheless possible that such resources could be discovered during construction. In the event that TCRs such as Native American archaeological sites, features, sacred places, or objects with value to a Tribe that is culturally or traditionally affiliated with the proposed project area are discovered during construction, Mitigation Measure CR-4 shall be implemented. Although tribal consultation is ongoing, the current assessment is that impacts would be less than significant without mitigation, but mitigation is provided nonetheless.

Mitigation Measure CR-4: If Tribal Cultural Resources are Discovered during Construction, DWR will Implement Procedures to Evaluate Tribal Cultural Resources and Implement Avoidance and Minimization Measures to Avoid Significant Impact.

California Native American Tribes that are traditionally and culturally affiliated with the geographic area in which the proposed project is located may have expertise concerning their TCRs (California PRC Section 21080.3.1). As was done during consultation pursuant to PRC 21080.3.1 (AB 52), culturally affiliated Tribes will be further consulted concerning TCRs that may be impacted if these types of resources are discovered during construction. (The USFWS Regional Archaeologist will also be notified for TCRs discovered on refuge lands.) Further consultation with culturally affiliated Tribes will focus on identifying measures to avoid or minimize impacts on any such resources discovered during construction. Should TCRs be identified in the project area during construction, the following performance standards will be met prior to continuance of construction and associated activities that may result in damage to or destruction of TCRs:

Each identified TCR will be evaluated for California Register of Historical Resources (CRHR) eligibility through application of established eligibility criteria (California Code of Regulations 15064.636), in consultation with consulting Native American Tribes.

If a TCR is determined to be eligible for listing on the CRHR, DWR will avoid damaging effects to the TCR in accordance with California PRC Section 21084.3, if feasible. If DWR determines that the project may cause a significant impact to a TCR, and measures are not otherwise identified in the consultation process, the following are examples of mitigation capable of

avoiding or substantially lessening potential significant impacts to a TCR or alternatives that would avoid significant impacts to a TCR. These measures may be considered to avoid or minimize significant adverse impacts and constitute the standard by which an impact conclusion of less than significant may be reached:

i. Avoid and preserve resources in place, including, but not limited to, planning construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

ii. Treat the resource with culturally appropriate dignity taking into account the Tribal cultural values and meaning of the resource, including, but not limited to, the following:

1. Protect the cultural character and integrity of the resource.

2. Protect the traditional use of the resource.

3. Protect the confidentiality of the resource.

4. Establish permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or using the resources or places.

5. Protect the resource.

Although potential impacts to TCRs are less than significant without mitigation, implementation of Mitigation Measure CR-4 would further reduce any potential impacts to unanticipated cultural resources under CEQA.

3.7 Environmental Justice

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Beneficial Impact
VII. ENVIRONMENTAL JUSTICE – Would the project:					
a) Result in a disproportionately high and adverse effect on a minority or low-income population, which requires that the following three conditions be met simultaneously: 1) a minority or low-income population must reside in the affected area; 2) a high and adverse effect must exist; and 3) the effect on the minority or low-income population must be disproportionately high and adverse.	☐	☐	☐	☒	☐

3.7.1 Environmental Setting

Project-related construction and operations would occur in a rural agricultural area of Merced County, within the San Joaquin Valley. To characterize the environmental setting for environmental justice, data were evaluated to determine the geographic extent in which project-specific effects on proximate and adjacent minority and low-income populations could occur. The project area is located within U.S. Census Bureau Census Tract (CT) 9.01, which is composed of an area south of Merced that is roughly bounded by State Route 140 on the north, State Route 99 on the east, and the San Joaquin River on the west and south. By evaluating CT 9.01, the environmental justice analysis focuses on the smallest geographic area where U.S. Census data are available and has been applied to assess the effects specific to the populations in the vicinity of the project site. In addition, to provide a basis for comparing the localized study areas, environmental justice demographic data were evaluated for Merced County and the State of California.

Table 3.7-1 presents the racial and ethnic composition of CT 9.01, Merced County, and the State as a whole. As shown in **Table 3.7-1**, the Hispanic or Latino population in Merced County is greater than the corresponding population in the State as a whole. However, the Hispanic or Latino population in CT 9.01, where the project area is located, is substantially less than that of Merced County, and is not 50% greater than the State as a whole.

Table 3.7-2 presents the median household income, mean household income, proportion of unemployed individuals, and proportion of individuals living below the poverty threshold for CT 9.01, Merced County, and the State as a whole. The household incomes in CT 9.01, Merced County, and the State were all well above the poverty level in 2015.

