APPENDIX C

BIOLOGICAL EVALUATION TECHNICAL STUDY REPORT

LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

BIOLOGICAL EVALUATION
PIXLEY GROUNDWATER BANK
TULARE COUNTY, CALIFORNIA

Prepared by

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PN 1894-01

EXECUTIVE SUMMARY

Live Oak Associates, Inc. (LOA) conducted an investigation of the biological resources of 560-acres proposed for groundwater banking and 2,600 acres proposed for in-lieu groundwater banking near Pixley, Tulare County, California, and evaluated likely impacts to such resources resulting from site improvements. The following report is an analysis of impacts to the biological resources on or within the vicinity of the study area. On October 2 and 11, 2014, LOA biologists Wendy Fisher and Jeff Gurule surveyed the study area for biotic habitats, the plants and animals occurring in those habitats, and significant habitat values that may be protected by state and federal law.

Four land use/biotic habitats were identified within the study area, including agricultural land (orchards and field crops), ruderal areas (i.e. County road alignments, agricultural roads, irrigation ditches (including Harris Ditch), and concrete-lined Friant-Kern Canal), intermittent channel of Deer Creek, and agricultural ponds. Deer Creek is the only natural drainage channel that passes through the study area. A mix of urban and rural lands consisting of agricultural, commercial, and residential surrounds the site, within a region dominated by similar lands.

The study area does not provide suitable habitat for any locally occurring special status plant species; hence, the proposed project will not impact special status plants. Project impacts will also be less than significant for wildlife movement corridors, and many special status animal species that may regularly or occasionally forage or nest on the study area. Project impacts to jurisdictional waters would be considered insignificant.

The burrowing owl, San Joaquin kit fox, roosting bats, Swainson's hawk, white-tailed kite and other raptors, loggerhead shrike and other migratory birds, may occur onsite and have the potential to suffer construction-related mortality, which would be considered a significant impact. Project avoidance of native riparian trees, active nests, dens, and roost sites identified during preconstruction surveys, and implementation of avoidance and minimization measures will ensure that potential impacts to all special status animal species and native riparian trees are reduced to a less than significant level. If all mature riparian trees cannot be avoided, tree replacement will be required.

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1.0 INTRODUCTION

The South Valley Water Bank Authority, (hereinafter "project proponent") has proposed to develop, finance, manage and operate the Pixley Groundwater Banking Project ("Project") within certain agricultural lands of western Tulare County between the unincorporated communities of Pixley and Earlimart, east of SR 99 (identified as "Study Area" on Figure 1). The following technical report, prepared by Live Oak Associates, Inc. (LOA) in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), describes the biotic resources of the study area, and evaluates potential impacts to those resources that could result from development of a groundwater bank. The "study area" includes the approximately 2,600 acres of agricultural lands within the proposed in-lieu service area (not to be physically disturbed), along with 560 acres of other agricultural lands to be converted from agricultural use to groundwater recharge basins. The "project site" or "project footprint" refers to lands that will be subject to direct disturbance or modification of the land, including the 560 acres of recharge basins, and proposed pipelines, wells, a modified check structure, and turnout structures, for which the actual locations and total area will be defined in the final project design. The study area is located east of Highway 99, between Road 152 and the Friant-Kern Canal (FKC), north of Avenue 72, and south of Avenue 88 in southern Tulare County (Figure 1). Deer Creek traverses the study area from northeast to southwest and the FKC forms the eastern boundary. The study area can be found on the *Sausalito School* U.S.G.S. 7.5 minute quadrangle within Section 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, and 18, of Township 23 South, Range 26 East (Mt. Diablo Base and Meridian) (Figure 2).

1.1 PROJECT DESCRIPTION

As shown in Figure 3, the proposed project entails the following elements:

- A new turnout from the Friant-Kern Canal;
- A 4.5-mile, 48-inch diameter concrete pipeline to support recovery from the Bank and to convey water from both the well field at the recharge basins and the in-lieu service area back to the Friant-Kern Canal along the northern road shoulder of Avenue 80. Construction of the 48-inch pipeline will require trenching of approximately 5 feet in width. The width of temporary disturbance is anticipated to be approximately 40 feet but may vary depending on the need for shearing along its route. Temporary impacts to approximately 1,400 square feet (sf) of Deer Creek will result from trenching at the

pipeline crossing, which will occur west of the modified turn-out structure and east of the Road 160 bridge over Deer Creek. The pipeline will provide gravity delivery of supplies from the Friant-Kern Canal to the in-lieu service area for irrigation and to the recharge basins for direct recharge. After project implementation, Deer Creek will be used as a conduit for delivery of water taken from the Friant-Kern Canal upstream of the project area to the recharge basins for water banking in wet years;

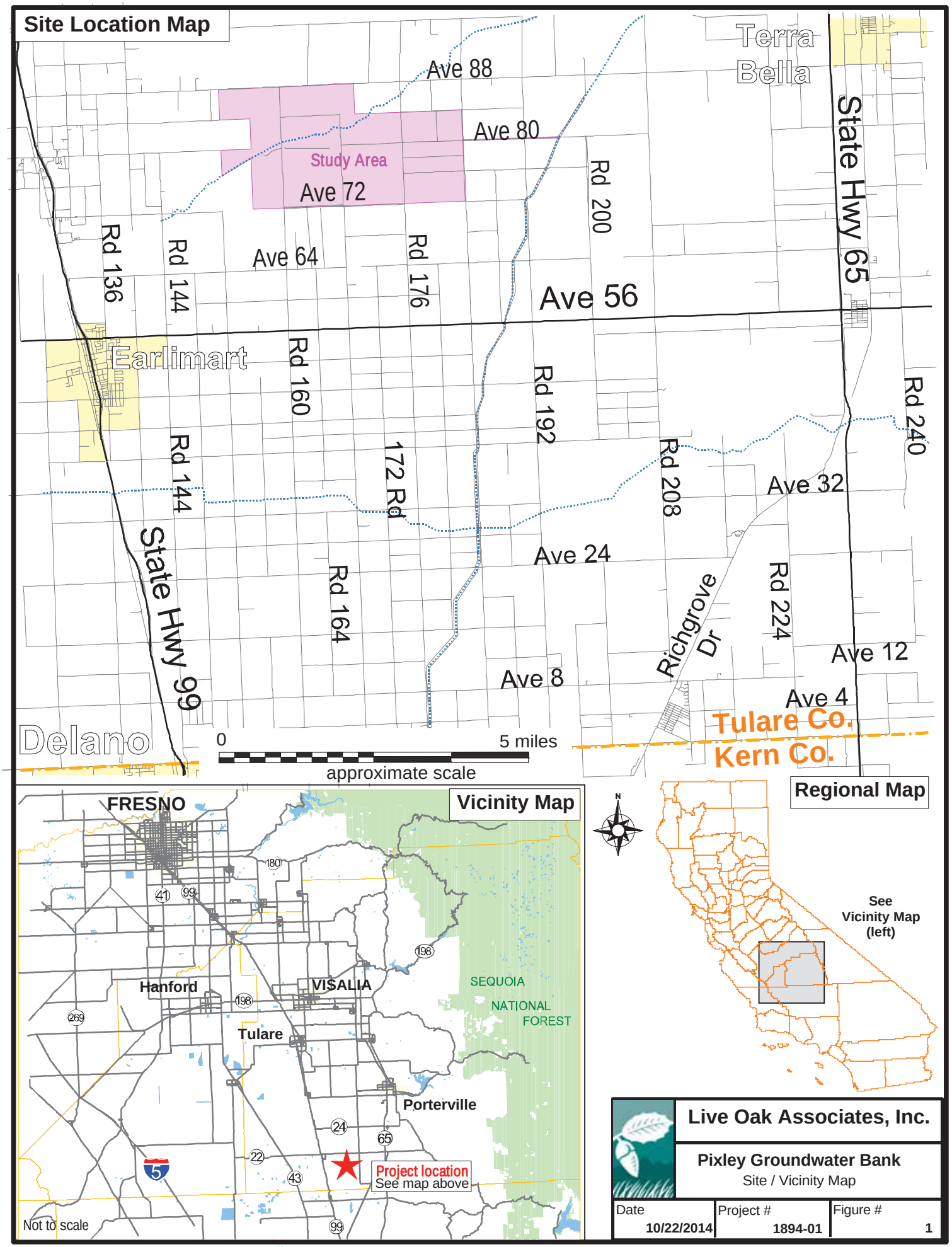
- Five (5) grower turnouts from the primary pipeline, control facilities, and six (6) groundwater recovery wells within 2,600 acres of in-lieu service area (2,200 irrigated acres). Wells and turnouts are anticipated to result in approximately 1,000 sf of temporary impact at each location. The in-lieu service area has a recharge capacity of approximately 6,500 acre-feet (af) of water per year. Exact placement of the wells and associated pipelines will ultimately depend on future finalized negotiations with landowners; locations shown on Figure 3 are conceptual. The five wells have a recovery capacity of 8,500 af over an 8-month period. Other than construction of the well sites and associated pipelines, land uses (including the existing agricultural regulating basins) within the in-lieu service area will not be affected by the proposed project;

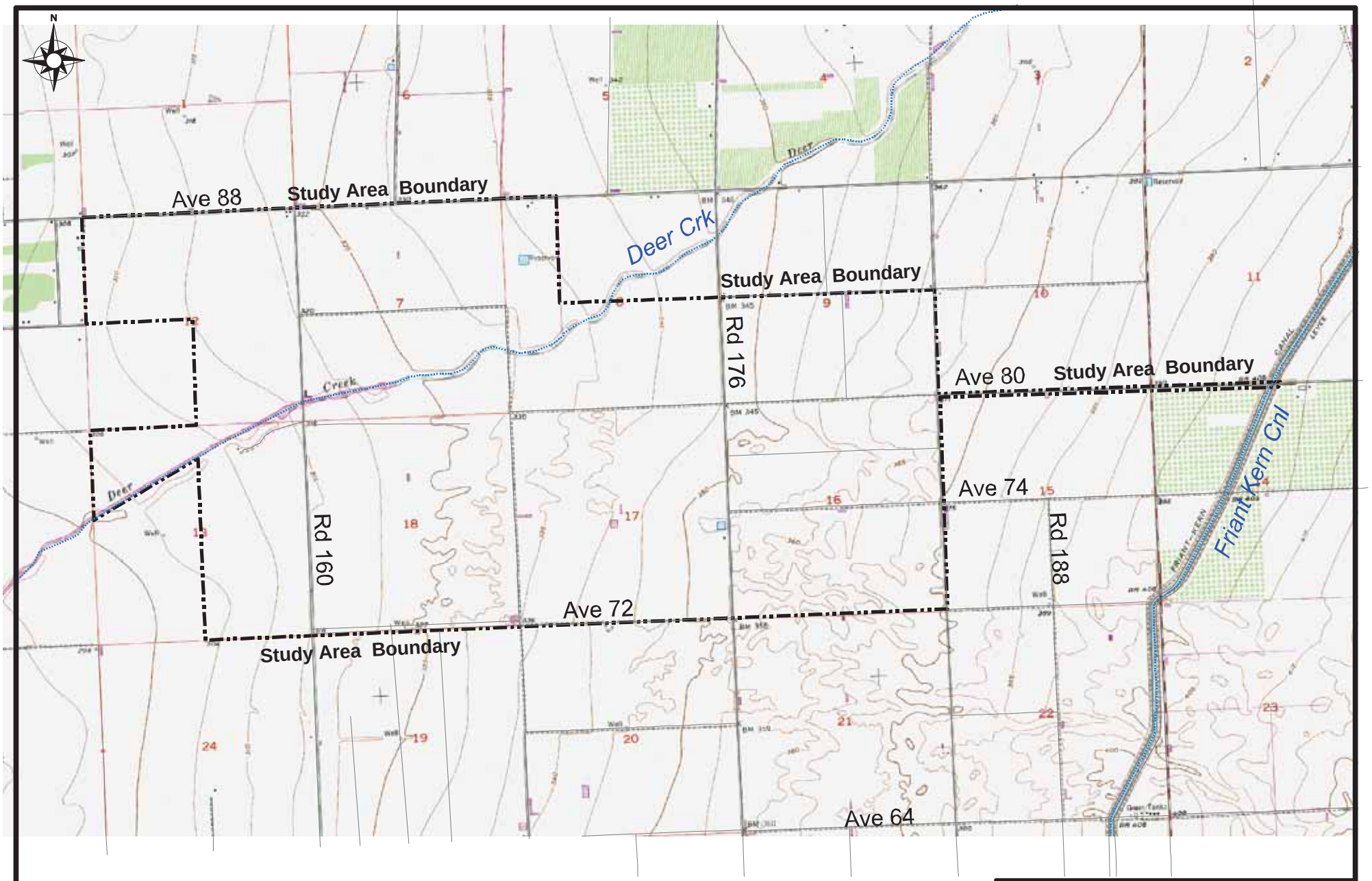
- 560-acres of recharge basins with a well field of eleven (11) recovery wells located within the boundaries of the basins. The basins are estimated to be inundated for approximately 52 days a year, have a recharge capacity of approximately 45,000 af per year and a recovery capacity of 25,400 af over an 8 month period. Land uses within these 560-acres will be modified by the project, with the exception of Harris Ditch, which passes through this area, but will not be affected by the proposed project;

- Pumping plants and associated electrical and control facilities to boost water recovered from the project's groundwater wells into the Friant-Kern Canal. The project will recover banked groundwater supplies and deliver them back to the Friant-Kern Canal to meet scheduled irrigation deliveries of CVP contractors within the Deer Creek, White River, Poso Creek and Kern Checks of the Friant-Kern Canal; and;

- Modification of the existing check structure on the north bank of Deer Creek to incorporate a new turn-out structure, resulting in a small amount of temporary and permanent impact to Deer Creek itself at this location. A new pipeline will be constructed that will take water from the modified check structure north to the recharge basins.

- The temporary staging area will consist of an approximately 4-acre triangular piece of land south of Deer Creek and west of Road 160. This area will be used as an equipment storage and laydown yard. It may also be used for employee parking or placement of a construction trailer. Temporarily disturbed areas would be restored after the completion of construction will return to agricultural land or other previous uses.


Site Location Map
Terra Bella
Ave 88
Ave 80
Study Area
Ave 72
Rd 200
State Hwy 65
Rd 136
Rd 144
Ave 64
Rd 176
Ave 56
Earlimart
Rd 160
Rd 192
Rd 240
Rd 144
172 Rd
Rd 208
Ave 32
State Hwy 99
Ave 24
Rd 164
Richgrove Dr
Rd 224
Ave 12
Ave 8
Ave 4
Delano
0
5 miles
approximate scale
Tulare Co.
Kern Co.
Vicinity Map
FRESNO
Hanford
VISALIA
Tulare
Porterville
SEQUOIA
NATIONAL
FOREST
Project location
See map above
Not to scale
Regional Map
See
Vicinity Map
(left)
Live Oak Associates, Inc.
Pixley Groundwater Bank
Site / Vicinity Map
Date
10/22/2014
Project #
1894-01
Figure #
1



2 miles 0 1 mile 2 miles

approximate scale

From USGS
Sausalito School 7.5' Quadrangle 1969

Live Oak Associates, Inc.

Pixley Groundwater Bank

U.S.G.S. Quadrangle

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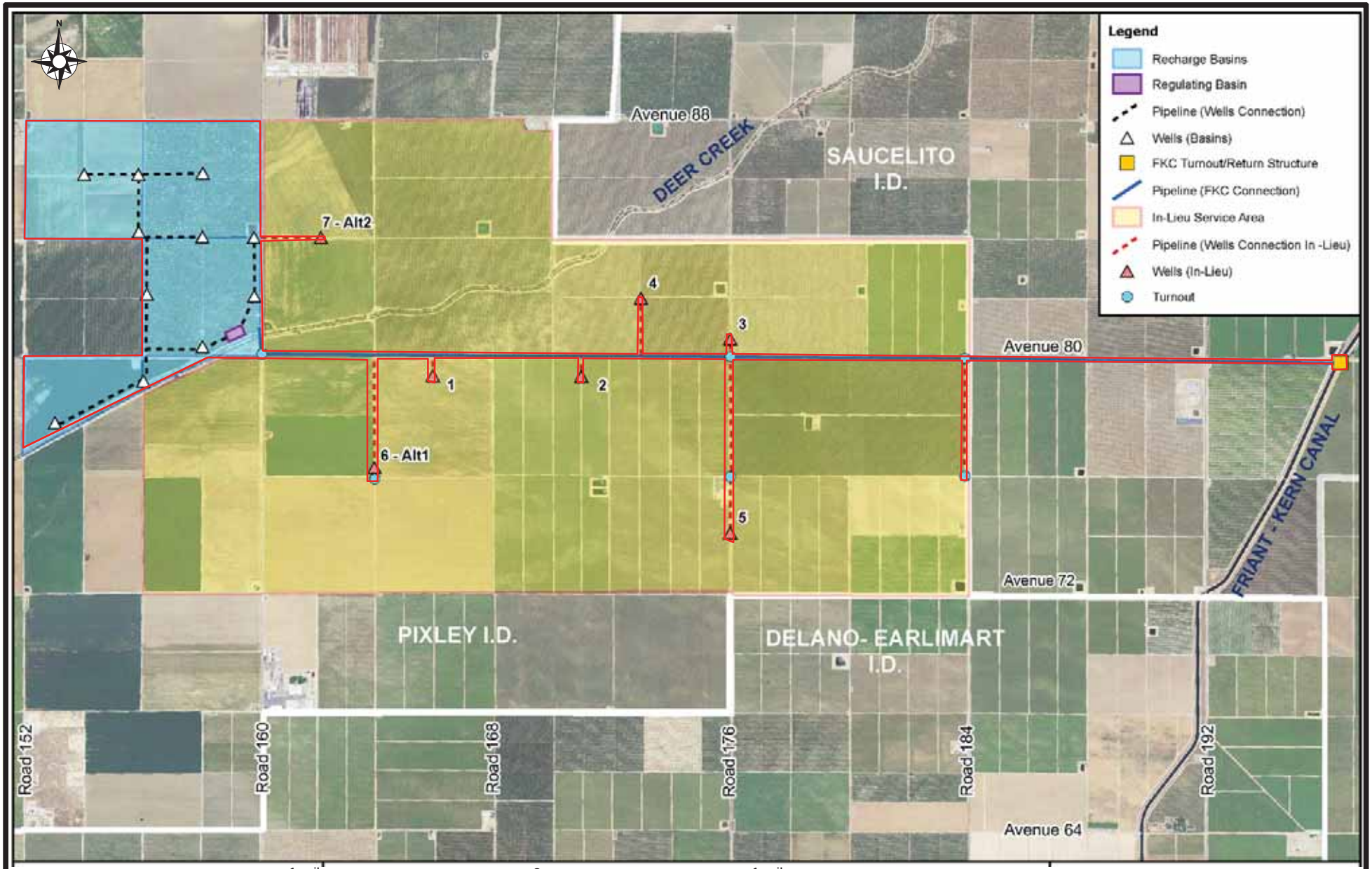

Approximate Project site

Map produced by
Provost & Pritchard Consulting Group 9/30/2014

Live Oak Associates, Inc.

Pixley Groundwater Bank
Site Plan

Date	Project #	Figure #
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- Access. With the exception of the pipeline crossing of Deer Creek and modification to the check structure, all of the proposed pipelines and wells would be adjacent to existing public roads or agricultural maintenance roads. In most cases, construction crews would be able to use unfarmed areas at the edges of fields for access without performing any grading or vegetation removal.

Project construction is expected to take 2 years between summer of 2015 and fall of 2017.

1.2 REPORT OBJECTIVES

Infrastructure projects such as the proposed Pixley Groundwater Recharge Project have the potential to damage or modify biological resources such as sensitive biotic habitats and the plant and wildlife species using them. In such cases, construction may be regulated by state or federal agencies, subject to provisions of CEQA and/or NEPA, or covered by policies of the County General Plan. In the case of the proposed project, funding from the United States Department of Interior, Bureau of Reclamation (USBR) necessitates environmental review consistent with the requirements of both CEQA and NEPA. Accordingly, this report includes the following:

- Summarize all site-specific information related to existing biological resources.
- Make reasonable inferences about the biological resources that could occur onsite based on habitat suitability and the proximity of the site to a species' known range.
- Summarize all state and federal natural resource protection laws that may be relevant to possible future site development.
- Identify and discuss project impacts to biological resources that may occur on the site within the context of CEQA and NEPA guidelines and relevant state and federal laws.
- Identify avoidance and mitigation measures that would reduce the magnitude of project impacts in a manner consistent with the requirements of CEQA and NEPA and that are generally consistent with recommendations of the resource agencies regulating affected biological resources.

1.3 STUDY METHODOLOGY

The analysis of impacts, as discussed in Section 3.0 of this report, is based on the known and potential biotic resources of the study area (discussed in Section 2.0). Sources of information used in the preparation of this analysis included:

- **Literature Search.** Literature that was reviewed included the *California Natural Diversity Data Base* (CDFW 2014), USFWS Endangered Species List Generator (USFWS 2016), California *Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2014), other technical studies recently completed by LOA for other projects in the area, U.S.G.S. topographic maps, and Natural Resource Conservation Service (NRCS) soil data.

- **Floristic Survey.** A driving and walking survey of the study area was conducted, during which all biotic habitats were described and vascular plants recorded. Particular attention was given to habitats of the study area that would be suitable, or potentially suitable, for special status plant species (i.e. federally listed species, state listed species, candidate species or CNPS 1B plants).

- **Wildlife Survey.** A driving and walking survey of the study area was conducted, during which all terrestrial vertebrates and their sign were recorded. Particular attention was given to habitats of the study area that would be suitable, or potentially suitable, for special status animal species (i.e. federally or state listed species, candidate species, or state species of special concern). Site specific or protocol level surveys for special status wildlife species were not conducted for this report.

- **Survey for Jurisdictional Waters**. A formal survey of the project site for jurisdictional waters was conducted, in which the boundaries of all potentially jurisdictional waters were recorded (Gibson & Skordal 2015).

LOA biologist Wendy Fisher toured the study area during the project kick-off meeting on September 18, 2014. Ms. Fisher and LOA biologist Jeff Gurule surveyed the study area on October 2, 2014. Mr. Gurule conducted a final field visit on October 11, 2014.

2.0 EXISTING CONDITIONS

2.1 REGIONAL SETTING

The study area is located at the eastern edge of the Tulare Lake Basin between the foothills of the southern Sierra Nevada and the former location of Tulare Lake. Deer Creek, which originates in the southern Sierra, was one of several tributaries of Tulare Lake. It emerges from the southern Sierra foothills southeast of Porterville and enters the Tulare Lakebed to the east of the town of Alpaugh. Between these two locations, Deer Creek traverses an alluvial plain created by the melt waters of heavy Sierra snowpacks and glaciers dating back to the Pleistocene. Elevations of the Tulare Lake Basin where it meets the lowest Sierra foothills range from 500 to 600 feet National Geodetic Vertical Datum (NGVD). The creek discharged into Tulare Lake at an elevation of approximately 210 feet NGVD (surface elevations of the lake fluctuated from year to year). Therefore, the nearly level plain the creek traverses from the eastern boundary of the San Joaquin Valley to the Tulare Lake lakebed slopes slightly from east to west, losing approximately 475 feet of elevation over a distance of nearly 30 miles.

Like most of California, the Tulare Lake Basin (and the study area), experience a Mediterranean climate. Warm dry summers are followed by cool moist winters. Summer temperatures commonly exceed 100 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely rise much above 70 degrees Fahrenheit, with daytime highs often below 60 degrees Fahrenheit. Average annual precipitation within the study area varies from about 10 to 12 inches, most of which falls between the months of October and March. All precipitation falls in the form of rain.

While that portion of the Tulare Lake Basin covered by this report is drained by Deer Creek and its distributaries, the larger Tulare Lake Basin is dissected by a number of significant rivers and creeks, including the Tule, Kings, Kaweah, and the Kern. Smaller drainages such as the White River, also contribute to the basin. Together, these drainages fed Tulare Lake, the largest freshwater lake in the western United States at the time of California's settlement by American immigrants in the mid-19th century.

Historically, the broad plain of the Tulare Lake Basin located east of Tulare Lake and west of the Sierra foothills was a mosaic of wetlands, riparian habitats, valley oak savannah, and native grasslands. Rivers tributary to Tulare Lake, as well as their distributary channels and creeks, supported broad corridors of riparian vegetation. Extensive marshes formed around the margins of the lake itself. Between the riparian habitats, marshes, and seasonal wetlands were expansive areas of drier habitats such as perennial grassland and valley oak savannah. These habitats supported a considerable diversity of native wildlife, including large numbers of winter waterfowl, Tule elk, pronghorn, mule deer, grizzly bears, and cougars.

By the beginning of the 20th century, Tulare Lake began to shrink in size due to land reclamation and water diversions. Large dams constructed on the Kings, Kaweah, Tule, and Kern Rivers within the past 60 years now impound water that once flowed into Tulare Lake. Deprived of flows from its major tributaries, the lake no longer exists, although during especially wet winters some vestiges of the lake reappear for brief periods of time (Kenny Phelps pers. comm.). The lakebed now constitutes fertile farmland. The mosaic of wetlands, riparian habitats, oak savannah, and perennial grasslands once occurring to the east of the lake has almost entirely been converted to irrigated agricultural lands. The remaining vestiges of native riparian habitat along the major rivers of the Tulare Lake Basin are nonetheless valuable habitat for many native wildlife species, particularly avian species. Pockets of grassland, wetland, and alkali sink scrub habitat, as well as undisturbed lands around the margins of the Tulare Lake Basin, continue to provide limited habitat for native vertebrate species including various reptiles, many birds, and mammals such as pocket mice, kangaroo rats, and kit fox. Lands surrounding the study area consist primarily of farmed lands.

2.2 STUDY AREA

The study area includes areas within the footprint of groundwater recharge facilities, as well as the in-lieu service area that will benefit from the project. With the exception of the wells and pipelines to be constructed at locations yet to be determined, the Project does not propose any alteration of the lands within the in-lieu service area.

TABLE 1. SOILS OF THE STUDY AREA.

Soil Series	Parent Material	Drainage	Hydric?
Akers-Akers, saline-sodic, complex 0-2% slopes	Alluvium derived from Granite	Well Drained	Yes, in depressions
Biggriz-Biggriz, saline-sodic, complex, 0-2% slopes	Alluvium derived from Granite	Somewhat poorly drained	Yes, in depressions
Calgro-Calgro, saline-sodic, complex, 0-2% slopes	Alluvium derived from Granite	Moderately Well Drained	Yes, in depressions
Centerville clay, 0-2% slopes	Alluvium derived from Granite	Well Drained	Yes, in depressions
Colpien loam, 0-2% slopes	Alluvium derived from Granite	Well Drained	No
Crosscreek-Kai association, 0-2% slopes	Alluvium derived from Granite	Moderately Well Drained	Yes, in depressions
Exeter loam, 0-2% slopes	Alluvium derived from Granite	Moderately Well Drained	Yes, in depressions
Flamen loam, 0-2% slopes	Alluvium derived from Granite	Moderately Well Drained	Yes, in depressions
Hanford sandy loam, 0-2% slopes	Alluvium derived from Granite	Well Drained	Yes, in drainage ways
Riverwash	Alluvium		Yes, in drainage ways

As previously noted, the study area is relatively level, sloping slightly from east to west. Soils of the study area include 10 soil types from 11 soil series (Table 1). These soils have been significantly disturbed by years of agricultural practices, road building, and the leveeing of Deer Creek. As a result, the soils of the site have no particular significance to biological resources potentially occurring on the site.

2.3 LAND USES/BIOTIC HABITATS WITHIN THE STUDY AREA

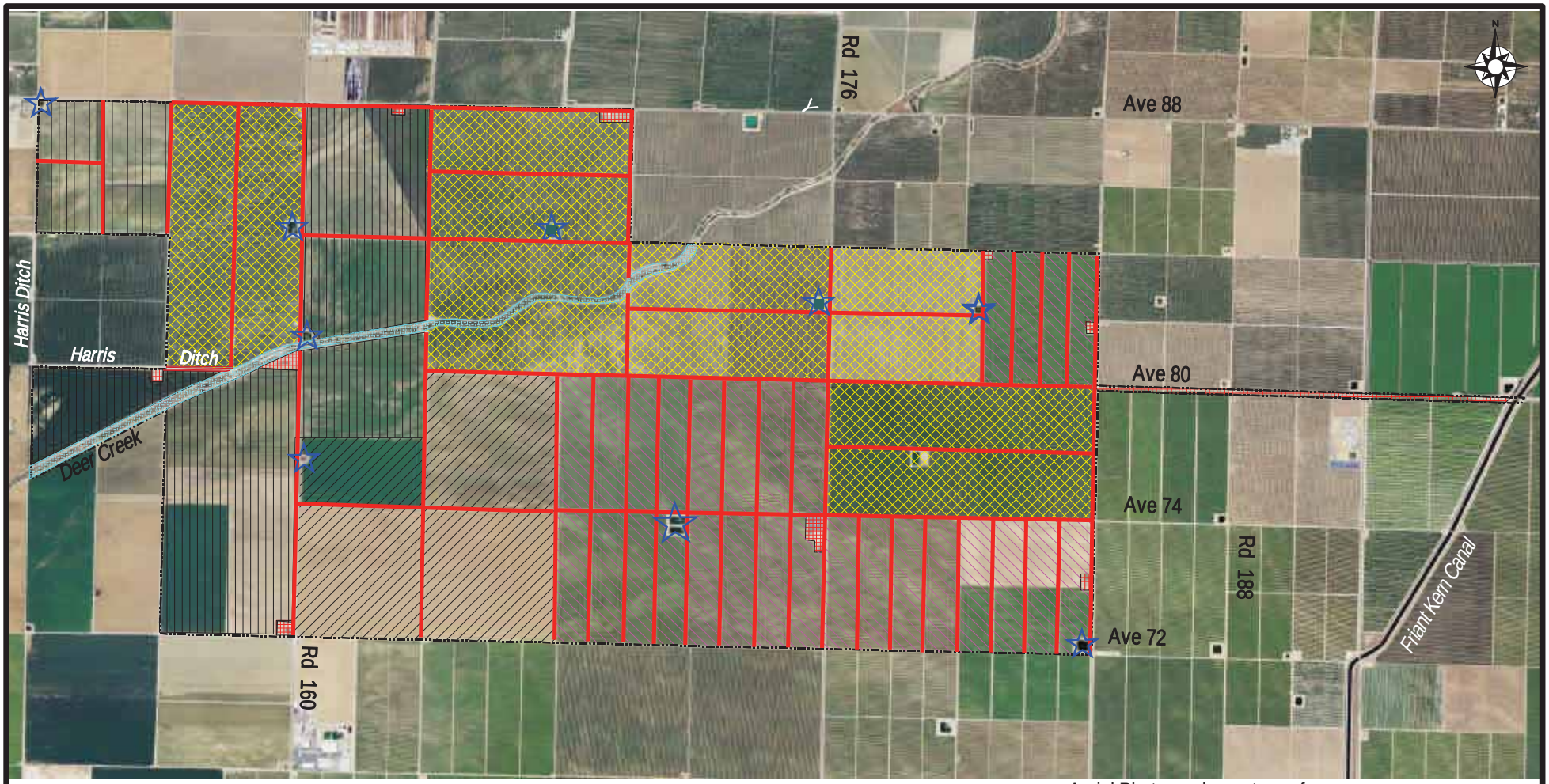
Four land use/biotic habitats were identified within the study area, including agricultural land (orchards and field crops), ruderal areas (i.e. County road alignments, agricultural roads, Harris Ditch, and concrete-lined Friant-Kern Canal), intermittent channel of Deer Creek, and agricultural ponds (Figure 4). Native and naturalized habitats were limited to the Deer Creek corridor. Natural terrestrial and aquatic communities were absent from the remainder of the study area.

The vegetation associations and likely complement of wildlife species occurring on the study area are described below. A list of the vascular plants observed within the study area can be found in Appendix A. A list of the animal species observed and expected to occur within the study area can be found in Appendix B. Photographs of the site are presented in Appendix C.

2.3.1 Agricultural Land

Agricultural land comprised the vast majority of the study area and consisted of orchard, vineyard, annual and perennial crops. More specifically, these lands consisted of orchards of almond trees (*Prunus dulcis*) and pistachio (*Pistacia vera*), annual field crops of corn (*Zea mays*), cotton (*Gossypium hirsutum*), and sorghum (*Sorghum bicolor ssp. bicolor*), and a small field of perennial alfalfa (*Medicago sativa*). All agricultural areas being cultivated with alfalfa are located south of the Deer Creek channel in the in-lieu fee area (see Figure 4). Aside from the agricultural crops themselves, all agricultural areas supported little vegetation. The vegetation observed consisted primarily of non-native agricultural weed species such as Palmer's amaranth (*Amaranthus palmeri*), horseweed (*Erigeron canadensis*), large crabgrass (*Digitaria sanguinalis*), and Mexican sprangletop (*Leptochloa fusca ssp uninervia*), among others.

Intensive agricultural practices within the agricultural lands limit their value to wildlife; however, some wildlife species would occur in these areas in limited numbers. Amphibians with the potential to use agricultural areas of the site include Pacific chorus frogs (*Pseudacris regilla*) and western toads (*Bufo boreas*). Reptiles that could occur in the fields include the side-blotched lizard (*Uta stansburiana*), Pacific gopher snake (*Pituophis catenifer catenifer*), and common kingsnake (*Lampropeltis getulus*).



LEGEND

- Approximate Study Area
- Agricultural Pond
- Deer Creek
- Ruderal

Agriculture Classifications

- Orchard
- Vineyard
- Perennial Alfalfa Field
- Annual Agricultural Field

1 mile 0 1 mile
approximate scale

Aerial Photograph courtesy of
U.S.D.A. FSA Aerial Photography Field Office 10/22/2012

Live Oak Associates, Inc.

Pixley Groundwater Bank
Land Uses / Biotic Habitats

Date	Project #	Figure #
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Agricultural lands also provide foraging habitat for a number of avian species. Common resident species likely to forage in agricultural areas of the site include mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), western scrub jay (*Aphelocoma californica*), and northern mockingbird (*Mimus polyglottos*), as well as mixed flocks of Brewer's blackbird (*Euphagus cyanocephalus*), brown-headed cowbird (*Molothrus ater*), and European starling (*Sturnus vulgaris*). Summer migrants that would be common on agricultural lands of the site include the western kingbird (*Tyrannus verticalis*) while common winter migrants include the savannah sparrow (*Passerella sandwichensis*) and American pipit (*Anthus rubescens*).

A few mammal species may also occur within the agricultural lands of the site. Small mammals such as deer mice (*Peromyscus maniculatus*) and California voles (*Microtus californicus*) would occur in fluctuating numbers depending on the season and type of crop grown. Botta's pocket gopher (*Thomomys bottae*) and California ground squirrel (*Otospermophilus beecheyi*) generally concentrate their burrows around the perimeter of agricultural lands. Various species of bat may also forage in these areas for flying insects.

The presence of amphibians, reptiles, birds and small mammals is likely to attract foraging raptors and mammalian predators. Raptors such as red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), and American kestrel (*Falco sparverius*) would likely forage over agricultural lands of the site. Mammalian predators occurring in agricultural lands of the site would most likely be limited to raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*) and red fox (*Vulpes vulpes*), as these species are relatively tolerant of human disturbance.

2.3.2 Ruderal

Ruderal (disturbed) areas consisted of the dirt and paved roads and road shoulders of the site, agricultural roads, as well as agricultural irrigation ditches and basins, and the concrete-lined bank and paved levee road of the FKC. Ruderal areas contained a sparse cover of common agricultural weeds, which included annual burweed (*Ambrosia acanthicarpa*), barnyard barley (*Hordeum murinum ssp. leporinum*), puncture vine (*Tribulus terrestris*), and Bermuda grass (*Cynodon dactylon*).

Although the wildlife habitat value of ruderal lands within the study area is relatively low, some wildlife species certainly occur within these lands on occasion. The reptile and amphibian species listed for agricultural lands could potentially occur in ruderal habitats of the site. Avian species occurring in agricultural lands would also be expected to occur within ruderal lands of the site. In particular, mourning dove, American crow, and the disturbance-tolerant killdeer (*Charadrius vociferous*), which was observed on the concrete banks of the Friant-Kern Canal.

Small mammals that would be expected to occur on ruderal lands of the study area include California ground squirrel, Botta's pocket gopher, deer mouse, California vole, and house mouse. Mammalian predators with the potential to occur on ruderal lands of the study area include disturbance-tolerant species such as the raccoon, red fox, and coyote.

2.3.3 Deer Creek

Although a 2.5 mile stretch of Deer Creek falls within the study area, only 1,500 linear feet falls within the Project footprint (see Figure 3). At the time of the biological field survey, the segment of Deer Creek within the Project site consisted of vegetated channel banks with a dry, sandy bed nearly devoid of vegetation. A few riparian trees in poor to fair condition occurred sporadically along the channel banks, and included Fremont's cottonwood (*Populus fremontii*) and red willow (*Salix laevigata*). Shrubs were sparsely distributed, but included sandbar willow (*Salix exigua*) and mulefat (*Baccharis salicifolia*). Grasses observed in the Deer Creek corridor included non-wetland species such as ripgut (*Bromus diandrus*), red brome (*Bromus madritensis*), Johnson grass (*Sorghum halepense*), and barnyard barley. Forbs observed included horseweed, stinging nettle (*Urtica dioica*), curly dock (*Rumex crispus*), jimson weed (*Datura sp.*), mugwort (*Artemisia douglasiana*), black mustard (*Brassica nigra*), and others.

A number of animal species use this habitat for foraging and breeding. Amphibian species potentially breeding in this area during periods of inundation would be the Pacific chorus frog and western toad. Reptile species expected to occur in this habitat include western fence lizard (*Sceloporus occidentalis*), gopher snake, and western rattlesnake (*Crotalus oreganus*), among others. Birds common to this habitat include blue grosbeak (*Passerina caerulea*), savannah sparrow (*Passerculus sandwichensis*), white-crowned sparrow (*Zonotrichia leucophrys*), dark-

eyed junco (*Junco hyemalis*), loggerhead shrike (*Lanius ludovicianus*), lesser goldfinch (*Carduelis psaltria*), and western kingbird, to name a few.

Mammal species expected within this habitat include Virginia opossum (*Didelphus virginianus*), raccoon, striped skunk, California ground squirrel, Botta's pocket gophers desert cottontail (*Sylvilagus audobonii*), black-tailed hare (*Lepus californicus*), and coyote.

2.3.4 Agricultural Ponds

Two agricultural ponds were observed within agricultural lands on the project site. Both ponds were inundated during LOA's field surveys. These included an approximately 1.3 acre irrigation holding pond that received water from nearby wells and an approximately 0.3 acre tail water return pond. The large irrigation pond located northwest of Avenue 84 and Road 160 intersection was nearly devoid of vegetation, with the exception of a thick matt of algae and a relatively small cluster of cattails (*Typha latifolia*). The tail water return pond located at the northwestern corner of the site south of Avenue 88 contained some wetland vegetation dominated by false daisy (*Eclipta prostrata*) and spotted ladysthumb (*Persicaria maculosa*). Both ponds had relatively steep embankments and are highly disturbed by regular maintenance including clearing of vegetation. An additional 8 irrigation ponds occur within the study area, but are not described here as they will not be altered by this project.

Some native wildlife species are expected to make use of these ponds. Amphibian species potentially breeding in this area during periods of inundation would be the Pacific chorus frog and western toad. Reptile species potentially occurring in these areas would likely be limited to common side-blotched lizards and Pacific gopher snakes.

Avian species expected near these ponds include the black phoebe (*Sayornis nigricans*) and cliff swallows (*Petrochelidon pyrrhonota*), which would forage for flying insects over the ponds. Wading birds such as the green heron (*Butorides virescens*), snowy egret (*Egretta thula*), and great egret (*Ardea alba*) may use the ponds from time to time. Various species of bat may forage over the ponds for flying insects.