Table 3.7-1. 2015 Demographic Characteristics

	Number of People (Percentage of the Total Population in Parentheses)		
	CT 9.01	Merced County	California
Population	4,072	268,455	39,144,818
Ethnicity[1]			
Hispanic or Latino	2,005 (49.2%)	156,110 (58.2%)	15,184,545 (38.8%)
White Alone, Not Hispanic	1,873 (46.0%)	77,568 (28.9%)	14,815,122 (37.8%)
Race[2]			
White	2,841 (69.8%)	154,331 (57.5%)	23,824,254 (60.9%)
Black/African American	129 (3.2%)	8,873 (3.3%)	2,277,229 (5.8%)
American Indian and Alaska Native	9 (0.2%)	1,519 (0.6%)	282,777 (0.7%)
Asian	71 (1.7%)	19,689 (7.3%)	5,548,936 (14.2%)
Native Hawaiian/Pacific Islander	0 (0%)	660 (0.2%)	157,554 (0.4%)
Some Other Race	829 (20.4%)	70,482 (26.3%)	5,300,297 (13.5%)
Two or More Races	193 (4.7%)	12,901 (4.8%)	1,753,771 (4.5%)
Total Minority[3]	**2,199 (54.0%)**	**190,887 (71.1%)**	**24,329,696 (62.2%)**

Notes: CT = census tract

[1] The term "Hispanic" is an ethnic category and can apply to members of any race, including respondents who self-identified as "White." The total numbers of Hispanic residents for each geographic region are tabulated separately from the racial distribution by the U.S. Census Bureau.

[2] A minority is defined as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic.

[3] Total Minority" is the aggregation of all non-white racial groups with the addition of all Hispanics, regardless of race, with the total for "While Alone, Not Hispanic" subtracted from the total population.

Source: U.S. Census Bureau 2015a, data compiled by CDM Smith in 2017.

Table 3.7-2. 2015 Income, Unemployment, and Poverty Characteristics

Geographic Area	Median Household Income	Mean Household Income	Unemployment Rate	Percent of Population Below Poverty Threshold
CT 9.01	$45,109	$84,059	9.9%	14.3%
Merced County	$41,997	$59,213	12.0	22.5%
California	$64,500	$91,757	7.3	11.3%

Note: CT = census tract

Source: U.S. Census Bureau 2015b, data compiled by CDM Smith in 2017

The data show that CT 9.01 and Merced County have a higher proportion of low-income residents (below the poverty threshold) and a higher unemployment rate as compared to the State as a whole. For the purposes of this analysis, areas where poverty levels are 50 percent greater than the State average of 11 percent (i.e., 22 percent or more of the population) would be considered meaningfully greater. Therefore, the percentages of the population below the poverty level in Merced County are meaningfully greater than the percentage of the general population in the State living in poverty.

3.7.2 Regulatory Setting

Federal

Executive Order 12898

The concept of environmental justice is rooted in the Civil Rights Act of 1964, which prohibits discrimination in Federally assisted programs, and Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* issued February 11, 1994. EO 12898 requires all Federal agencies to conduct "programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin." Section 1-101 of the EO requires Federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" of programs on minority and low-income populations.

Council on Environmental Quality and U.S. Environmental Protection Agency Guidelines

According to CEQ's *Environmental Justice: Guidance under the National Environmental Policy Act* (1997) and EPA's *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis* (EPA 1998), the first step in conducting an environmental justice analysis is to define minority and low-income populations. The second step of an environmental justice analysis requires that a determination be made as to whether a "high and adverse" effect would occur. The CEQ guidance indicates that when determining whether the effects are high and adverse, agencies are to consider whether the risks or rates of effect "are significant (as that term is defined by the NEPA lead agency) or above generally accepted norms." The final step requires a determination as to whether the effect on the minority or low-income population would be "disproportionately high and adverse." Although none of the published guidelines define the term "disproportionately high and adverse," CEQ (1997) includes a non-quantitative definition stating that an effect is disproportionate if it appreciably exceeds the risk to the general population.

Identification of an area that is potentially affected by the project and contains a disproportionate amount of low-income or minority residents does not, by itself, constitute an environmental justice effect. Rather, an environmental justice effect would occur if the project would disproportionately affect a population that is made up of 50 percent or greater of either the minority or low-income categories. If the jurisdiction has a population of 50 percent or greater for either the minority or low-income categories or has a population meaningfully greater (50 percent or greater) than the minority or low-income population percentage in the general population of the regional area, it is identified for more detailed analysis.

State

California Government Code Section 65040.12

California Government Code (CGC) Section 65040.12(e), defines environmental justice as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation and enforcement of environmental laws, regulations, and policies." CGC Section 65040.12(a) designates the Governor's Office of Planning and Research (OPR) as the coordinating agency in State government for environmental justice programs.