Small mammal species would be expected to occur within surrounding agricultural lands would also be expected to occasionally utilize the agricultural ponds. Being highly maintained with

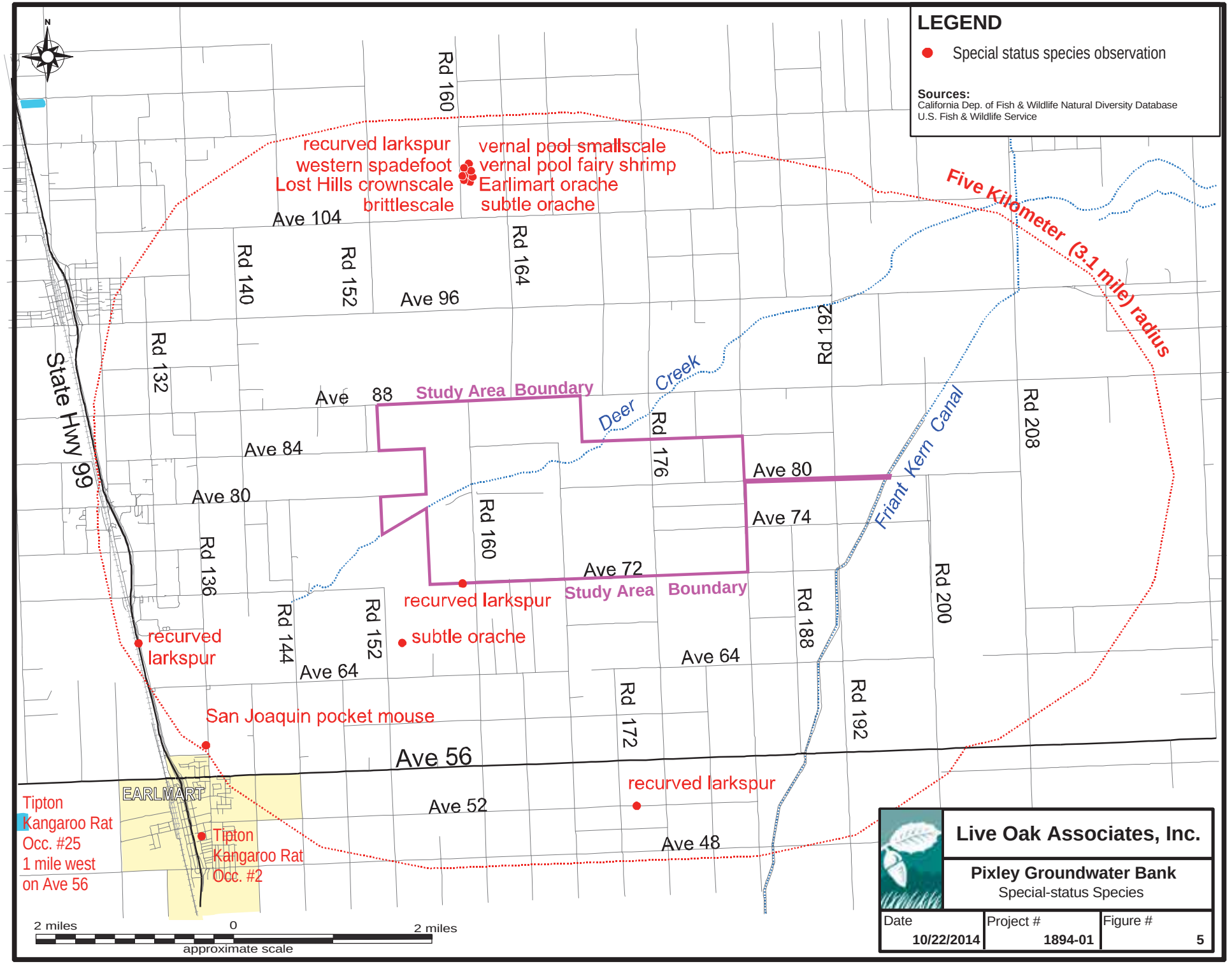
steep embankments and little vegetative cover, small mammals would not be particularly attracted to the ponds.

2.4 SPECIAL STATUS PLANTS AND ANIMALS

Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.1, state and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as threatened or endangered under state and federal endangered species legislation. Still others have been designated as "species of special concern" by the CDFW. The California Native Plant Society (CNPS) has developed its own lists of native plants considered rare, threatened or endangered (CNPS 2014). Collectively, these plants and animals are referred to as "special status species."

Special status plants and wildlife occurrences within the project vicinity, and their potential for occurrence on the study area, have been identified in Table 2 and Figures 5 and 6. Sources of information for Table 2 included the *California Natural Diversity Data Base* (CNDDB) (CDFW 2014), *USFWS List of Endangered, Threatened, and Proposed Species* (USFWS 2016) (see Appendix D), *Annual Report on the Status of California State Listed Threatened and Endangered Animals and Plants* (CDFG 2014), *The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2014), and *California's Wildlife, Volumes I, II, and III* (Zeiner et. al. 1988).

The CNDDB was used to search the nine U.S.G.S. 7.5 minute quadrangles containing and immediately surrounding the study area (*Sausalito School, Ducor, Richgrove, Delano East, Delano West, Pixley, Tipton, Woodville, and Porterville*) for special status plant and animal species and natural communities of special concern. The same nine quadrangles were queried for federally listed species and designated critical habitat using the Sacramento USFWS office's Endangered Species List Generator (USFWS 2016).


LEGEND
Special status species observation
Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
recurved larkspur
western spadefoot
Lost Hills crownscale
brittlescale
vernal pool smallscale
vernal pool fairy shrimp
Earlimart orache
subtle orache
Five Kilometer (3.1 mile) radius
Study Area Boundary
Deer Creek
Friant Kern Canal
State Hwy 99
Rd 160
Rd 140
Rd 152
Rd 164
Rd 132
Rd 176
Rd 192
Rd 208
Rd 136
Rd 144
Rd 188
Rd 200
Rd 172
Ave 104
Ave 96
Ave 88
Ave 84
Ave 80
Ave 74
Ave 72
Ave 64
Ave 56
Ave 52
Ave 48
recurved larkspur
subtle orache
recurved larkspur
San Joaquin pocket mouse
recurved larkspur
EARLMART
Tipton Kangaroo Rat Occ. #25
1 mile west on Ave 56
Tipton Kangaroo Rat Occ. #2
2 miles
0
2 miles
approximate scale
Live Oak Associates, Inc.
Pixley Groundwater Bank
Special-status Species
Date 10/22/2014
Project # 1894-01
Figure # 5

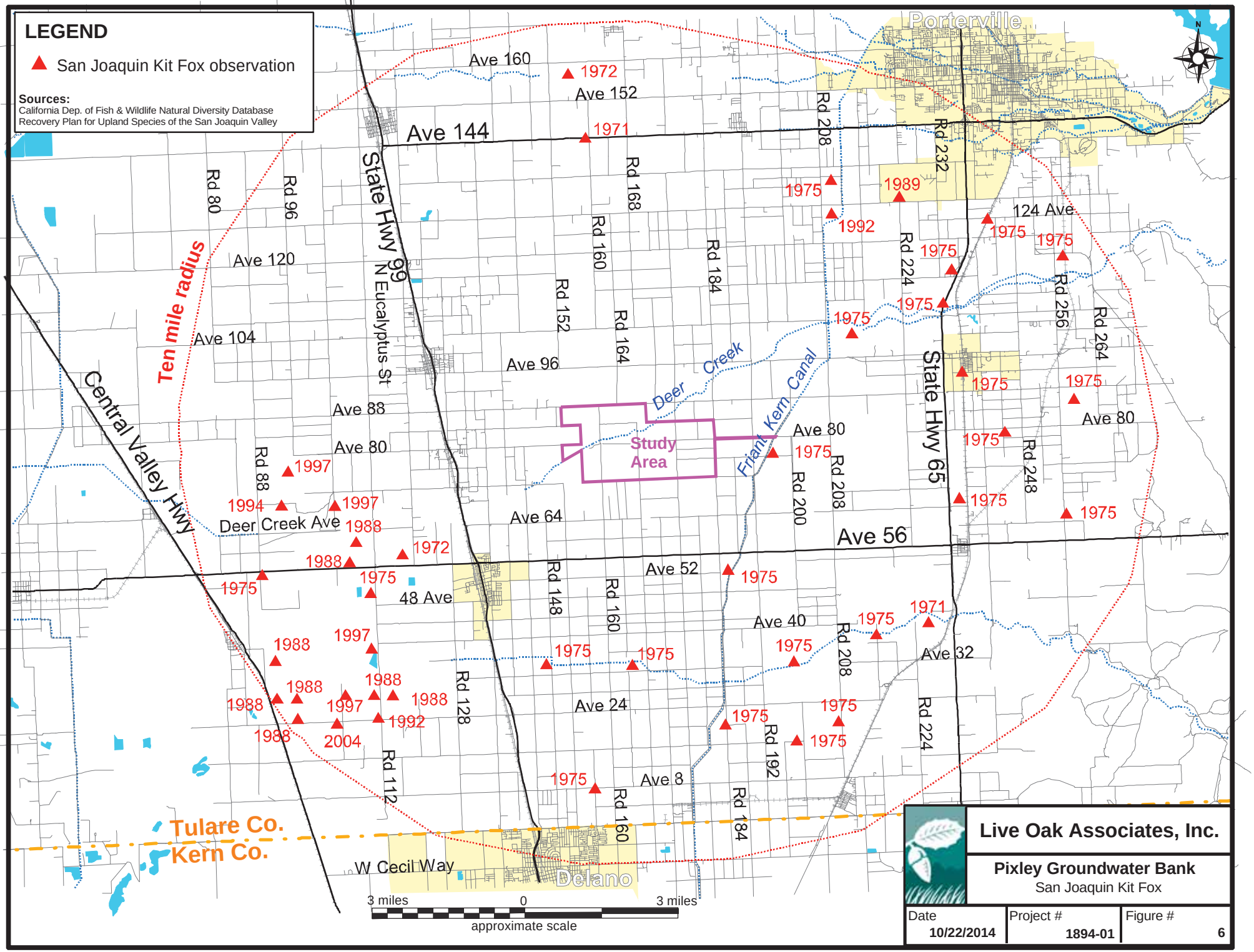

LEGEND
San Joaquin Kit Fox observation
Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
Recovery Plan for Upland Species of the San Joaquin Valley
Porterville
Ave 160
Ave 152
Ave 144
Ave 120
Ave 104
Ave 96
Ave 88
Ave 80
Ave 64
Ave 56
Ave 52
48 Ave
Ave 40
Ave 32
Ave 24
Ave 8
Rd 80
Rd 96
Rd 112
Rd 128
Rd 148
Rd 152
Rd 160
Rd 164
Rd 168
Rd 184
Rd 192
Rd 200
Rd 208
Rd 224
Rd 232
Rd 248
Rd 256
Rd 264
State Hwy 99
N Eucalyptus St
State Hwy 65
Central Valley Hwy
Ten mile radius
Deer Creek
Friant-Kern Canal
Deer Creek Ave
Study Area
W Cecil Way
Delano
Tulare Co.
Kern Co.
124 Ave
1971
1972
1975
1988
1989
1992
1994
1997
2004
3 miles
0
3 miles
approximate scale
Live Oak Associates, Inc.
Pixley Groundwater Bank
San Joaquin Kit Fox
Date
10/22/2014
Project #
1894-01
Figure #
6

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE TULARE BASIN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA.

PLANTS (adapted from CDFW 2014, CDFW 2016a, and CNPS 2014)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence on the Study Area
California Jewel Flower (*Caulanthus californicus*)	FE, CE, CNPS 1B.1	Chenopod scrub and valley and foothill grassland. Blooms February-May.	**Absent.** Habitats required by this species are absent from the study area. The nearest known occurrence is an historic sighting in, now, unsuitable habitat approx. 5.5 miles north of the study area (CDFW 2014).
Kern Mallow (*Eremalche kernensis*)	FE	Occurs in chenopod scrub and valley and foothill grassland between 230 - 4,232 feet in elevation. Blooms March – May.	**Absent.** Suitable habitat in the form of chenopod scrub and grasslands is absent from the study area and adjacent lands. Furthermore, this species has never been documented in Tulare County.
Springville Clarkia (*Clarkia springvillensis*)	FT, CE, CNPS 1B.2	Chaparral, Cismontane Woodland, Valley and Foothill Grasslands with granitic soil between 800 and 4,000 feet in elevation. Blooms May-July.	**Absent.** Habitat required by this species is absent from the study area. The study area is also below the lower elevational limit of this species range.
Striped Adobe Lily (*Fritillaria striata*)	CT CNPS 1B.1	Cismontane Woodland, Valley and Foothill Grassland with clay soils between 440 - 4,770 feet in elevation. Blooms February-April.	**Absent.** This species has a strong affinity for heavy clay adobe soils, which are not present in the study area. The study area is also below the lower elevational limit of this species range.
San Joaquin Adobe Sunburst (*Pseudobahia peirsonii*)	FT, CE, CNPS 1B.1	Occurs in grasslands of the western foothills of the Sierra Nevada in heavy clay soils of the Porterville, Cibo, Mt. Olive and Centerville series. Blooms March-April.	**Absent.** Clay soils required by this species is absent from the study area.

Other special status plants listed by CNPS

Earlimart Orache (*Atriplex cordulata var. erecticaulis*)	CNPS 1B.2	Occurs in valley and foothill grasslands between 131 and 328 feet. Blooms Aug.-Sep.	**Absent.** Although there is historic documented occurrence of this species within the vicinity of the study area (see Figure 5), habitat required by this species is absent to marginal within the study area.
Lost Hills Crownscale (*Atriplex coronata* var. *vallicola*)	CNPS 1B	Found in chenopod scrub and valley and foothill grasslands; alkaline soils; blooms April-August; elevations to 2,080 feet.	**Absent.** Although there are a few historic documented occurrences of this species within the vicinity of the study area (see Figure 5), habitat required by this species is absent to marginal within the study area.
Brittlescale (*Atriplex depressa*)	CNPS 1B.2	Occurs in relatively barren areas with alkaline clay soils in chenopod scrub, playas, valley grasslands, and vernal pools of the Central Valley.	**Absent.** Habitat required by this species is absent to marginal within the study area.
Vernal Pool Smallscale (*Atriplex persistens*)	CNPS 1B.2	Vernal pools on alkaline soils. Blooms June-October.	**Absent.** Vernal pools and alkaline soils are absent from the study area.

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE TULARE BASIN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA.

PLANTS – cont'd

Other special status plants listed by CNPS

Species	Status	Habitat	*Occurrence on the Study Area
Subtle Orache (*Atriplex subtilis*)	CNPS 1B.2	Occurs in valley and foothill grasslands of the San Joaquin Valley. Blooms August-October.	**Absent**. Although there are a few historic documented occurrences of this species within the vicinity of the study area (see Figure 5), habitat required by this species is absent to marginal within the study area.
Alkali Mariposa-Lily (*Calochortus striatus*)	CNPS 1B.2	Occurs in alkaline meadows and ephemeral washes of chaparral, chenopod scrub, Mojavean desert scrub between 295 – 5,230 feet in elevation.	**Absent.** Suitable habitat for this species in the form of alkali soils are absent from the study area.
Recurved Larkspur (*Delphinium recurvatum*)	CNPS 1B.2	Chenopod scrub, cismontane woodlands, and alkaline soils of valley and foothill grasslands. Blooms March-May.	**Unlikely.** Although several historic occurrences exist within the vicinity of the project (the nearest at the southwestern corner of the study area), the agriculture and resulting disturbed nature of the soils within the study area create unlikely habitat for this species.
Spiny-Sepaled Button Celery (*Eryngium spinosepalum*)	CNPS 1B.2	Vernal pools and wetland swales of Fresno and Tulare Counties. Blooms in April-May	**Absent.** Suitable habitats in the form of vernal pools or wetland swales were not present on the study area.

ANIMALS (adapted from CDFW 2014a and USFWS 2009)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Conservancy Fairy Shrimp (*Branchinecta conservatio*)	FE	Vernal pools of California's Central Valley.	**Absent.** Vernal pools required by this species are absent from the study area. Furthermore, this species has never been documented in Tulare County.
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)	FT	Vernal pools of California's Central Valley.	**Absent.** Vernal pools required by this species are absent from the study area.
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	FT	Mature elderberry shrubs of California's Central Valley and Sierra Foothills.	**Absent.** The newly revised range of this species by the USFWS does not include Tulare County.
Delta Smelt (*Hypomesus transpacificus*)	FT	Occurs in turbid waters of the Sacramento-San Joaquin Delta Estuary in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties.	**Absent.** The study area does not provide suitable habitat for this species and is outside of the species current known range.
California Red-Legged Frog (*Rana aurora draytonii*)	FT	Perennial rivers, creeks and stock ponds of the Coast Range and northern Sierra foothills with overhanging vegetation.	**Absent.** The study area does not provide suitable habitat for this species and is outside of its current known range.
Blunt-Nosed Leopard Lizard (*Gambelia silus*)	FE, CE, CFP	Frequents grasslands, alkali meadows and chenopod scrub of the San Joaquin Valley.	**Absent.** The study area and surrounding lands provide unsuitable habitat for this species.

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE TULARE BASIN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA.

ANIMALS – cont'd.

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence on the Study Area
Giant Garter Snake (*Thamnophis gigas*)	FT	Occurs in marshes, sloughs, drainage canals, irrigation ditches, rice fields, and adjacent uplands. Occasionally found in slow-moving creeks. Prefers locations with emergent vegetation for cover and open areas for basking.	**Absent.** The study area does not provide suitable habitat for this species and is outside of this species' current known range.
Swainson's Hawk (*Buteo swainsoni*)	CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations.	**Possible.** This species has been documented nesting in large trees and foraging in agricultural land, including alfalfa fields, within the region. Trees within the study area along the Deer Creek channel provide suitable breeding habitat and surrounding agricultural fields provide suitable foraging habitat. See Section 2.5.1 for expanded discussion.
Tipton Kangaroo Rat (*Dipodomys nitratoides nitratoides*)	FE, CE	Chenopod scrub and alkali grasslands of the Tulare Lake Basin from Fresno County in the north to Kern County in the south.	**Absent.** Habitats required by this species are extremely marginal within the study area and surrounding lands. No kangaroo rat precincts were observed on or adjacent to the study area. The nearest documented occurrences are between 3-4 miles southwest of the site (see Figure 5).
San Joaquin Kit Fox (*Vulpes macrotis mutica*)	FE, CT	Frequents desert alkali scrub and annual grasslands and may forage in adjacent agricultural habitats. Utilizes enlarged (4 to 10 inches in diameter) ground squirrel burrows as denning habitat.	**Unlikely.** The study area and adjacent lands have been highly modified by agricultural use and, as a result, provide poor foraging habitat for the kit fox. The only suitable burrow found on the site during the field surveys was located on the steep banks of a small, highly maintained tailwater irrigation pond. There have been 45 historical sightings from 1971 to 2004 within 10 miles of the study area (Figure 6, CDFW 2014). Kit foxes would be unlikely to breed or regularly forage on the site, but may use the site for dispersal movements. See Section 2.5.3 for an expanded discussion.
State Species of Special Concern			
Kern Brook Lamprey (*Entosphenus hubbsi*)	CSC	Requires perennial waters. Occurs in the Friant-Kern Canal, lower Merced, Kaweah, Kings, and San Joaquin Rivers.	**Absent.** Perennial waters required by this species are absent from the study area.
Western Spadefoot (*Scaphiopus hammondii*)	CSC	Primarily occurs in grasslands, but also occurs in valley and foothill hardwood woodlands. Requires vernal pools or other temporary wetlands for breeding.	**Absent.** Vernal pools required by this species are absent from the study area and adjacent lands.

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE TULARE BASIN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA.

ANIMALS – cont'd.

State Species of Special Concern

Species	Status	Habitat	*Occurrence on the Study Area
Coast Horned Lizard (*Phrynosoma blainvillii*)	CSC	Grasslands, scrublands, oak woodlands, etc. of central California. Common in sandy washes with scattered shrubs.	**Unlikely.** The sandy bed of Deer Creek provides only marginal habitat for this species due to periodic inundation, and it's isolation from suitable upland habitat on surrounding lands.
San Joaquin Coachwhip (*Masticophis flagellum ruddocki*)	CSC	Open, dry habitats with little or no tree cover. Found in valley grasslands and saltbush scrub in the San Joaquin Valley.	**Absent.** Habitats required by this species are absent from the study area and surrounding lands.
White-tailed Kite - nesting (*Elanus leucurus*)	CFP	Forages in open grasslands and agricultural areas throughout central California. Nests in isolated trees or small woodland patches.	**Possible.** Breeding habitat is present within mature trees along Deer Creek. Some foraging habitat is available for this species on the study area in the form of open agricultural fields.
Northern Harrier – nesting (*Circus cyaneus*)	CSC	Forages and nests in meadows, grasslands, open rangelands, and freshwater emergent wetlands.	**Possible.** The site provides suitable foraging habitat. Breeding habitat is absent for this species.
Burrowing Owl (*Athene cunicularia*)	CSC	Frequents open, dry annual or perennial grasslands, deserts, and scrublands characterized by low growing vegetation. Dependent upon burrowing mammals, most notably the California ground squirrel, for nest burrows.	**Possible.** No burrowing owl or sign of burrowing owl were observed during the site surveys. Nesting habitat in the form of ground squirrel burrows is extremely limited on the site. Suitable foraging habitat is marginal. See expanded discussion in Section 2.5.2.
Loggerhead Shrike (*Lanius ludovicianus*)	CSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. Can often be found in cropland.	**Possible.** Suitable nesting and foraging habitat occurs on the study area for this species.
Tricolored Blackbird (*Agelaius tricolor*)	CSC	Breeds colonially near fresh water, primarily emergent wetlands, with tall thickets. Forages in grassland and cropland habitats.	**Possible.** This species may occasionally forage on the study area. Suitable habitat for a breeding colony is absent.
Pallid Bat (*Antrozous pallidus*)	CSC	Roosts in rocky outcrops, cliffs, and crevices with access to open habitats for foraging. May also roost in caves, mines, hollow trees and buildings.	**Possible.** This species may forage and roost within the study area. Bridges and hollow trees in the study area provide suitable roosting habitat.
Townsend's Western Big-Eared Bat (*Corynorhinus townsendii*)	CSC	Primarily a cave-dwelling bat that may also roost in buildings, bridges, rock crevices, and hollow trees. Occurs in a variety of habitats.	**Possible.** This species may forage and roost within the study area. Bridges and hollow trees in the study area provide suitable roosting habitat.
American Badger (*Taxidea taxus*)	CSC	Found in drier open stages of most shrub, forest and herbaceous habitats with friable soils.	**Unlikely.** The Deer Creek corridor provides only marginal habitat for this species due to periodic inundation, and it's isolation from suitable upland habitat on surrounding lands.

***Explanation of Occurrence Designations and Status Codes**

Occurrence Designations

Present: Species observed on the study area at time of field surveys or during recent past.
Likely: Species not observed on the study area, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the study area, but it could occur there from time to time.
Unlikely: Species not observed on the study area, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the study area, and precluded from occurring there because habitat requirements not met.

Status Codes

Federal Listing	
FE	Federally Endangered
FT	Federally Threatened
FPE	Federally Endangered (Proposed)
FC	Federal Candidate

California Listing	
CE	California Endangered
CT	California Threatened
CR	California Rare
CFP	California Fully Protected
CSC	California Species of Special Concern

CNPS Listing	
1A	Plants Presumed Extinct in California
1B	Plants Rare, Threatened, or Endangered in California and Elsewhere

CNPS Threat Ranks	
0.1	Seriously Threatened in California
0.2	Fairly Threatened in California
0.3	Not Very Threatened in California

2.5 ENDANGERED, THREATENED, OR SPECIAL STATUS PLANT AND ANIMAL SPECIES MERITING FURTHER DISCUSSION

2.5.1 Swainson's Hawk (*Buteo swainsoni*). Federal Listing Status: None; State Listing Status: Threatened.

Ecology of the species. The Swainson's hawk is designated as a California Threatened species. The loss of agricultural lands (i.e., foraging habitat) to urban development and additional threats such as riverbank protection projects have contributed to its decline. However, this species appears to be increasing in numbers in the southern San Joaquin Valley.

Swainson's hawks are large, broad-winged, broad-tailed hawks that have a high degree of mate and territorial fidelity. They arrive at their nesting sites after a long migration from South America in March to early April. In the Central Valley, Swainson's hawks typically nest in large trees in or near riparian woodlands located adjacent to suitable foraging habitats. The young hatch sometime between late May and early June and do not leave the nest until some 6 to 8 weeks later. Other suitable nest sites include lone trees, groves of trees such as oaks, other trees in agricultural fields, and mature roadside trees. Swainson's hawks forage in large, open fields with abundant prey, including grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands.

Potential to occur onsite. No Swainson's hawks were observed during the October surveys, as would be expected since this migratory species typically leaves the Central Valley to overwinter

in South America during September. Foraging habitat is absent across much of the study area due to the presence of ruderal habitat, orchard trees, and corn fields. Some foraging habitat is available within open alfalfa fields of the study area (see Figure 4). A few mature trees suitable for Swainson's hawk nesting do occur within the study area, including the Deer Creek corridor upstream and downstream of the project stream crossing, and within a single atlas cedar along Road 184 within the in-lieu service area.

2.5.2 Burrowing Owl (*Athene cunicularia*). Federal Listing Status: None; State Listing Status: Species of Special Concern.

Ecology of the species. The burrowing owl is designated as a California Species of Special Concern. This designation was based on the species' declining population within the state over the past 40 years. The population decline is mainly due to habitat destruction resulting from development and agricultural practices.

Burrowing owls are unique in that they are the only owl that regularly lives and breeds in underground nests. In California, these birds typically occur in the Central and Imperial Valleys, primarily utilizing ground squirrel burrows, or the burrows of other animals, (e.g., badgers, coyotes, and red foxes) found in grasslands, open shrub lands, deserts, and, to a lesser extent, grazed and agricultural lands. Burrowing owls in this region exhibit strong site fidelity.

Potential to occur onsite. Foraging habitat on the study area is extremely marginal due to ongoing agricultural activities and lack of herbaceous vegetation. The Deer Creek corridor offers only marginal foraging and nesting habitat due to the disturbed nature of surrounding lands and the general high density of vegetation along the upper banks. Nonetheless, a few California ground squirrel burrows were present. An inspection of the few burrows that existed along the stretch of Deer Creek within the project footprint found no evidence of burrowing owl habitation. The CNDDB lists several occurrences of burrowing owls approximately 11 miles west of the study area in the Pixley National Wildlife Refuge (CDFW 2014).

2.5.3 San Joaquin Kit Fox (*Vulpes macrotus mutica*). Federal Listing Status: Endangered; State Listing Status: Threatened.

Ecology of the species. By the time the U.S. Fish and Wildlife Service listed it as an endangered species under the authority of the Federal Endangered Species Act on 11 March 1967, the San

Joaquin kit fox had been extirpated from much of its historic range. In 1998, the USFWS adopted a final recovery plan for the San Joaquin kit fox. On 27 June 1971, the State of California listed the kit fox as a threatened species.

The San Joaquin kit fox, the smallest North American member of the dog family (Canidae), historically occupied the dry plains of the San Joaquin Valley, from San Joaquin County to southern Kern County (Grinnell et al. 1937). Local surveys, research projects, and incidental sightings indicate that kit fox currently occupy available habitat on the San Joaquin Valley floor and in the surrounding foothills.

Kit fox prefer habitats of open or low vegetation with loose soils. In the southern and central portion of the Central Valley, kit fox are found in valley sink scrub, valley saltbrush scrub, upper Sonoran subshrub scrub, and annual grassland (USFWS 1998). Kit fox may also be found in grazed grasslands, urban settings, and in areas adjacent to tilled or fallow fields (USFWS 1998). They require underground dens to raise pups, regulate body temperature, and avoid predators and other adverse environmental conditions (Golightly and Ohmart 1984). In the central portion of their range, they usually occupy burrows (4-6" in diameter, approximately 2 ft. long) excavated by small mammals such as California ground squirrels.

Potential to occur onsite. The study area provides little to no habitat value for kit fox due to ongoing agricultural activities, sparsity of vegetation, and general lack of small mammals. Surrounding lands consisting of agricultural fields and urban areas provide similar low habitat value. Suitable denning habitat for kit foxes was not observed on or adjacent to the study area during the October 2014 field surveys. A single large burrow observed along the basin at the project footprint's northwestern corner provides extremely marginal denning habitat. This relatively large burrow was located on the steep embankment of a small irrigation tailwater pond that is regularly maintained and cleared of vegetation, and therefore provided extremely limited cover for small mammals. No evidence of use by the San Joaquin kit fox was observed. The burrow did not have a dirt berm or matted vegetation near the entrance, or prey remains in the vicinity. As the San Joaquin kit fox is not typically associated with use of riparian habitat as a movement corridor, the Deer Creek channel does not provide particularly valuable habitat for the kit fox.

Of primary interest for this assessment are kit fox records from the vicinity of the study area. According to the CNDDB there have been 45 historical sightings within ten miles of the study area (see Figure 6) (CDFW 2014). These sightings occurred north, east, south and west of the study area between 1971 and 2004. Only one of these sightings occurred in the 20th century (2004) and it was 9 miles southwest of the site. An additional five sightings were in the 90's (between 1992 and 1997), with all remaining sightings greater than 25 years old. None of these sightings occurred within the study area itself.

In summary, based on local kit fox distribution patterns and the poor quality of habitats on and adjacent to the study area, the San Joaquin kit fox is unlikely to be present on the study area. However given its presence in the region, it could conceivably pass through the study area from time to time.

2.6 JURISDICTIONAL WATERS

As will be discussed in greater detail in Section 3.2.5, the U.S. Army Corps of Engineers (USACE) has regulatory authority over certain rivers, creeks, lakes, ponds, reservoirs, wetlands, and in some cases irrigation canals ("Waters of the U.S." or "jurisdictional waters"). The extent of USACE jurisdiction is defined in the Code of Federal Regulations and has been further clarified in federal courts. Generally, Waters of the U.S. are navigable waters that cross state or national boundaries, are used in or somehow influence interstate or foreign commerce, or are impoundments or tributaries of such waters.

The Friant-Kern Canal is regulated under the Clean Water Act as a Water of the U.S. The Friant-Kern Canal is a 152-mile long aqueduct managed by the U.S. Bureau of Reclamation that conveys water to augment irrigation capacity in Fresno, Tulare and Kern Counties. Since it originates in the San Joaquin River and terminates in the Kern River, it has been claimed as a jurisdictional water by the USACE.

Deer Creek flows through the study area and currently terminates into the east bank of the Homeland Canal in the San Joaquin Valley, just east of the Tulare – Kings County border. Homeland Canal terminates at Gates-Jones Canal southwest of its juncture with Deer Creek. Based on Gibson & Skordal's communication with Zachary Simmons of the USACE, there are no precedents where the USACE has claimed jurisdiction over Deer Creek. The USACE has

determined that Poso Creek, a similar Creek to the south, is an isolated intrastate water with no apparent interstate or foreign commerce connection, and is therefore not regulated by the USACE (Gibson & Skordal 2015). Based on the USACE previous determination on Poso Creek, a creek that is very similar to Deer Creek, the jurisdictional delineation report prepared for the project (Gibson & Skordal 2015) concludes that Deer Creek is also an isolated intrastate water with no apparent interstate or foreign commerce connection (Appendix E).

Based on the findings of the jurisdictional delineation report completed for the project, irrigation ponds and ditches within the study area would not be considered jurisdictional, since these artificial ponds were created by excavating or diking dry land to collect and retain water which is used exclusively for irrigation purposes (Gibson & Skordal 2015).

2.7 NATURAL COMMUNITIES OF CONCERN

Natural communities of concern are those that are of limited distribution, distinguished by significant biological diversity, home to special status plant and animal species, of importance in maintaining water quality or sustaining flows, etc. Examples of natural communities of special concern in Tulare County include primarily various types of wetlands and riparian habitat.

Natural communities of concern on the study area are limited to the sparse narrow riparian habitat associated with the Deer Creek corridor. Riparian habitats are generally structurally diverse (i.e. multiple canopy layers are present) and provide foraging, cover, and nesting opportunities for a greater diversity of wildlife species. Riparian areas have declined dramatically in the last 150 years due to water diversion, agricultural land use, and urban development. Riparian habitats are generally subject to the jurisdiction of the CDFW.

2.8 WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors are areas where regional wildlife populations regularly and predictably move during dispersal, migration, or within-home-range movements. Movement corridors in California are typically associated with valleys, rivers, and creeks supporting riparian vegetation, and ridgelines.

Deer Creek would be considered a wildlife movement corridor. Natural habitats of the creek corridor facilitate the movements of many native species that would no longer use the adjacent highly disturbed agricultural lands. Amphibians and reptiles would disperse along the river corridor. Migratory birds would seek cover in the riparian vegetation, and some would move to breeding habitat in the Sierra via the creek corridor in order to take advantage of both cover and foraging opportunities.

2.9 CRITICAL HABITAT

Critical habitat is a designation for lands the USFWS believes are essential for species listed as threatened or endangered under the Federal Endangered Species Act. When a species is listed under the Act, the USFWS is required to designate areas determined to be essential to the conservation of the species as critical habitat. Federal agencies (such as the USBR) are required to consult with the USFWS on actions within designated critical habitat that they carry out, fund, or authorize to ensure that their actions will not destroy or adversely modify critical habitat.

Designated critical habitat is absent from the project site and immediately surrounding lands. The closest unit of critical habitat is located approximately 4.8 miles to the west of the site, and is designated for the protection of the vernal pool fairy shrimp.

3.0 IMPACTS AND MITIGATIONS

3.1 SIGNIFICANCE CRITERIA

NEPA

Federally funded projects are subject to the provisions of NEPA. The purpose of NEPA is to assess the effects of a proposed action on the human environment, assess the significance of those effects, and recommend measures that if implemented would mitigate those effects. Pursuant to NEPA, a determination shall be made by the Federal Lead Agency that states whether the Proposed Action (Project) will significantly affect the human environment; significant effects can be adverse or beneficial. "Significance" requires considerations of both context and intensity.

Context means that significance must be analyzed in terms of the affected environment in which a proposed action would occur. For the purposes of assessing effects of an action on biological resources, the relevant context is often local. The analysis requires a comparison of the action area's biological resources to the biological resources of the local area within which the action area is located. The analysis may, however, require a comparison of the action area's biological resources with the biological resources of an entire region.

Intensity refers to the severity of impact. In considering the intensity of impact to biological resources, it is necessary to address the unique qualities of wetlands and ecologically critical areas that may be affected by the action, the degree to which the action will be controversial, the degree to which the effects of the action will be uncertain, the degree to which the action will establish a precedent for future actions that may result in significant effects, and the potential for the action to result in cumulatively significant effects.

The effects of an action on some biological resources are generally considered to be "adverse" Actions that adversely affect federally listed threatened and endangered species and waters of the United States are two examples. Other effects may, however, be considered significant as well. An action that impedes the migratory movements of fish and wildlife, for example, may be considered "significant." An action that substantially reduces the areal extent of fish and

wildlife habitat may be considered "significant," especially if habitat loss occurs in areas identified by state and federal governments as ecologically sensitive or of great scenic value.

NEPA requires disclosure of feasible mitigation measures for the adverse effects of an action on the environment. Suitable measures include the following:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the project.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

This report identifies likely project impacts, identifies those that may be considered "significant" per the provisions of NEPA, and recommends mitigation measures that would avoid adverse effects to biological resources.

CEQA

Approval of general plans, area plans, and specific projects are subject to the provisions of CEQA. The purpose of CEQA is to assess the impacts of proposed projects on the environment before they are constructed. For example, site development may require the removal of some or all of its existing vegetation and animals associated with this vegetation could be destroyed or displaced. Disturbance-tolerant species adapted to humans, roads, buildings, pets, etc. may replace those species formerly occurring on a site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced while sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. These impacts may or may not be considered significant. CEQA defines a "significant effect on the environment" as a substantial, or potentially substantial, adverse change in any of the physical

conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they will:

- 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 CDFW or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS.
- 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, or coastal) through direct removal, filling, hydrological interruption, or other means.
- 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 areas. Impacts would also be significant if they reduce substantially the habitat of a fish or wildlife species, including causing a fish or wildlife population to drop below self-sustaining levels or threaten to eliminate an animal community.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065 states that a project may trigger the requirement to make "mandatory findings of significance" if: "the project has the potential to subsequently degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range on an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

CEQA requires mitigation for the adverse effects of an action on the environment. Suitable measures include the following:

(f) Avoiding the impact altogether by not taking a certain action or parts of an action.

(g) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(h) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(i) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the project.

(j) Compensating for the impact by replacing or providing substitute resources or environments.

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 General Plan Policies

In compliance with CEQA, the lead agency must consider conformance with applicable goals and policies of the General Plan of the County of Tulare. The primary biological resources goal of the Tulare County General Plan is "to preserve and protect sensitive significant habitats, enhance biodiversity, and promote healthy ecosystems throughout the County." This goal is to be accomplished through a set of policies outlined in the General Plan (Appendix F).

Relevant biological resources policies in the Tulare County General Plan include:

- protecting rare and endangered species;
- limiting development in environmentally sensitive areas;
- requiring open space buffers between development projects and significant watercourse, riparian vegetation, wetlands, and other sensitive habitats and natural communities;
- coordinating with other government land management agencies to preserve and protect biological resources;
- implementing pesticide controls to limit effects on natural resources; and

- supporting the establishment and administration of a mitigation banking program.

3.2.2 Threatened and Endangered Species

As discussed, state and federal "endangered species" legislation has provided the CDFW and the USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Permits may be required from the CDFW and/or USFWS if activities associated with a proposed project will result in the "take" of species listed as threatened or endangered under the state and/or federal endangered species acts. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Game Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are responding agencies under CEQA. The agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.2.3 Migratory Birds

The Federal Migratory Bird Treaty Act (FMBTA: 16 USC 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it actually covers almost all birds native to the United States, even those that are non-migratory. The only native birds occurring in California that are exempt from the FMBTA are the wrentit (*Chamaea fasciata*) and certain game species such as quail and grouse. The FMBTA encompasses whole birds, parts of birds, and bird nests and eggs. Additionally, California Fish and Game Code makes it unlawful to take or possess any non-game bird covered by the FMBTA (Section 3513), as well as any other native non-game bird (Section 3800).

3.2.4 Birds of Prey

Birds of prey are protected in California under provisions of the Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The

bald eagle and golden eagle are afforded additional protection under the federal Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs.

3.2.5 Wetlands and Other "Jurisdictional Waters"

The extent of the regulatory authority of the USACE over jurisdictional waters has been defined in the Code of Federal Regulations, but has also been subject to interpretation of the federal courts. Jurisdictional waters generally include:

- Waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- Interstate waters including interstate wetlands:
- Other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;
- Impoundments of waters otherwise defined as waters of the United States under the definition;
- Tributaries of waters identified in paragraphs (a)(1)-(4) (i.e. the bulleted items above).

As determined by the United States Supreme Court in its 2001 *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (SWANCC) decision, channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. Similarly, in its 2006 consolidated *Carabell/Rapanos* decision, the U.S. Supreme Court ruled that a significant nexus between a wetland and other navigable waters must exist for the wetland itself to be considered a navigable and therefore jurisdictional water.

The USACE regulates the filling or grading of jurisdictional waters under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by "ordinary high water marks" on opposing channel banks. All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide

mitigation that result in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a certification (or waiver of such certification) that the proposed activity will meet state water quality standards.

The filling of isolated wetlands, over which the USACE has disclaimed jurisdiction, is regulated by the RWQCB. It is unlawful to fill isolated wetlands without filing a Report of Waste Discharge with the RWQCB. The RWQCB is also responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the General Construction Activity Storm Water Permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code (2003). Activities that would disturb these waters are regulated by the CDFW via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question.

3.3 POTENTIALLY SIGNIFICANT PROJECT IMPACTS/MITIGATION

The project footprint includes 560 acres of recharge basins, and proposed pipelines, wells, a modified check structure, and turnout structures, for which the actual locations and total area will be defined in the final project design. With the exception of Deer Creek which will only be impacted by trenching of a pipeline crossing and modification of an existing check structure, the following subsections assume that all habitats of the project footprint will be affected by groundwater improvements, and that all impacts within the in-lieu service area will be limited to disturbed agricultural or ruderal areas. Potentially significant project impacts to biological resources and mitigations are discussed below.

3.3.1 Project Impacts to San Joaquin Kit Fox

Potential Impacts. As discussed in Section 2.5.3, there are 45 documented occurrences of the San Joaquin kit fox reported within 10 miles of the study area. A single large burrow providing marginally suitable denning habitat was observed along the steep embankment of a small, highly maintained irrigation tailwater basin at the project footprint's northwestern corner. Little cover and regular maintenance of the basin would not attract or maintain populations of small

mammals. No evidence of use by the San Joaquin kit fox was observed. The burrow did not have a dirt berm or matted vegetation near the entrance, or prey remains in the vicinity suggesting it has been used by kit fox. Given the disturbed habitats of the study area, and resulting limited prey base, the potential for kit fox to wander through the project area on their way to foraging or denning habitat is low. The proposed action would be unlikely to adversely affect San Joaquin kit fox because potential effects would be insignificant and discountable. However, given its presence in the region it could conceivably pass through the study area from time to time.