Senate Bill 115

In 1999, the legislature passed and Governor Gray Davis signed into law California's first environmental justice law, Senate Bill (SB) 115 (Solis, Chapter 690, Statutes of 1999). It established a definition of "environmental justice" in the CGC and directed the California Environmental Protection Agency (CalEPA) to conduct its programs, policies, and activities and promote the enforcement of all its existing health and environmental statutes "...in a manner that ensures the fair treatment of people of all races, cultures, and income levels, including minority populations and low-income populations in the state." The bill also designated OPR as the lead agency for coordinating environmental justice programs and several of the State's environmental and planning programs. Further, SB 115 also directed CalEPA to ensure greater public participation in the development, adoption, and implementation of environmental regulations and policies, and to improve research and data collection. SB 115 provided the procedural framework for environmental justice in California.

Senate Bill 89

Shortly after the passage of SB 115, California enacted SB 89 (Escutia, Chapter 728, Statutes of 2000) to guide and assist CalEPA in the implementation of SB 115. The bill required the establishment of the CalEPA Interagency Working Group on Environmental Justice to assist CalEPA in "...developing an agency-wide strategy for identifying and addressing any gaps in existing programs, policies, or activities that may impede the achievement of environmental justice."

CalEPA adopted the Intra-Agency Environmental Justice Strategy in 2004. Pursuant to California Public Resources Code Sections 71110–71113, CalEPA developed this policy to support the state's goal of "achieving fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation and enforcement of environmental laws and policies." Under SB 89, CalEPA is required to prepare a report to the Governor and Legislature every 3 years on the activities it has undertaken in achieving the objectives identified in the Intra-Agency Environmental Justice Strategy.

Local

There are no local plans, policies, regulations, or ordinances related to environmental justice that would apply to the proposed project.

3.7.3 Environmental Effects

No Action Alternative

Under the no action alternative, no construction-related activities would occur and no existing facilities would be modified. There would be no impact.

Proposed Project

a) Result in a disproportionately high and adverse effect on a minority or low-income population, which requires that the following three conditions be met simultaneously: a minority or low-income population must reside in the affected area, a high and adverse effect must exist, and the effect on the minority or low-income population must be disproportionately high and adverse? ***(No Impact)***

As shown in **Table 3.7-1**, the Hispanic or Latino population in Merced County is greater than the corresponding population in the State as a whole. However, the Hispanic or Latino population in CT 9.01, where the project area is located, is substantially less than that of Merced County, and is not 50% greater or meaningfully greater than the State as a whole.

As shown in **Table 3.7-2**, the household income levels are lower and percentages of population living below the poverty level in Merced County are higher than the State as a whole. However, the household income levels are higher, and the percentage of low-income population is substantially lower, in CT 9.01 as compared to Merced County. Furthermore, the population percentage below the poverty level in CT 9.01, Merced County, and the State does not exceed 50 percent, and the low-income population percentage in CT 9.01 is not meaningfully greater than either Merced County or the State.

Therefore, no disproportionately high and adverse effects on minority or low-income populations in CT 9.01 would occur, and there would be no impact. Even if the minority or low-income population was 50% greater or meaningfully greater than the State as a whole, the proposed project to improve fish passage and levee conditions would not disproportionately affect minority or low-income populations.

3.8 Geology and Soils

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Beneficial Impact
VIII. GEOLOGY AND SOILS – Would the project:					
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to California Geological Survey Special Publication 42.)	☐	☐	☒	☐	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	☐
iv) Landslides?	☐	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial risks to life or property?	☐	☐	☒	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒	☐

3.8.1 Environmental Setting

Regional Geology

The proposed project is located in the Central Valley Geomorphic Province, which encompasses the Sacramento and San Joaquin Valleys. It is an alluvial plain about 50 miles wide and 400 miles long, stretching from Redding to just south of Bakersfield. Alternating marine and continental deposits of Tertiary age underlie much of the Central Valley Province. The San Joaquin Valley is a structural trough into which sediments have been deposited as much as 6 miles deep, and is drained by the San Joaquin River. A review of the geologic map of the San Francisco-San Jose Quadrangle (Wagner et al. 1991)

indicates that the project area is composed of the Modesto Formation. The Eastside Bypass levee and Dan McNamara Road are composed of artificial fill, underlain by the Modesto Formation.

Local Soils

A review of U.S. Natural Resources Conservation Service (NRCS 2016) soil survey data indicates that the project elements would be constructed in several soil types consisting primarily of clay and clay loam. Relevant characteristics of each soil are presented in **Table 3.8-1**.

Based on soil boring data obtained by DWR, the foundation soils in Reach O where levee improvements are proposed generally consist of 1–20 feet of clay or silty clay with varying amounts of sand. The clay is underlain by layers of clayey sand, silty sand, or poorly graded sand. The thickness of the sand layer is approximately 2–10 feet. The foundation clay soils are generally classified as low to medium plasticity and stiff to hard consistency. Shallow clay soils were observed in landside far field borings drilled near Stations 1366+00, 1375+00, and 1396+00 and in a crest boring near Station 1428+00. Shallow silty soils were observed in borings drilled near Stations 1375+00, 1447+00, 1465+00 and 1494+00.