If, in the unlikely event that one or more kit foxes were present on the project site at the time of construction, then they would be at risk of construction-related mortality. As discussed, this species is listed as both federally and state endangered. In the absence of incidental take authorization by the USFWS and CDFW, construction mortality of the San Joaquin kit fox would constitute a violation of the state and federal Endangered Species Acts. Construction mortality of the San Joaquin kit fox would also constitute a significant impact of the project as defined by CEQA and an adverse effect of the project as defined by NEPA.

Mitigation. Prior to construction, the following measures adapted from the U.S. Fish and Wildlife Service 2011 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (Appendix G) will be implemented. The measures are consistent with the San Joaquin River Restoration Program (SJRRP) Conservation strategy.

> ***Mitigation Measure 3.3.1a (Pre-construction Surveys).*** A Service-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 and evaluate their use by kit foxes through use of remote monitoring techniques such as motion-triggered cameras and tracking medium. If an active kit fox den is detected within or immediately adjacent to the area of work, all construction activities associated with the project will be halted immediately. The project will be place on hold until consultation with the USFWS and CDFW is completed. Sightings of San Joaquin kit fox will also be reported to the CNDDB.
>
> ***Mitigation Measure 3.3.1b (Avoidance).*** Should an active kit fox den be detected within or immediately adjacent to the area of work, a minimum 50-foot disturbance-free buffer will be established around the den in consultation with the USFWS and CDFW, to be maintained until a qualified biologist has determined that the den is no longer

occupied. Known kit fox dens may not be destroyed until they have been vacant for a period of at least three days, as demonstrated by use of motion-triggered cameras or tracking medium, and then only after obtaining take authorization from the USFWS.

Mitigation Measure 3.3.1c (Minimization). Construction activities shall be carried out in a manner that minimizes disturbance to kit foxes. Minimization measures will include restriction of project-related vehicle traffic to established roads a daytime speed limit of 15-mph throughout the site in all project areas. Off-road traffic outside of designated Project Areas and construction at night will be prohibited. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed on in securely closed containers and removed at least once a week from the project site. No firearms or pets will be permitted on the project site. Covering of structures (e.g., pipes) and installation of escape structures will be implemented to prevent the inadvertent entrapment of kit foxes. Use of rodenticide 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.

Mitigation Measure 3.3.1d (Employee Education Program). Prior to the start of construction, the applicant will retain a Service-approved biologist to conduct one tailgate meeting to train construction staff that will be involved with the project on the San Joaquin kit fox. This training will include a description of the kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of the measures being taken to reduce impacts to the species during project construction. The training will include a hand out with all of the training information included. The project manager will use this handout to train any additional construction staff that were not in attendance at the first meeting, prior to starting work on the project.

Implementation of these measures will reduce potentially significant project impacts to the San Joaquin kit fox to a "less than significant" level under CEQA, a "not likely to adversely affect" level under the Endangered Species Act, and a less than significant level under NEPA, and ensure compliance with state and federal laws protecting this species.

3.3.2 Project-Related Mortality/Disturbance of Swainson's Hawk

Potential Impacts. Two Swainson's hawk nests have been identified between 9-10 miles west of the study area at the Pixley Wildlife Preserve (Rob Hansen, personal communication). Although no suitably sized nests were observed within the project footprint during the field surveys, trees located within the larger study area and adjacent to the study area provide potential nesting habitat for Swainson's hawks. Project-related activities occurring at or near potential nest trees could result in the abandonment of active Swainson's hawk nests or direct

mortality to these birds, should they be nesting in them at the start of construction. Construction activities conducted during the nesting season (February 1-August 31) that adversely affect the nesting success or result in mortality of Swainson's hawks would constitute a violation of state and federal laws (see Section 3.2.4) and would constitute a significant impact of the project as defined by CEQA and an adverse effect of the project as defined by NEPA.

Mitigation. Prior to the construction of the project the applicant will implement the following measure(s) as necessary.

> ***Mitigation 3.3.2a* (*Avoidance*).** In order to avoid impacts to Swainson's hawks from project construction, construction will commence between September 1st and January 31st, outside the Swainson's hawk nesting season, as feasible.
>
> ***Mitigation 3.3.2b* (*Pre-construction Surveys*).** If construction must commence between February1st and August 31st, a qualified biologist will conduct a pre-construction survey for Swainson's hawk nests on the project site and on lands within a 1/2 mile from the project site within 30 days of the onset of these activities.
>
> ***Mitigation 3.3.2c* (*Establish Buffers*).** Should any active nests be discovered in or near proposed construction zones, the biologist will establish a 0.5 mile no disturbance buffer, unless a smaller buffer can adequately protect the nest as determined by the biologist, pending the nature of disturbance and the presence or absence of disturbance barriers between the nest and construction. This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged.

Implementation of these measures will reduce potentially significant project impacts to the Swainson's hawk to a "less than significant" level under CEQA and a "not likely to adversely affect" level under NEPA, and ensure compliance with state and federal laws protecting this species.

3.3.3 Disturbance to Active Raptor and Migratory Bird Nests

Potential Impacts. In addition to the Swainson's hawk, other raptor species such as white-tailed kites, red-tailed hawks and American kestrels likely forage over the study area and could potentially nest in large trees within the study area or directly adjacent to the site. Additionally, the site provides nesting habitat for a number of migratory bird species. Even the most disturbed habitats of the study area could be used by loggerhead shrike, killdeer (*Charadrius vociferous*) or other disturbance-tolerant birds protected by the federal Migratory Bird Treaty Act and

related state laws. If birds were to nest on the project site prior to construction, project-related activities could result in the abandonment of active nests or direct mortality to these birds. If Construction activities adversely affect the nesting success of raptors or result in mortality of individual birds, this would be a violation of state and federal laws (see Sections 3.2.3 and 3.2.4) and would constitute a significant impact of the project as defined by CEQA and an adverse effect of the project as defined by NEPA.

Mitigation. In order to minimize construction disturbance to active raptor and other bird nests, the applicant will implement the following measure(s), as necessary, prior to project construction:

> ***Mitigation 3.3.3a* (*Avoidance*).** In order to avoid impacts to nesting raptors and migratory birds, applicable activities will occur, where possible, outside the nesting season, or between September 1st and January 31st.
>
> ***Mitigation 3.3.3b* (*Pre-construction Surveys*).** If applicable activities must occur during the nesting season (February 1-August 31), a qualified biologist will conduct pre-construction surveys for active raptor and migratory bird nests within 30 days of the onset of these activities. Surveys for raptors will include areas on and within 500 feet, and migratory birds on and within 250 feet of the site, where accessible. If no active nests are found within the survey area, no further mitigation is required.
>
> ***Mitigation 3.3.3c* (*Establish Buffers*).** Should any active nests be discovered in or near proposed construction zones, the biologist will identify a suitable construction-free buffer around the nest in coordination with the District, Reclamation, CDFW and/or the USFWS. This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged.

Implementation of these measures will reduce potentially significant project impacts to nesting raptors and migratory birds to a "less than significant" level under CEQA and a "not likely to adversely affect" level under NEPA, and ensure compliance with state and federal laws protecting these species.

3.3.4 Project Impacts to Burrowing Owl

Potential Impacts. The study area provides some suitable nesting/denning habitat in the form of a few scattered California ground squirrel burrows, primarily located along the banks of Deer Creek. Foraging habitat is extremely limited. These small raptors are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code. Project-related grading

activities have the potential to bury owls that may retreat to burrows ahead of heavy equipment. Mortality of individual birds would be a violation of state and federal law and would constitute a significant impact of the project as defined by CEQA and an adverse effect of the project as defined by NEPA.

Mitigation. Prior to ground disturbance activities, the following measure(s) will be implemented as necessary:

Mitigation. The Applicant will implement the following measures adapted from the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012).

> ***Mitigation Measure 3.3.4a (Take Avoidance Survey).*** A take avoidance survey for burrowing owls will be conducted by a qualified biologist between 14 and 30 days prior to the start of construction. This take avoidance survey will be conducted according to methods described in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). The survey area will include all suitable habitat on and within 200 meters of project impact areas, where accessible.
>
> ***Mitigation Measure 3.3.4b (Avoidance of Active Nests).*** If project activities are undertaken during the breeding season (February 1-August 31) and active nest burrows are identified within or near project impact areas, a 200-meter disturbance-free buffer will be established around these burrows, or alternate avoidance measures implemented in consultation with CDFW. The buffers will be enclosed with temporary fencing or flagging to prevent construction equipment and workers from entering the setback area. Buffers will remain in place for the duration of the breeding season, unless otherwise arranged with CDFW. After the breeding season (i.e. once all young have left the nest), passive relocation of any remaining owls may take place as described below.
>
> ***Mitigation Measure 3.3.4c (Avoidance or Passive Relocation of Resident Owls).*** During the non-breeding season (September 1-January 31), resident owls occupying burrows in project impact areas may either be avoided, or passively relocated to alternative habitat. If the Applicant chooses to avoid active owl burrows within the impact area during the non-breeding season, a 50-meter disturbance-free buffer will be established around these burrows, or alternate avoidance measures implemented in consultation with CDFW. The buffers will be enclosed with temporary fencing, and will remain in place until a qualified biologist determines that the burrows are no longer active. If the Applicant chooses to passively relocate owls during the non-breeding season, this activity will be conducted in accordance with a relocation plan prepared by a qualified biologist. Passive relocation may include one or more of the following elements: 1) establishing a minimum 50-foot buffer around all active burrowing owl burrows, 2) removing all suitable burrows outside the 50-foot buffer and up to 50 meters outside of the impact areas as necessary, 3) installing one-way doors on all potential owl burrows within the 50-foot buffer, 4) leaving one-way doors in place for 48 hours to

ensure owls have vacated the burrows, and 5) removing the doors and excavating the remaining burrows within the 50-foot buffer.

Implementation of these measures will reduce potentially adverse project impacts to burrowing owls to a "less than significant" level under CEQA and a no adverse effect determination under NEPA, and ensure compliance with state and federal laws protecting these species.

3.3.5 Project Impacts to Roosting Bats

Potential Impact. Trees and bridges within the study area provide potential roosting habitat for several species of bat. Development of the project could result in removal of trees potentially supporting maternal roosting bats. No modifications are proposed to the bridge over Deer Creek, which could serve as roosting habitat for both pallid bat and Townsend's big-eared bat. Impacts to trees with maternal roosts have the potential to result in the mortality of many juvenile bats and would be considered a significant impact of the project as defined by CEQA and an adverse effect of the project as defined by NEPA.

Mitigation. In order to minimize construction disturbance to maternal roosting bats in onsite trees or structures, the applicant will implement the following measures:

> ***Mitigation Measure 3.3.5a (Temporal Avoidance).*** If tree removal must occur, to avoid potential impacts to maternity bat roosts, removal of trees would occur outside of the period between April 1 and September 30, the time frame within which colony-nesting bats generally assemble, give birth, nurse their young, and ultimately disperse, as feasible.
>
> ***Mitigation Measure 3.3.5b (Preconstruction Surveys).*** If removal of trees is to occur between April 1 and September 30 (general maternity bat roost season), a qualified biologist will survey affected trees for the presence of bats within 30 days prior to these activities. The biologist will look for individuals, guano, and staining, and will listen for bat vocalizations. If necessary, the biologist will wait for nighttime emergence of bats from roost sites. If no bats are observed to be roosting or breeding, then no further action would be required, and construction could proceed.
>
> ***Mitigation Measure 3.3.5c (Minimization).*** If a non-breeding bat colony is detected during preconstruction surveys, the individuals will be humanely evicted via partial dismantlement of trees prior to full removal under the direction of a qualified biologist to ensure that no adverse impact to any bats occurs as a result of construction activities.
>
> ***Mitigation Measure 3.3.5d (Avoidance of Maternity Roosts)***. If a maternity colony is detected during preconstruction surveys, a disturbance-free buffer will be established around the colony and remain in place until a qualified biologist deems that the nursery

is no longer active. The disturbance-free buffer will range from 50 to 100 feet as determined by the biologist.

Mitigation Measure 3.3.5e (Consultation if Maternity Roosts Cannot be Avoided). If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the tree 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 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 3.3.6 (Compensation for Habitat Loss). The loss of each roost will be replaced, in consultation CDFW, and may include construction and installation of bat boxes suitable to the bat species and colony size excluded from the original roosting site(s). Roost replacement will be implemented before bats are excluded from the original roost site(s). Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost sites, the tree(s) may be removed.

The measures are consistent with the SJRRP Conservation strategy. Implementation of these measures will reduce potentially significant project impacts to roosting bats to a "less than significant" level under CEQA and NEPA.

3.3.6 Disturbance to Riparian Habitat or other Sensitive Habitats

Potential Impacts. Riparian habitat within the study area is limited to Deer Creek; no other sensitive habitats are present. A few large riparian trees are present within the project site. Temporary impacts will occur to approximately 1,400 square feet (sf) of Deer Creek from trenching the pipeline crossing, which is proposed to occur west of the modified turn-out structure and east of the Road 160 bridge over Deer Creek. The existing check structure west of the Road 160 bridge will be modified and could permanently impact up to 1,000 sf of the channel. No more than 1,000 sf of the Friant-Kern Canal will be permanently impacted from the construction of a turnout at this location. All three locations appear to lack woody vegetation. Although woody riparian vegetation within the project footprint is not anticipated to be impacted, the final project design has not been completed and the exact location has not been determined. If final project designs require removal of riparian trees, then this may constitute a significant impact of the project as defined by CEQA .

Mitigation. In order to minimize impacts to riparian habitat, the applicant will implement the following measures:

> ***Mitigation Measure 3.3.6a (Revegetation of Disturbed Areas).*** After construction, all disturbed areas within Deer Creek will be restored to the original contours. The small area of Deer Creek to be disturbed is anticipated to revegetate naturally.
>
> ***Mitigation Measure 3.3.6 (Replacement Planting).*** Should avoidance of riparian trees not be possible, the applicant will provide compensation. Replacement planting will be implemented at a ratio of 3:1 for trees between 4-24 inches in diameter at breast height (DBH), and at a ratio of 10:1 for trees greater than 24 inches in DBH. Species chosen for the plant pallet will include native riparian trees such as valley oaks, Oregon ash and Fremont's cottonwoods. Seed and cuttings will be gathered from its lands fronting the Deer Creek watershed, if possible. These trees will be planted as container plants and cuttings. All planting material will be installed in the late fall or early winter. All plantings will be monitored annually for a minimum of five years. A revegetation plan acceptable to the CDFW will be completed for the project which will detail the maintenance, monitoring, performance criteria and success rate for trees planted within the project site.

Implementation of these measures will reduce potentially significant project impacts to riparian habitat to a "less than significant" level under CEQA.

3.4 LESS THAN SIGNIFICANT PROJECT IMPACTS3.4.1 Disturbance to Waters of the United States

Potential Impacts. As discussed in Section 2.6, hydrologic features of the study area include the Friant-Kern Canal, Deer Creek, agricultural ditches, irrigation holding ponds and tail water return ponds. Based on the findings presented in the Gibson & Skordal Jurisdictional Delineation Report, the only potential water of the U.S. identified on the site is the Friant-Kern Canal (Gibson & Skordal 2015). However, the final jurisdictional status of water features is determined by the USACE upon review and verification of a wetland delineation prepared for the study area.

The project will result in approximately 1,000 sf of permanent impact to the Friant Kern Canal, a ruderal feature consisting of a concrete-lined banks and paved levee roads. Impacts to the ruderal habitats of the canal will have no measurable effect on the value or function of waters of the U.S., and will not result in a significant or adverse effect of the project.

Impacts to waters of the U.S., regardless of the size of the impact, are also subject to the permit requirements of Section 404 and 401 of the Clean Water Act. The placement of fill within any wetlands or other jurisdictional requires 1) a Clean Water Act permit from the USACE, and 2) a Water Quality Certification from the RWQCB.

Mitigation. Mitigation measures are not warranted.

3.4.2 Loss of Habitat for Special Status Plants

Potential Impacts. Thirteen special status vascular plant species are known to occur in the vicinity of the project site: California jewel-flower (*Caulanthus californicus*), San Joaquin adobe sunburst (*Pseudobahia peirsonii*), kern mallow (*Eremalche kernensis*), Springville clarkia (*Clarkia springvillensis*), striped adobe lily (*Fritillaria striata*), Lost Hills crownscale (*Aptriplex coronata* var. *vallicola*), brittlescale (*Atriplex depressa*), Earlimart orache (*Atriplex cordulata* var. *erecticaulis*), Vernal pool smallscale (*Atriplex persistens*), subtle orache (*Atriplex subtilis*), alkali mariposa lily (*Calochortus striatus*), recurved larkspur (*Delphinium recurvatum*), and spiny-sepaled button celery (*Eryngium spinosepalum*) (see Table 2). Because of the many decades of agricultural disturbance and yearly discing of the fields, habitat for these 13 plant species is absent from the study area. Therefore, the proposed project will not result in a significant or adverse effect on special status plants.

Mitigation. Mitigation measures are not warranted.

3.4.3 Loss of Habitat for Special Status Animals Absent or Unlikely to Occur on the Site

Potential Impacts. Of the 23 special status animal species potentially occurring in the region, 14 species would be absent or unlikely to occur on the site due to unsuitable habitat conditions. These include the conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), valley elderberry longhorn beetle (*Desmocerus californicus* ssp. *dimorphus*), Delta smelt (*Hypomesus transpacificus*), California red-legged frog (*Rana aurora draytonii*), blunt-nosed leopard lizard (*Gambelia silus*), giant garter snake (*Thamnophis gigas*), Kern brook lamprey (*Entosphenus hubbsi*), western spadefoot (*Scaphiopus hammondii*), western pond turtle (*Actinemys marmorata*), coast horned lizard (*Phrynosoma blainvillii*), San Joaquin coachwhip (*Masticophis flagellum* ssp. *ruddocki*), Tiptons kangaroo rat (*Dipodomys nitratoides*

nitratoides) and American badger (*Taxidea taxus*). Loss of habitat as a result of construction of the proposed action will not result in a significant or adverse effect on these species because there is little or no likelihood that they are present.

Mitigation. No loss of suitable habitat for these special status animals would occur; therefore, no mitigations are warranted.

3.4.4 Loss of Habitat for Special Status Animals that Could Breed and/or Forage on the Project Site

Species that may occasionally utilize the project site for foraging and/or breeding include the northern harrier and tricolored blackbird. The project site does not provide regionally important foraging or breeding habitat for these species, and will largely continue to provide suitable habitat for foraging and breeding opportunities after construction. The alfalfa fields of the study area, which are considered prime foraging habitat for Swainson's hawk, will remain after project development since they are located in the in-lieu fee area, and not where the recharge basins are proposed. Furthermore, vast amounts of agriculture habitat suitable for foraging and breeding will continue to be available for these species on other lands within the region following development of the groundwater bank. Therefore, future site improvements will not result in a significant or adverse effect on these species due to loss of foraging habitat.

Mitigation. Mitigations are not warranted.

3.4.5 Project Impacts to Wildlife Movement Corridors

Potential Impacts. The site consists of and is surrounded by developed or highly disturbed agricultural lands, however, Deer Creek does provide some movement opportunities for wildlife species through the study area. The trenching of the pipeline through Deer Creek, and the modification of the existing check structure will not result in any new barriers to wildlife movements. Therefore, this project will not result in a significant or adverse effect on regional wildlife movements.

Mitigation. Mitigation measures are not warranted.

3.4.6 Project Impacts to Designated Critical Habitat

Potential Impacts. As discussed, designated critical habitat is absent from the project site and immediate vicinity. Therefore, the project will not have a significant or adverse effect on critical habitat.

Mitigation. No mitigation is warranted.

3.4.7 Local Policies or Habitat Conservation Plans

Potential Impacts. The project is consistent with the goals and policies of the Tulare County General Plan. No known Habitat Conservation Plans or Natural Community Conservation Plans are in effect for the area.

Mitigation. No mitigations are warranted.

3.4.8 Degradation of Water Quality in Seasonal Drainages, Stock Ponds, and Downstream Waters

Potential Impacts. Extensive grading often leaves the soils of construction zones barren of vegetation and, therefore, vulnerable to erosion. Eroded soil is generally carried as sediment in surface runoff to be deposited in natural creek beds, canals, and adjacent wetlands. Furthermore, runoff is often polluted with grease, oil, pesticide and herbicide residues, heavy metals, etc. However, agricultural and residential lands in and around the project site are nearly level and experience regular soil disturbance that exposes barren soils. The only natural hydrologic feature found in the immediate vicinity of the project site is Deer Creek. As discussed in Section 1.1, trenching will occur at one location through Deer Creek. This channel is typically dry, and will be dry during trenching activities. Therefore, impacts to water quality from project construction are considered less than significant.

It should be noted that projects involving the grading of more than one acre of land must be in compliance with provisions of a General Construction permit (a type of NPDES permit) available from the RWQCB.

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APPENDIX A: VASCULAR PLANTS OF THE STUDY AREA

APPENDIX A: VASCULAR PLANTS OF THE PROJECT SITE

The vascular plant species listed below were observed on the project site during a site survey conducted by Live Oak Associates, Inc. on October 2 and 11, 2014. The U.S. Fish and Wildlife Service wetland indicator status of each plant has been shown following its common name.

OBL - Obligate
FACW - Facultative Wetland
FAC - Facultative
FACU - Facultative Upland
UPL - Upland
NR - No review
NA - No agreement
NI - No investigation

ANACARDIACEAE – Cashew Family		
Pistacia vera	Pistachio	UPL
APIACEAE – Carrot Family		
Conium maculatum	Poison Hemlock	FACW
ASTERACEAE – Sunflower Family		
Amaranthus albus	Tumbleweed	FACU
Amaranthus palmeri	Careless Weed	FACU
Amaranthus retroflexus	Red-root Amaranth	FACU
Ambrosia psilostachya	Western Ragweed	FACU
Artemesia douglasiana	Mugwort	FAC
Baccharis pilularis	Coyote Brush	UPL
Baccharis salicifolia	Mule Fat	FAC
Eclipta prostrata	False Daisy	FAC
Erigeron canadensis	Canada Horseweed	FACU
Gnaphalium sp.	Cudweed	-
Helianthus annuus	Common Sunflower	FACU
Helminthotheca echioides	Bristly Ox-tongue	FACU
Lactuca serriola	Prickly Lettuce	FACU
Silybum marianum	Milk Thistle	UPL
Xanthium strumarium	Rough Cocklebur	FAC
BORAGINACEAE – Borage Family		
Amsinckia sp.	Fiddleneck	UPL
Heliotropium curassavicum	Salt Heliotrope	FACU
BRASSICACEAE – Mustard Family		
Brassica nigra	Black Mustard	UPL
Raphanus sativa	Wild Radish	UPL
Sisymbrium altissimum	Tumbling Mustard	FACU
CACTACEAE - Cactus Family		
Opuntia sp.	Beavertail Cactus	UPL
CHENOPODIACEAE – Goosefoot Family		

Atriplex serenana var. *serenana*	Bracted Saltbush	FAC
Chenopodium album	Common Lambsquarters	FACU
Salsola tragus	Russian Thistle	FACU
CUPRESSACEAE – Cypress Family		
Sequoia sempervirens	Coast Redwood	UPL
CYPERACEAE –Umbrella Sedge Family		
Cyperus eragrostis	Umbrella Sedge	FACW
EUPHORBIACEAE – Spurge Family		
Euphorbia ocellata	Sandmat	UPL
FABACEAE – Legume Family		
Medicago sativa	Alfalfa	UPL
GERANIACEAE – Geranium Family		
Erodium cicutarium	Redstem Filaree	UPL
JUNCACEAE – Rush Family		
Juncus effusus pacificus	Pacific Rush	FACW
LEMNACEAE – Duckweed Family		
Lemna sp.	Duckweed	OBL
MALVACEAE – Mallow Family		
Gossypium hirsutum	Cotton	UPL
Malva nicaeensis	Bull Mallow	UPL
MYRTACEAE – Myrtle Family		
Eucalyptus globulus	Blue Gum Eucalyptus	UPL
ONAGRACEAE – Fuschia Family		
Epilobium brachycarpum	Willow Herb	UPL
PINACEAE – Pine Family		
Pinus sp.	Cultivated Pine	UPL
POACEAE – Grass Family		
Bromus diandrus	Ripgut Brome	UPL
Bromus hordeaceus	Soft Chess	FACU
Bromus madritensis ssp. *rubens*	Red Brome	FACU
Cynodon dactylon	Bermuda Grass	FAC
Digitaria sanguinalis	Hairy Crab Grass	FACU
Echinochloa crus-galli	Barnyard Grass	FACW
Hordeum murinum ssp. *leporinum*	Barnyard Barley	FACU
Leptochloa fusca ssp. *univerva*	Bearded Sprangletop	FACW
Poa annua	Annual Bluegrass	FACU
Polypogon monspelienses	Rabbit's-foot Grass	FACW
Sorghum bicolor	Cultivated Sorghum	FACU
Sorghum halepense	Johnson Grass	FACU
Zea mayz ssp. *mayz*	Cultivated Corn	UPL
POLYGONACEAE – Smartweed Family		
Persicaria maculosa	Lady's Thumb	OBL
Polygonum aviculare	Prostrate Knotweed	FACW
Rumex crispus	Curly Dock	FAC
Rumex salicifolius	Willow Dock	FACW

PORTULACACEAE – Purslane Family		
Portulaca oleracea	Common Purslane	FAC
ROSACEAE - Rose Family		
Prunus dulcis	Almond	UPL
Rubus armeniacus	Himalayan Blackberry	FACU
SALICACEAE - Willow Family		
Populus fremontii	Fremont's Cottonwood	FAC
Salix exigua	Sandbar Willow	FACW
Salix gooddingii	Goodding's Black Willow	FACW
Salix laevigata	Red Willow	FACW
SOLONACEAE - Nightshade Family		
Datura stramineum	Jimson Weed	UPL
Nicotiana glauca	Tree Tobacco	FAC
TAMARICACEAE – Tamarisk Family		
Tamarix aphylla	Tamarisk	FAC
TYPHACEAE – Cattail Family		
Typha angustifolia	Narrow-leaf Cattail	OBL
URTICACEAE – Nettle Family		
Urtica dioica	Stinging Nettle	FAC
VISCACEAE – Mistletoe Family		
Viscum album	Mistletoe	UPL
ZYGOPHYLLACEAE – Puncture Vine Family		
Tribulus terrestris	Puncture Vine	UPL

APPENDIX B: TERRESTRIAL VERTEBRATE SPECIES LIST

APPENDIX B: TERRESTRIAL VERTEBRATE SPECIES THAT POTENTIALLY OCCUR ON THE PIXLEY GROUNDWATER BANK STUDY AREA

The species listed below are those that may reasonably be expected to use the habitats of the PPSA routinely or from time to time. The list was not intended to include birds that are vagrants or occasional transients. Terrestrial vertebrate species observed in or adjacent to the study area on October 2 and 11, 2014 have been noted with an asterisk.

CLASS: AMPHIBIA (Amphibians)
ORDER: SALIENTIA (Frogs and Toads)
FAMILY: BUFONIDAE (True Toads)
Western Toad (*Bufo boreas*)
FAMILY: HYLIDAE (Treefrogs and relatives)
Pacific Chorus Frog (*Pseudacris regilla*)
FAMILY: RANIDAE (True Frogs)
Bullfrog (*Lithobates catesbeiana*)

CLASS: REPTILIA (Reptiles)
ORDER: SQUAMATA (Lizards and Snakes)
SUBORDER: SAURIA (Lizards)
FAMILY: PHRYNOSOMATIDAE
*Western Fence Lizard (*Sceloporus occidentalis*)
Side-blotched Lizard (*Uta stansburiana*)
FAMILY: TEIIDAE (Whiptails and relatives)
Western Whiptail (*Cnemidophorus tigris*)
SUBORDER: SERPENTES (Snakes)
FAMILY: COLUBRIDAE (Colubrids)
Glossy Snake (*Arizona elegans*)
Gopher Snake (*Pituophis melanoleucus*)
Common Kingsnake (*Lampropeltis getulus*)
Long-nosed Snake (*Rhinocheilus lecontei*)
Common Garter Snake (*Thamnophis sirtalis*)
FAMILY: VIPERIDAE (Vipers)
Western Rattlesnake (*Crotalus viridis*)

CLASS: AVES (Birds)
ORDER: CICONIIFORMES (Herons, Storks, Ibises and Relatives)
FAMILY: ARDEIDAE (Herons and Bitterns)
Great Blue Heron (*Ardea herodias*)
Cattle Egret (*Bubulcus ibis*)
Great Egret (*Ardea alba*)
Snowy Egret (*Egretta thula*)
FAMILY: CATHARTIDAE (American Vultures)
Turkey Vulture (*Cathartes aura*)
ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)

FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)
White-tailed Kite (*Elanus leucurus*)
Northern Harrier (*Circus cyaneus*)
*Red-tailed Hawk (*Buteo jamaicensis*)
Ferruginous Hawk (*Buteo regalis*)
Sharp-Shinned Hawk (*Accipiter striatus*)
Cooper's Hawk (*Accipiter cooperii*)
Swainson's Hawk (*Buteo swainsoni*)
FAMILY: FALCONIDAE (Caracaras and Falcons)
*American Kestrel (*Falco sparverius*)
ORDER: GRUIFORMES (Cranes, Rails and Relatives
FAMILY: RALLIDAE (Rails, Gallinules, and Coots)
American Coot (*Fulica Americana*)
ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and relatives)
FAMILY: CHARADRIIDAE (Plovers and relatives)
Killdeer (*Charadrius vociferus*)
FAMILY: RECURVIROSTRIDAE (Stilts and Avocets)
Black-necked Stilt (*Himantopus mexicanus*)
ORDER: COLUMBIFORMES (Pigeons and Doves)
FAMILY: COLUMBIDAE (Pigeons and Doves)
Rock Pigeon (*Columba livia*)
Mourning Dove (*Zenaida macroura*)
Eurasian Collared-Dove (*Streptopelia decaocto*)
ORDER: STRIGIFORMES (Owls)
FAMILY: TYTONIDAE (Barn Owls)
Barn Owl (*Tyto alba*)
FAMILY: STRIGIDAE (Typical Owls)
Burrowing Owl (*Athene cunicularia*)
Great Horned Owl (*Bubo virginianus*)
Western Screech Owl (*Otus kennicottii*)
ORDER: APODIFORMES (Swifts and Hummingbirds)
FAMILY: TROCHILIDAE (Hummingbirds)
Black-chinned Hummingbird (*Archilochus alexandri*)
Anna's Hummingbird (*Calypte anna*)
Rufous Hummingbird (*Selasphorus rufus*)
ORDER: PICIFORMES (Woodpeckers and relatives)
FAMILY: PICIDAE (Woodpecker and Wrynecks)
Northern Flicker (*Colaptes chrysoides*)
ORDER: PASSERIFORMES (Perching Birds)
FAMILY: TYRANNIDAE (Tyrant Flycatchers)
*Black Phoebe (*Sayornis nigricans*)
Say's Phoebe (*Sayornis saya*)
Western Kingbird (*Tyrannus verticalis*)
FAMILY: LANIIDAE (Shrikes)
Loggerhead Shrike (*Lanius ludovicianus*)
FAMILY: CORVIDAE (Jays, Magpies, and Crows)

*Western Scrub Jay (*Aphelocoma coerulescens*)
*American Crow (*Corvus brachyrhynchos*)
Common Raven (*Corvus corax*)
FAMILY: ALAUDIDAE (Larks)
Horned Lark (*Eremophila alpestris*)
FAMILY: HIRUNDINIDAE (Swallows)
Cliff Swallow (*Hirundo pyrrhonota*)
Barn Swallow (*Hirundo rustica*)
FAMILY: TURDIDAE
American Robin (*Turdus migratorius*)
FAMILY: MIMIDAE (Mockingbirds and Thrashers)
*Northern Mockingbird (*Mimus polyglottos*)
FAMILY: STURNIDAE (Starlings)
European Starling (*Sturnus vulgaris*)
FAMILY: MOTACILLIDAE (Wagtails and Pipits)
American Pipit (*Anthus rubescens*)
FAMILY: BOMBYCILLIDAE (Waxwings)
Cedar Waxwing (*Bombycilla cedrorum*)
FAMILY: PARULIDAE (Wood Warblers and Relatives)
*Yellow-rumped Warbler (*Dendroica coronata*)
FAMILY: EMBERIZIDAE (Sparrows and Relatives)
Savannah Sparrow (*Passerculus sandwichensis*)
*White-crowned Sparrow (*Zonotrichia leucophrys*)
FAMILY: ICTERIDAE (Blackbirds, Orioles and Allies)
Red-winged Blackbird (*Agelaius phoeniceus*)
Tricolored Black Bird (*Agelaius tricolor*)
*Western Meadowlark (*Sturnella neglecta*)
Brewer's Blackbird (*Euphagus cyanocephalus*)
Brown-headed Cowbird (*Molothrus ater*)
Bullock's Oriole (*Icterus bullockii*)
Hooded Oriole (*Icterus cucullatus*)
FAMILY: FRINGILLIDAE (Finches)
*House Finch (*Carpodacus mexicanus*)
*Lesser Goldfinch (*Carduelis psaltria*)
Lawrence's Goldfinch (*Spinus lawrencei*)
FAMILY: PASSERIDAE (Old World Sparrows)
*House Sparrow (*Passer domesticus*)

CLASS: MAMMALIA (Mammals)
ORDER: DIDELPHIMORPHIA (Marsupials)
FAMILY: DIDELPHIDAE (Opossums)
Virginia Opossum (*Didelphis virginiana*)
ORDER: CHIROPTERA (Bats)
FAMILY: PHYLLOSTOMIDAE (Leaf-nosed Bats)
Southern Long-nosed Bat (*Leptonycteris curasoae*)
FAMILY: VESPERTILIONIDAE (Evening Bats)

Yuma Myotis (*Myotis yumanensis*)
California Myotis (*Myotis californicus*)
Pale Big-eared Bat (*Corynorhinus townsendii pallescens*)
Western Pipistrelle (*Pipistrellus hesperus*)
Big Brown Bat (*Eptesicus fuscus*)

FAMILY: MOLOSSIDAE (Free-tailed Bat)

Brazilian Free-tailed Bat (*Tadarida brasiliensis*)

ORDER: LAGOMORPHA (Rabbits, Hares, and Pikas)

FAMILY: LEPORIDAE (Rabbits and Hares)

Audobon's Cottontail (*Sylvilagus audubonii*)
Black-tailed (Hare) Jackrabbit (*Lepus californicus*)

ORDER: RODENTIA (Rodents)

FAMILY: SCIURIDAE (Squirrels, Chipmunks, and Marmots)

*California Ground Squirrel (*Spermophilus beecheyi*)

FAMILY: GEOMYIDAE (Pocket Gophers)

Botta's Pocket Gopher (*Thomomys bottae*)

FAMILY: MURIDAE (Old World Rats and Mice)

Western Harvest Mouse (*Reithrodontomys megalotis*)
Deer Mouse (*Peromyscus maniculatus*)
Norway Rat (*Rattus norvegicus*)
House Mouse (*Mus musculus*)
California Vole (*Microtus californicus*)

ORDER: CARNIVORA (Carnivores)

FAMILY: CANIDAE (Foxes, Wolves, and relatives)

Coyote (*Canis latrans*)
Red Fox (*Vulpes vulpes*)

FAMILY: PROCYONIDAE (Raccoons and relatives)

Raccoon (*Procyon lotor*)

FAMILY: MEPHITIDAE (Skunks)

Striped Skunk (*Mephitis mephitis*)

FAMILY: FELIDAE (Cats)

Bobcat (*Lynx rufus*)
Feral Cat (*Felis domesticus*)

APPENDIX C: SELECTED PHOTOGRAPHS OF THE STUDY AREA

Photograph #1 (above). Almond orchard encompasses much of the project site and study area.

Photograph #2 (below). Cotton was one of the agricultural crops being grown in the project site.

Photographs #3 and #4. Ruderal areas included disturbed and often barren areas surrounded by agricultural lands.

Photograph #5 (above). Sorgum was one of the crops being grown within agricultural lands of the study area. Photograph #6 (below). Deer Creek at the Road 160 bridge crossing within the project site.

Photograph #7 (above). Another turnout is proposed adjacent to this existing turnout on Deer Creek.

Photograph #8 (below). Harris Ditch is one of the agricultural ditches of the study area.

APPENDIX D: USFWS REGIONAL LIST OF SPECIAL STATUS SPECIES

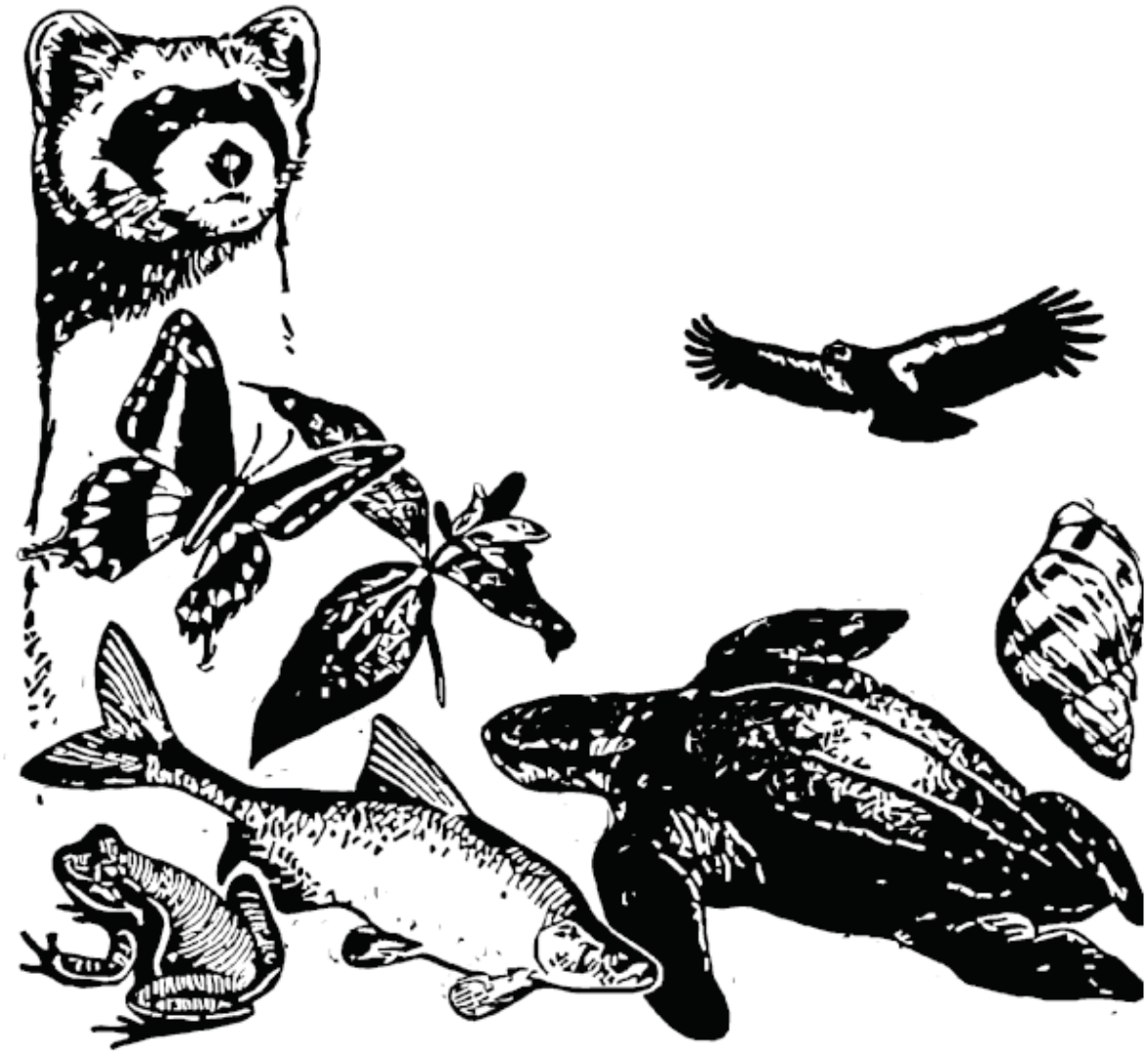
U.S. Fish & Wildlife Service

Pixley Groundwater Bank Feb 23 2016

IPaC Trust Resource Report

Generated February 23, 2016 10:41 AM MST, IPaC v2.3.2

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (http://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