Seismicity and Neotectonics

Both the Sierra and Central Valley geologic provinces are subject to minor tectonic activity because they are part of the Sierra Nevada microplate, which is a component of a broad tectonically active belt that accommodates motion between the North American plate to the east and the Pacific plate to the west. The nearest "active" fault (i.e., evidence of displacement during the Holocene epoch) is the Ortigalita Fault, located in the Coast Ranges to the west. The Ortigalita Fault runs in a northwest to southeast direction through the San Luis Reservoir, approximately 25 miles west of the project area (Jennings and Bryant 2010). Under the Alquist-Priolo Act, active faults are considered to have a relatively high potential for surface rupture. The Ortigalita Fault is zoned under the Alquist-Priolo Act (California Geological Survey [CGS] 2017). The Kings Canyon Lineament (i.e., a geologic fault or surface fracture that is interpreted based on aerial imagery) crosses Dan McNamara Road approximately 1 mile north of the Eastside Bypass. However, the Kings Canyon Lineament has not shown evidence of displacement in the last 1.6 million years (Jennings and Bryant 2010) and therefore is not zoned under the Alquist-Priolo Act.

The intensity of ground shaking depends on the distance from the earthquake epicenter to the site, the magnitude of the earthquake, and site soil conditions. Ground motions from seismic activity can be estimated by probabilistic method at specified hazard levels and by site-specific design calculations using a computer model. The CGS Probabilistic Seismic Hazards Assessment Model (CGS 2008) indicates there is a 1-in-10 probability that an earthquake will occur within 50 years that would result in a peak horizontal ground acceleration exceeding 0.238 *g* (where *g* is the percentage of gravity). This indicates that a relatively low level of seismic ground shaking would be anticipated in the project area.

A liquefaction risk exists throughout the Central Valley in areas where unconsolidated, Holocene-age sediments and a high water table coincide such as near rivers and in wetland areas.

Table 3.8-1. Project Site Soil Types and Characteristics

Soil Type	Shrink-Swell Potential[1]	Permeability[2]	Drainage Class	Wind Erosion Hazard[3]	Water Erosion Hazard[4]	NRCS Soil Limitations for Roads and Levees
Eastside Bypass Control Structure						
Rossi clay loam, strongly saline-alkali, 0 to 1 percent slopes	Moderate	Moderately low	Poorly drained	6	Moderate	N/A
Dan McNamara Road Crossing						
Rossi clay, moderately saline-alkali, 0 to 1 percent slopes	Moderate	Moderately low	Poorly drained	4	Moderate	Very limited: shallow depth to saturated zone, low bearing strength, high shrink swell potential, flooding
Merced National Wildlife Refuge Weirs and Groundwater Well						
Rossi clay loam, moderately saline-alkali, 0 to 1 percent slopes	Moderate	Moderately low	Poorly drained	6	Moderate	N/A
Rossi clay, strongly saline-alkali, 0 to 1 percent slopes	Moderate	Moderately low	Poorly drained	4	Moderate	N/A
Eastside Bypass Levee Improvements						
Fresno loam, slightly saline-alkali, 0 to 1 percent slopes	Low	Moderately high	Moderately well drained	6	Moderate	Very limited: soil piping, thin soil layer
Fresno loam, moderately saline alkali, 0 to 1 percent slopes	Low	Moderately high	Moderately well drained	6	Moderate	Very limited: soil piping, thin soil layer
Fresno loam, strongly saline-alkali, 0 to 1 percent slopes	Low	Moderately high	Moderately well drained	6	Moderate	Very limited: soil piping, thin soil layer
Pozo clay loam, slightly saline, 0 to 1 percent slopes	Moderate	Moderately high	Moderately well drained	6	Low	Somewhat limited: soil piping, thin soil layer
Pozo clay loam, moderately saline, 0 to 1 percent slopes	Moderate	Moderately high	Moderately well drained	6	Low	Somewhat limited: soil piping, thin soil layer
Rossi clay loam, moderately saline-alkali, 0 to 1 percent slope	Moderate	Moderately low	Poorly drained	66	Moderate	Very limited: shallow depth to saturated zone, soil piping

Notes: N/A = not applicable; NRCS = U.S. Natural Resources Conservation Service

[1] Based on percentage of linear extensibility; shrink-swell potential ratings of "moderate" to "very high" can result in damage to buildings, roads, and other structures.

[2] Based on standard NRCS saturated hydraulic conductivity (Ksat) class limits. Ksat refers to the ease with which pores in a saturated soil transmit water.

[3] Soils assigned to wind erodibility group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

[4] Based on the erosion factor "Kw whole soil," which is a measurement of relative soil susceptibility to sheet and rill erosion by water.

Source: NRCS 2016