US Fish & Wildlife Service

IPaC Trust Resource Report

NAME

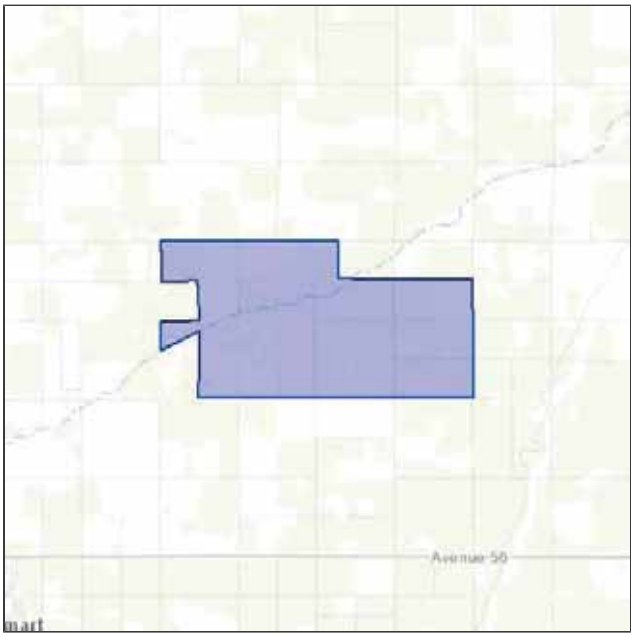
Pixley Groundwater Bank Feb 23 2016

LOCATION

Tulare County, California

IPAC LINK

http://ecos.fws.gov/ipac/project/WZDNM-5KTMJ-EDBA5-KC4WF-NSSNIU



U.S. Fish & Wildlife Contact Information

Trust resources in this location are managed by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require FWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from the Regulatory Documents section in IPaC.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Amphibians

California Red-legged Frog Rana draytonii — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=D02D

Crustaceans

Vernal Pool Fairy Shrimp Branchinecta lynchi — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=K03G

Fishes

Delta Smelt Hypomesus transpacificus — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E070

Flowering Plants

California Jewelflower Caulanthus californicus — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q2Y8

Mammals

San Joaquin Kit Fox Vulpes macrotis mutica — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A006

Tipton Kangaroo Rat Dipodomys nitratoides nitratoides — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A08S

Reptiles

Blunt-nosed Leopard Lizard Gambelia silus — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C001

Giant Garter Snake Thamnophis gigas — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C057

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Brewer's Sparrow Spizella breweri — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HQ

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Marbled Godwit Limosa fedoa — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JL

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B078

Nuttall's Woodpecker Picoides nuttallii — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HT

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Swainson's Hawk Buteo swainsoni — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070

Western Grebe aechmophorus occidentalis — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuges in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Emergent Wetland

PEMCx	1.94 acres
PEMC	1.08 acres
PEMAx	0.262 acre

Freshwater Forested/shrub Wetland

PFOAx	3.23 acres

Freshwater Pond

PUBFx	2.63 acres
PUBF	0.334 acre

Other

PUSCx 5.55 acres

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

APPENDIX E: JURISDICTIONAL DELINEATION REPORT, PIXLEY GROUNDWATER BANK. GIBSON & SKORDAL, LLC WETLAND CONSULTANTS

JURISDICTIONAL DELINEATION REPORT

PIXLEY GROUNDWATER BANK

Gibson & Skordal, LLC
WETLAND CONSULTANTS
2617 K Street, Suite 175
Sacramento, California 95816

JURISDICTIONAL DELINEATION REPORT

PIXLEY GROUNDWATER BANK

Tulare County, California

March 2015

Prepared For:

South Valley Water Banking Authority
357 East Olive Avenue
Tipton, California 93272

Prepared By:

Gibson & Skordal, LLC
WETLAND CONSULTANTS
2617 K Street, Suite 175
Sacramento, California 95816

INTRODUCTION

This report presents the results of a delineation of waters of the United States conducted within the Pixley Groundwater Bank study area.

LOCATION

The approximately 4,222-acre study area is located in Sections 12 and 13, Township 23 South, Range 25 East; Sections 7, 8, 9, 10, 11, 14, 15, 16, 17, and 18, Township 23 South, Range 26 East; MDB&M, Tulare County, California (UTM: 301,930 meters Easting/3,978,883 meters Northing). The study area is portrayed on the USGS Sausalito School, California 7.5- Minute Series Topographic Quadrangle. **Figure 1** is a vicinity map.

To access the site from Sacramento, drive south on CA-99 for approximately 227.7 miles before taking Exit 70A towards Avenue 96/Terra Bella. Merge onto Main Street and take the first right onto E. Terra Bella Avenue/County Highway J24 and continue for 1.8 miles. Turn right onto Road 140 and continue for 1 mile before turning left onto Avenue 88. Proceed on Avenue 88 for 1.5 miles; the study area is located to the south.

METHODOLOGY

This delineation was performed in accordance with the 1987 **"Corps of Engineers Wetlands Delineation Manual,"**[1] the **"Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0),"**[2] **"Final Map and Drawing Standards for the South Pacific Division Regulatory Program"** dated August 6, 2012, and Sacramento District's **"Minimum Standards for Acceptance of Preliminary Wetlands Delineations"** dated November 30, 2001. Corps' regulations (33 CFR 328) were used to determine the presence of waters of the United States other than wetlands. The **"U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook, May 30, 2007"**[3] was consulted in evaluating the jurisdictional status of the water features within the study

[1] Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station. Vicksburg, Miss.

[2] Wetlands Regulatory Assistance Program. September 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, Miss.

[3] U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook. May 30, 2007. U.S. Army Corps of Engineers & U.S. Environmental Protection Agency.

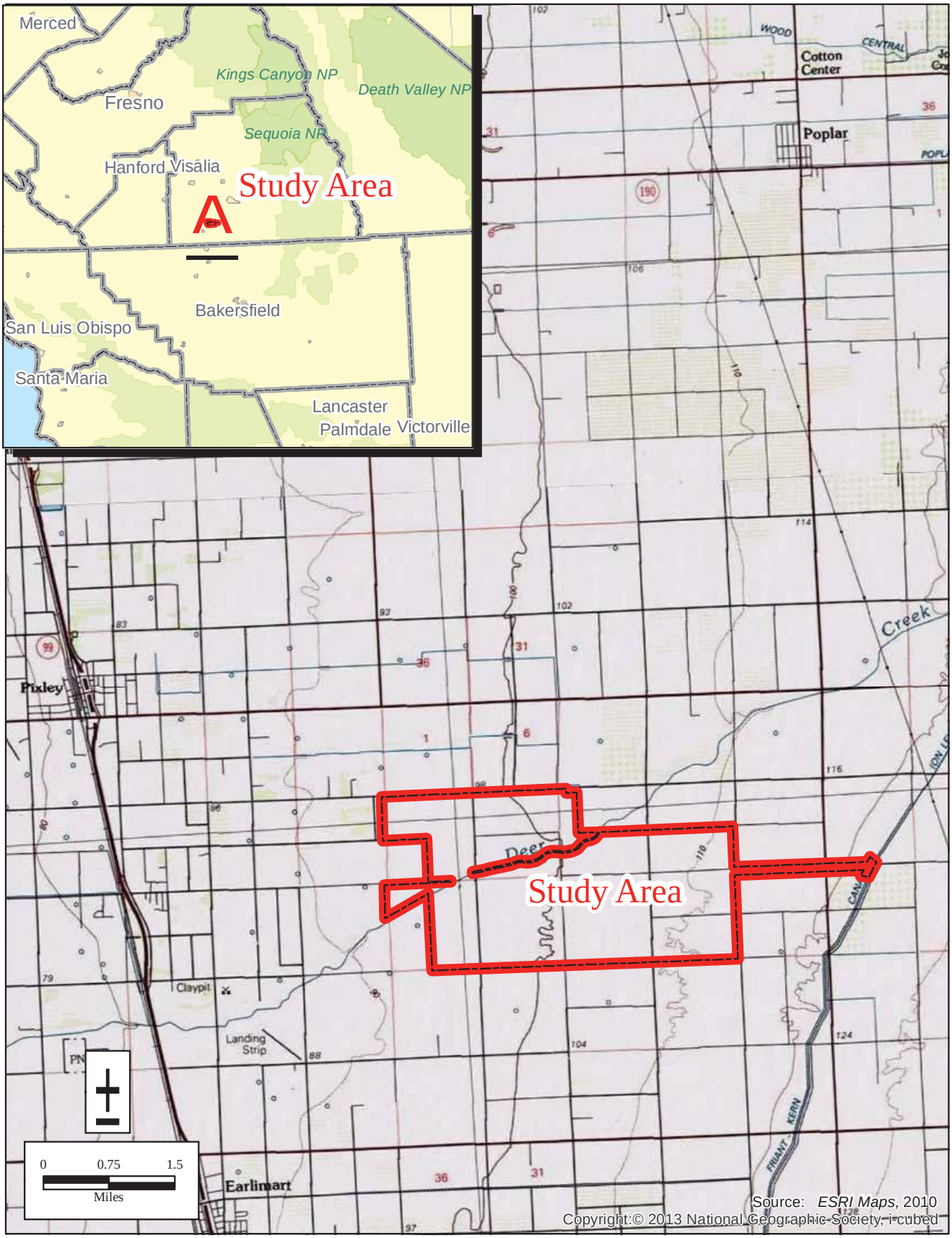


Figure 1
Vicinity Map

area. The **"The National Wetland Plant List"**[4] was used to determine the wetland indicator status of plants observed in the study area.

Field surveys were conducted on January 29, 2015, to delineate water features that are potentially regulated under Section 404 of the Federal Clean Water Act. Water features and data points were surveyed utilizing a Trimble GeoXT GPS receiver equipped with sub-meter accuracy. The delineation map was prepared in accordance with the August 6, 2012, "**Final Map and Drawing Standards for the South Pacific Division Regulatory Program.**" The GPS survey data was digitized and layered over ortho-rectified aerial photography with one meter resolution flown on June 21, 2009, for the National Agriculture Imagery Program. Detailed data on vegetation, soils, and hydrology were taken in the field. Data sheets documenting the basis for determining which areas are wetland or upland are provided in **Appendix A**. **Appendix B** is a list of plant species observed in the study area including their status as wetland indicator species. **Appendix C** contains photos of representative landscapes within the study area.

GENERAL SITE CONDITIONS AND HABITAT

Existing Field Conditions

The study area, which is located southeast of Pixley in southwestern Tulare County, is situated on level terrain at a median elevation of approximately 100 feet. The concrete-lined Friant-Kern Canal traverses the extreme eastern portion of the study area from north to south, and a small modified reach of Deer Creek is located in the western part of the site. The majority of the study area has been reclaimed for agricultural uses and is crisscrossed by a network of paved county roads. Most of the agricultural lands are irrigated and several ditches and holding ponds are scattered throughout the site.

Plant Communities

The majority of the study area supports agricultural lands. Current and recent crops include alfalfa (*Medicago sativa*), almond (*Prunus dulcis*), cotton (*Gossypium hirsutum*), corn (*Zea mays*), pistachio (*Pistacia vera*), sorghum (*Sorghum bicolor ssp. bicolor*), and grape (*Vitus vinifera*). At the time of field surveys, several of the agricultural fields were recently disked and devoid of vegetation.

[4] Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.

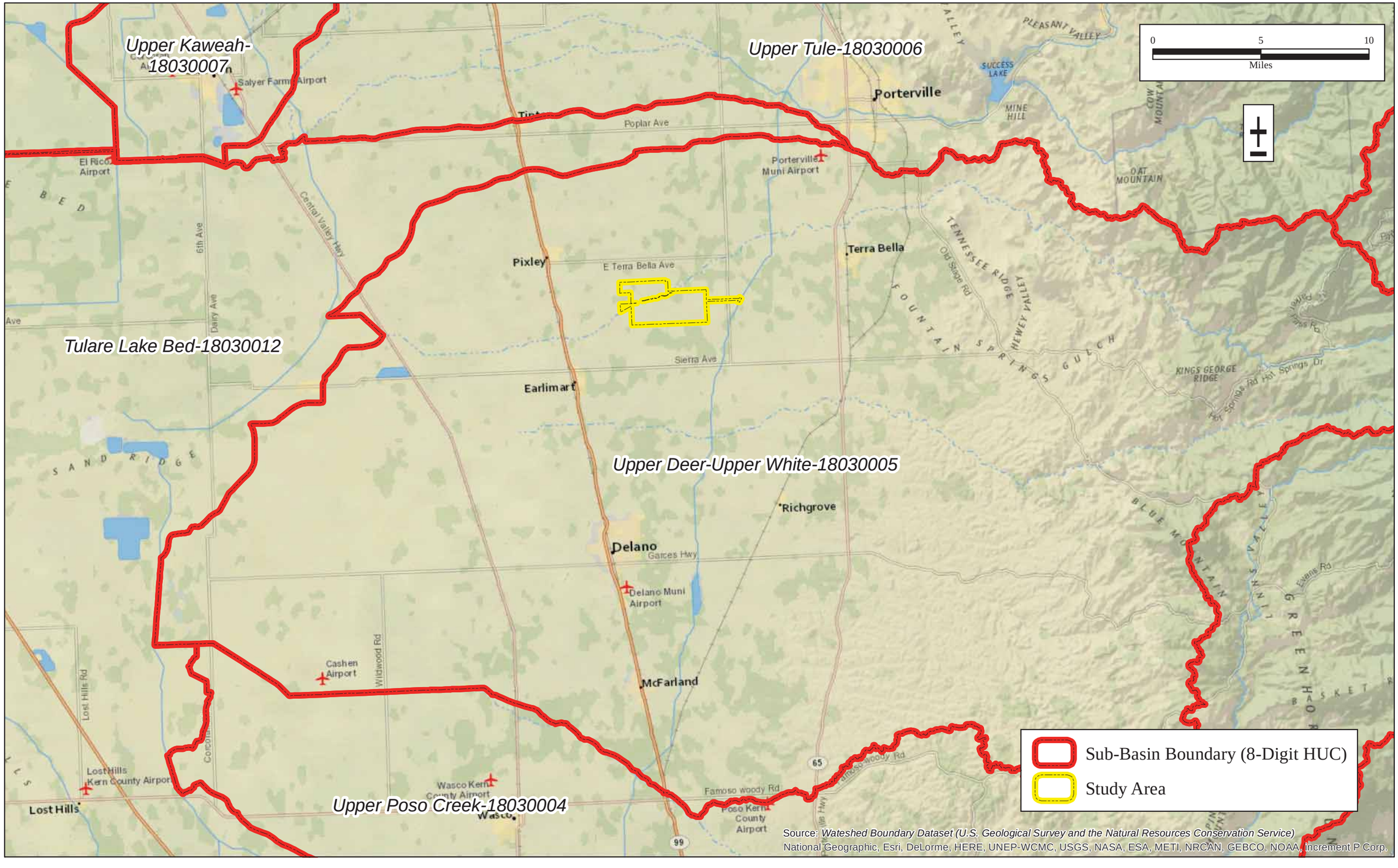


Figure 2
Watershed Exhibit

A highly disturbed reach of Deer Creek channel enters the study area from the east and exits to the west. This part of Deer Creek, which appears to have been straightened prior to 1994, is bracketed by levies and contains a diversion structure with wing walls. Most of the streambed lacked vegetation. Woody riparian species observed growing on the banks and levees include eastern cottonwood (*Populus deltoides*), narrow-leaf willow (*Salix exigua*), mule's fat (*Baccharis salicifolia*), Himalayan blackberry (*Rubus armeniacus*), and polished willow (*Salix laevigata*). The herb stratum consisted of stinging nettle (*Urtica dioica*), ripgut brome (*Bromus diandrus*), curly dock (*Rumex crispus*), Douglas' wormwood (*Artemisia douglasiana*), rough cockleburr (*Xanthium strumarium*), wall barley (*Hordeum murinum*), poison-hemlock (*Conium maculata*), and wetland and upland species.

Ruderal plant communities parallel most of the roads and uncultivated boundaries between agricultural fields. Common weedy species include Bermuda grass (*Cynodon dactylon*), Canadian horseweed (*Erigeron canadensis*), cut-leaf filaree (*Erodium cicutarium*), wall barley, Johnson grass (*Sorghum halepense*), mallow (*Malva* sp.), and other species.

Hydrology

Deer Creek flows through the study area from west to east. It contains a concrete dam that allows for the storage of irrigation water. Deer Creek flows into Homeland Canal approximately 15 miles downstream.

The Friant Kern Canal flows through the eastern edge of the study area. It originates at Millerton Dam on the San Joaquin River and terminates at the Kern River. It transports irrigation water for crops.

There are numerous irrigation holding ponds in the study area. Water is pumped into the holding ponds from water wells and then distributed into the farm fields for irrigation. Some farm fields have tail water return ponds where irrigation runoff is captured and re-circulated. These irrigation features do not receive or discharge water into any drainage or channel that could be considered a water of the United States.

The study area is set within the Upper Deer-Upper White Sub-Basin (Hydrologic Unit Code (18030005) and the Upper Deer Creek Watershed (1803000509). **Figure 2** is a sub-basin exhibit.

Soils

According to the April 1993, **Soil Survey of Tulare County, California, Western Part**," eleven soil map units, which are listed and described below, occur within the study area. **Figure 3** is a soils map.

Akers-Akers, saline-sodic, complex, 0-2% slopes (101)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have leveled and reclaimed with soil amenders. The Akers portion is very deep and well drained with moderate permeability. The saline-sodic Akers component is very deep and well drained with moderately slow permeability. Flooding is very rare for both components. Contained in this unit are the following inclusions: Calgro soils, Tujunga soils, Colpien soils, Tagus, Grangeville soils, Yettem, and Hanford soils as well as unnamed soils with surface layers of sandy loam or loam.

Biggriz-Biggriz, saline-sodic, complex, 0-2% slopes (104)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have been leveled and drained. Both components are very deep, somewhat poorly drained (and artificially drained) with moderately slow permeability. Both components are derived from alluvium from granitic rock, and both rarely flood. Contained in this unit are the following inclusions: Nord soils, Gambogy soils, Garces soils, Lethent soils, Colpien soils, Tujunga soils as well as two undescribed soils. One of which is associated with depressions that pond for more than two weeks. The other possesses a surface layer of clay loam or silt loam.

Calgro-Calgro, saline-sodic, complex, 0-2% slopes (105)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have been leveled and drained. Both components are moderately deep, moderately well drained with moderate permeability above the duripan, which is situated approximately 24 to 25 inches below the surface. Both components are derived from alluvium from granitic rock, and both very rarely flood. Contained in this unit are the following inclusions: Colpien soils, Grandeville soils, Tujunga soils, Exeter soils as well as two undescribed soils. One of which is associated with depressions that pond for more than two weeks. The other possesses a surface layer of loam.

Centerville clay, 0-2% slopes (106)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have been leveled and reclaimed with soil amenders. This unit is deep, well drained with slow permeability. It is derived from alluvium from granitic rock and very rarely floods. Contained in this unit are the following inclusions: Exeter soils and San Joaquin as well as two undescribed

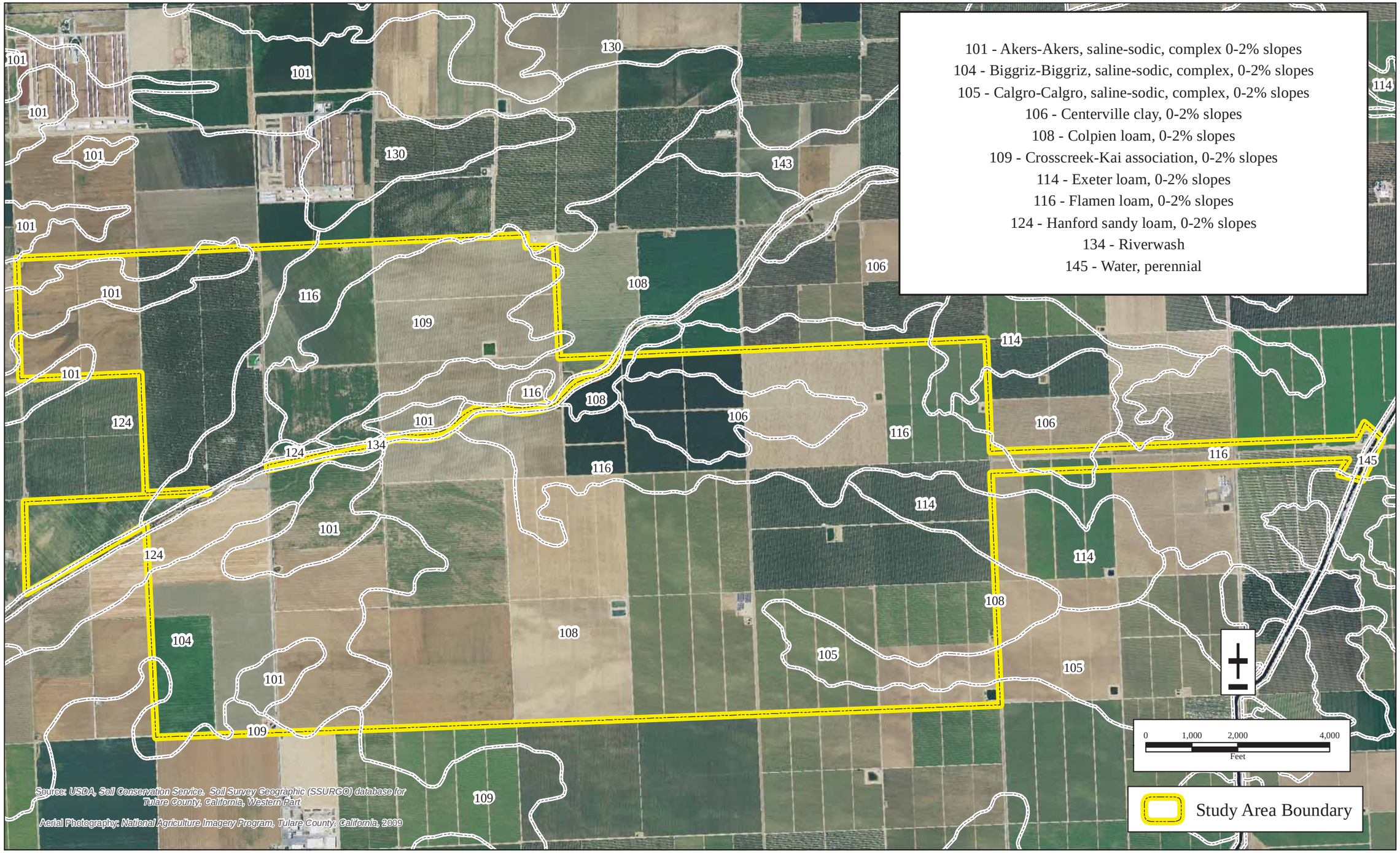


Figure 3
Soils Map

soils. One of which is associated with depressions that pond for more than two weeks, and the other possesses a surface layer of clay loam.

Colpien loam, 0-2% slopes (108)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have been leveled and reclaimed with soil amenders. This unit is very deep, moderately well drained with moderately slow permeability. It is derived from alluvium from granitic rock and rarely floods. Contained in this unit are the following inclusions: Biggriz soils, Gambogy soils, Hanford soils, Akers soils, Nord soils, and Tujunga soil as well as unnamed soils that possess a surface layer of fine sandy loam, silt loam, sandy clay loam, or clay loam.

Crosscreek-Kai association, 0-2% slopes (109)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have been ripped, leveled, and reclaimed with soil amenders. The Crosscreek soil has been formed through the alteration of Kai soils by mechanical and chemical means. The Crosscreek portion is deep and well drained with moderate permeability above the duripan, which is situated approximately 55 to 60 inches below the surface; it very rarely floods. The Kai associate is moderately deep and moderately well drained with moderate permeability in the layers above a duripan that is situated approximately 39 to 46 inches below the surface. Flooding is very rare. Contained in this unit are the following inclusions: Quonal soils, Exeter soils, Calgro soils and Hanford soils as well as two undescribed soils. One of which is associated with depressions that pond for more than two weeks. The other possesses a surface layer of sandy loam.

Exeter loam, 0-2% slopes (114)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have been leveled. This unit is moderately deep to a duripan, moderately well drained with moderately slow permeability above the duripan, which is situated approximately 28 to 46 inches below the surface; it very rarely floods. Contained in this unit are the following inclusions: Hanford soils, Quonal soils, Colpien soils, Calgro soils as well as two unnamed soils. One of which is associated with depressions that pond for more than two weeks, and the other possesses a surface layer of sandy loam.

Flamen loam, 0-2% slopes (116)
This soil, which is situated on fan remnants, is associated with irrigated croplands that have been leveled. This unit is deep to a duripan, moderately well drained with moderate permeability above the duripan, which is situated approximately 43 to 72 inches below the surface; it very rarely floods. Contained in this unit are the following inclusions: Hanford soils, San Joaquin soils, Centerville soils, Colpien soils, Calgro soils as well as two unnamed soils. One of which is

associated with depressions that pond for more than two weeks, and the other possesses a surface layer of sandy loam.

Hanford sandy loam, 0-2% slopes (124)
This soil, which is situated on flood plains and alluvial fans, is associated with irrigated croplands that have been leveled and reclaimed with soil amendments. This unit is very deep, moderately well drained with moderately rapid permeability; it very rarely floods. Contained in this unit are the following inclusions: Tujunga soils, Exeter soils, Calgro, and Yettem soils as well as unnamed soils with a surface layer of loam or fine sandy loam.

Riverwash (134)
This soil, which is situated on flood plains, is found within stream and river channels that are dry most of the year. The surface consists of sand and gravel and supports very little vegetation.

Water, perennial (145)
These areas consist of year-round surface waters

FINDINGS

Potential Wetlands and Waters of the United States

A total of 5.126 acres of water features was mapped within the study area including 3.086 acres of Deer Creek channel and 2.040 acres of the Friant-Kern Canal. **Appendix D** is a jurisdictional delineation map of the study area.

Friant-Kern Canal

The cement-lined Friant Kern Canal passes through the eastern portion of the study area. The canal originates at the San Joaquin River where water is diverted for agricultural purposes. It terminates at the Kings River. This feature lacked a plant community within the study area.

Deer Creek

Approximately 3.086 acres of Deer Creek channel were mapped within the study area. These reaches possess a bed and bank with an ordinary high water mark and the destruction of terrestrial vegetation. Most of the bed supported little to no vegetation and consisted of sand or cobble; the exception was the area at the foot of the check structure, which included riprap,

chunks of concrete, and trash. No data points were taken due to the obvious break with the surrounding uplands.

JURISDICTIONAL DETERMINATION

Irrigation Holding Ponds and Tail Water Return Ponds

In the preamble to the Corps of Engineers' regulations (33CFR Parts 320 through 330, Regulatory Programs of the Corps of Engineers; Final Rule, November 13, 1986), it states that the Corps generally does not consider certain water features as waters of the United States. Specifically mentioned are artificial ponds created by excavating or diking dry land to collect and retain water and which is used exclusively for irrigation. It is our opinion that the irrigation holding ponds and tail water return ponds in the study area meet these criteria and are not waters of the United States. Even if these features were considered waters of the United States, they would not be regulated by the Corps of Engineers because they are intrastate isolated waters with no apparent interstate or foreign commerce connection.

Friant Kern Canal

The Friant Kern Canal passes through the eastern portion of the study area. The canal originates at the San Joaquin River where water is diverted for agricultural purposes. It terminates at the Kern River. Because the canal originates at a jurisdictional water and terminates at a jurisdictional water, it would be considered a jurisdictional water regulated by the Corps of Engineers.

Deer Creek

Deer Creek flows through the study area and currently terminates into the east bank of the Homeland Canal. During storm events when Deer Creek reaches its terminus at Homeland Canal, the canal bank is breached to allow flow into Homeland Canal. Homeland Canal is an irrigation channel which flows to the south and west from its juncture with Deer Creek. It terminates at Gates – Jones Canal.

The Corps of Engineers is not aware of making any jurisdictional determinations on Deer Creek (Zackery Simmons, personal communications). They have, however, made a jurisdictional determination on Poso Creek, to the south of Deer Creek. They determined this creek is an isolated intrastate water with no apparent interstate or foreign commerce connection, and not regulated by the Corps of Engineers (Letter dated November 17, 2014, SPK-2003-00265). Poso

Creek is very similar to Deer Creek in that it terminates into Goose Lake Canal which flows to the north toward Tulare Basin.

Based on the Corps' previous determination on Poso Creek, it is our opinion that Deer Creek is also an isolated intrastate water with no apparent interstate or foreign commerce connection.

In summary, it is our opinion that the irrigation holding ponds and tail water return ponds are not waters as defined under the Clean Water Act. The Friant Kern Canal is a jurisdictional water while Deer Creek is not.

APPENDIX A

DATA SHEETS

Gibson & Skordal, LLC
WETLAND CONSULTANTS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pixley Groundwater Bank City/County: Tulare Sampling Date: January 29, 2015
Applicant/Owner: South Water Banking Authority State: CA Sampling Point: 1
Investigator(s): Jim Gibson & Matt Hirkala Section, Township, Range: Section 13, Township 23 South, Range 25 East
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1
Subregion (LRR): Mediterranean California (LRR C) Lat: 35.931625 Long: -119.230173 Datum: NAD83
Soil Map Unit Name: 124 - Hanford sandy loam, 0-2% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No	
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X

Is the Sampled Area within a Wetland? **Yes** **No** X

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 4' x 4')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **0** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **N/A** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**0**	x2 = **0**
FAC species	**0**	x3 = **0**
FACU species	**0**	x4 = **0**
UPL species	**0**	x5 = **0**
Column Totals:	**0** (A)	**0** (B)

Prevalence Index = B/A = **N/A**

Hydrophytic Vegetation Indicators:
N/A Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No**

Remarks: This area was recently disked. No vegetation was present.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR4/4	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:
No soil sample taken due to compacted gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): _____

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pixley Groundwater Bank City/County: Tulare Sampling Date: January 29, 2015
Applicant/Owner: South Water Banking Authority State: CA Sampling Point: 2
Investigator(s): Jim Gibson & Matt Hirkala Section, Township, Range: Section 12, Township 23 South, Range 25 East
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1
Subregion (LRR): Mediterranean California (LRR C) Lat: 35.945619 Long: -119.228545 Datum: NAD83
Soil Map Unit Name: 124 - Hanford sandy loam, 0-2% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No **X**	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No** **X**
Hydric Soil Present?	Yes _____ No **X**		
Wetland Hydrology Present?	Yes _____ No **X**		

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ =Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ =Total Cover		
Herb Stratum (Plot size: 4' x 4')			
1. *Immature Forage Grass*	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ =Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**0**	x2 = **0**
FAC species	**0**	x3 = **0**
FACU species	**0**	x4 = **0**
UPL species	**100**	x5 = **500**
Column Totals:	**100** (A)	**500** (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:

_____ Dominance Test is >50%

_____ Prevalence Index is ≤3.0[1]

_____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** **X**

Remarks: This area was in cotton last year; at the time of field surveys it was in upland forage grass.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR4/4	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:
No soil sample taken due to compacted gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No x Depth (inches): ____

Water Table Present? Yes ____ No x Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No x Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pixley Groundwater Bank City/County: Tulare Sampling Date: January 29, 2015
Applicant/Owner: South Water Banking Authority State: CA Sampling Point: 3
Investigator(s): Jim Gibson & Matt Hirkala Section, Township, Range: Section 7, Township 23 South, Range 26 East
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1
Subregion (LRR): Mediterranean California (LRR C) Lat: 35.938344 Long: -119.208185 Datum: NAD83
Soil Map Unit Name: 108 - Colpien loam, 0-2% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 4' x 4')			
1. *Immature Forage Grass*	40	Yes	UPL
2. *Sisymbrium altissimum*	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	60 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		
% Bare Ground in Herb Stratum 40	% Cover of Biotic Crust 0		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**0**	x2 = **0**
FAC species	**0**	x3 = **0**
FACU species	**0**	x4 = **0**
UPL species	**100**	x5 = **500**
Column Totals:	**100** (A)	**500** (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR4/4	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:
No soil sample taken due to compacted gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): ___

Water Table Present? Yes ___ No x Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pixley Groundwater Bank City/County: Tulare Sampling Date: January 29, 2015
Applicant/Owner: South Water Banking Authority State: CA Sampling Point: 4
Investigator(s): Jim Gibson & Matt Hirkala Section, Township, Range: Section 5, Township 23 South, Range 26 East
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1
Subregion (LRR): Mediterranean California (LRR C) Lat: 35.935138 Long: 119.198900 Datum: NAD83
Soil Map Unit Name: 108 - Colpien loam, 0-2% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No	
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 4' x 4')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **0** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **N/A** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**0**	x2 = **0**
FAC species	**0**	x3 = **0**
FACU species	**0**	x4 = **0**
UPL species	**0**	x5 = **0**
Column Totals:	**0** (A)	**0** (B)

Prevalence Index = B/A = **N/A**

Hydrophytic Vegetation Indicators:
N/A Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No**

Remarks: This area was recently disked. No vegetation was present.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR4/4	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:
No soil sample taken due to compacted gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): _____

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pixley Groundwater Bank City/County: Tulare Sampling Date: January 29, 2015
Applicant/Owner: South Water Banking Authority State: CA Sampling Point: 5
Investigator(s): Jim Gibson & Matt Hirkala Section, Township, Range: Section 18, Township 23 South, Range 26 East
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1
Subregion (LRR): Mediterranean California (LRR C) Lat: 35.931661 Long: -119.206065 Datum: NAD83
Soil Map Unit Name: 104 - Biggriz-Biggriz, saline-sodic, complex, 0-2% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No	
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 4' x 4')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **0** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **N/A** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**0**	x2 = **0**
FAC species	**0**	x3 = **0**
FACU species	**0**	x4 = **0**
UPL species	**0**	x5 = **0**
Column Totals:	**0** (A)	**0** (B)

Prevalence Index = B/A = **N/A**

Hydrophytic Vegetation Indicators:
N/A Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No**

Remarks: This area was recently disked. No vegetation was present.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR3/4	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:
No soil sample taken due to compacted gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): _____

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pixley Groundwater Bank City/County: Tulare Sampling Date: January 29, 2015
Applicant/Owner: South Water Banking Authority State: CA Sampling Point: 6
Investigator(s): Jim Gibson & Matt Hirkala Section, Township, Range: Section 17, Township 23 South, Range 26 East
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1
Subregion (LRR): Mediterranean California (LRR C) Lat: 35.924455 Long: -119.197093 Datum: NAD83
Soil Map Unit Name: 108 - Colpien loam, 0-2% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No	
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X
Is the Sampled Area within a Wetland?	**Yes**	**No**	**X**

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 4' x 4')			
1. *Hordeum murinum*	25	Yes	FACU
2. *Urtica dioica*	10	Yes	FAC
3. *Sisymbrium altissimum*	10	Yes	FACU
4. *Vicia* sp.	10	Yes	
5. *Lathyrus* sp.	10	Yes	
6.			
7.			
8.			
	65 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		
% Bare Ground in Herb Stratum 35	% Cover of Biotic Crust 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **N/A** (A)

Total Number of Dominant Species Across All Strata: **N/A** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **N/A** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x1 =	**0**
FACW species	**0**	x2 =	**0**
FAC species	**0**	x3 =	**0**
FACU species	**0**	x4 =	**0**
UPL species	**0**	x5 =	**0**
Column Totals:	**0** (A)		**0** (B)

Prevalence Index = B/A = **N/A**

Hydrophytic Vegetation Indicators:

N/A Dominance Test is >50%

N/A Prevalence Index is ≤3.0[1]

Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	7.5YR3/3	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:
No soil sample taken due to compacted gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): _____

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pixley Groundwater Bank City/County: Tulare Sampling Date: January 29, 2015
Applicant/Owner: South Water Banking Authority State: CA Sampling Point: 7
Investigator(s): Jim Gibson & Matt Hirkala Section, Township, Range: Section 16, Township 23 South, Range 26 East
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1
Subregion (LRR): Mediterranean California (LRR C) Lat: 35.927522 Long: -119.177631 Datum: NAD83
Soil Map Unit Name: 105 - Calgro-Calgro, saline-sodic, complex, 0-2% slopes NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No	
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X
Is the Sampled Area within a Wetland?	**Yes**	**No**	**X**

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 4' x 4')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **0** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **N/A** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**0**	x2 = **0**
FAC species	**0**	x3 = **0**
FACU species	**0**	x4 = **0**
UPL species	**0**	x5 = **0**
Column Totals:	**0** (A)	**0** (B)

Prevalence Index = B/A = **N/A**

Hydrophytic Vegetation Indicators:
N/A Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: This area was recently disked. No vegetation was present.

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR3/4	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:
No soil sample taken due to compacted gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): _____

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

PLANT LIST

Gibson & Skordal, LLC
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LIST OF PLANTS OBSERVED WITHIN
PIXLEY GOUNDWATER BANK STUDY AREA
AND THEIR STATUS AS WETLAND INDICATOR SPECIES

Scientific Name	Common Name	Status [1]&[2]
Ambrosia psilostachya	Western Ragweed	FACU
Artemesia douglasiana	Mugwort	FAC
Baccharis salicifolia	Mule's Fat	FAC
Baccharis pilularis	Coyote Brush	UPL
Bromus diandrus *(Bromus rigidus)*	Rip-gut Brome	UPL
Brassica nigra	Black Mustard	UPL
Bromus hordeaceus	Soft Chess	FACU
Bromus madritensis	Red Brome	UPL
Cynodon dactylon	Bermuda Grass	FACU
Conium maculatum	Poison Hemlock	FCW
Cyperus eragrostis	Umbrella Sedge	FACW
Digitaria sanguinalis	Hairy Crab Grass	FACU
Echinochloa crus-galli	Barnyard Grass	FACW
Eucalyptus globulus	Blue Gum Eucalyptus	UPL
Epilobium brachycarpum	Willow Herb	UPL
Erigeron canadensis	Canada Horseweed	FACU
Erodium cicutarium	Redstem Filaree	UPL
Helianthus annuus	Common Sunflower	FACU
Helminthotheca echioides *(Picris echioides)*	Akan Asante	FACU
Hordeum murinum (Hordeum leporinum)	Wall Barley	FACU
Juncus effusus	Lamp Rush	FACW
Leptochloa fusca ssp. *univerva*	Bearded Sprangletop	FACW
Poa annua	Annual Bluegrass	FACU
Polypogon monspelienses	Rabbit's-foot Grass	FACW
Portulaca oleracea	Common Purslane	FAC
Persicaria maculosa	Lady's Thumb	OBL
Polygonum aviculare	Prostrate Knotweed	FACW
Rumex crispus	Curly Dock	FAC
Sorghum bicolor	Cultivated Sorghum	FACU
Sorghum halepense	Johnson Grass	FACU
Lactuca serriola	Prickly Lettuce	FACU
Malva sp.	Mallow	--

[1] Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.

[2] OBL = obligate; FACW = facultative wetland; FAC = facultative; FACU = facultative upland; UPL = upland

Scientific Name	**Common Name**	**Status** [1]&[2]
Opuntia sp.	Beavertail Cactus	UPL
Pistacia vera	Pistachio	UPL
Prunus dulcis	Almond	UPL
Populus deltoides	Eastern Cottonwood	FAC
Raphanus sativa	Wild Radish	UPL
Rubus armeniacus *(Rubus procerus)*	Himalayan blackberry	FACU
Rumex crispus	Curly Dock	FAC
Salix exigua *(Salix hindsiana)*	Narrow-leaf Willow	FACW
Salix laevigata	Polished Willow	FACW
Salsola tragus	Russian Thistle	FACU
Silybum marianum	Milk Thistle	UPL
Sisymbrium altissimum	Tumbling Mustard	FACU
Trifolium sp.	Clover	--
Typha angustifolia	Narrow-leaf Cat-tail	OBL
Urtica dioica	Stinging Nettle	FAC
Xanthium strumarium	Rough Cockleburr	FAC

[1] Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.

[2] OBL = obligate; FACW = facultative wetland; FAC = facultative; FACU = facultative upland; UPL = upland

APPENDIX C

PHOTOGRAPHS

Gibson & Skordal, LLC
WETLAND CONSULTANTS

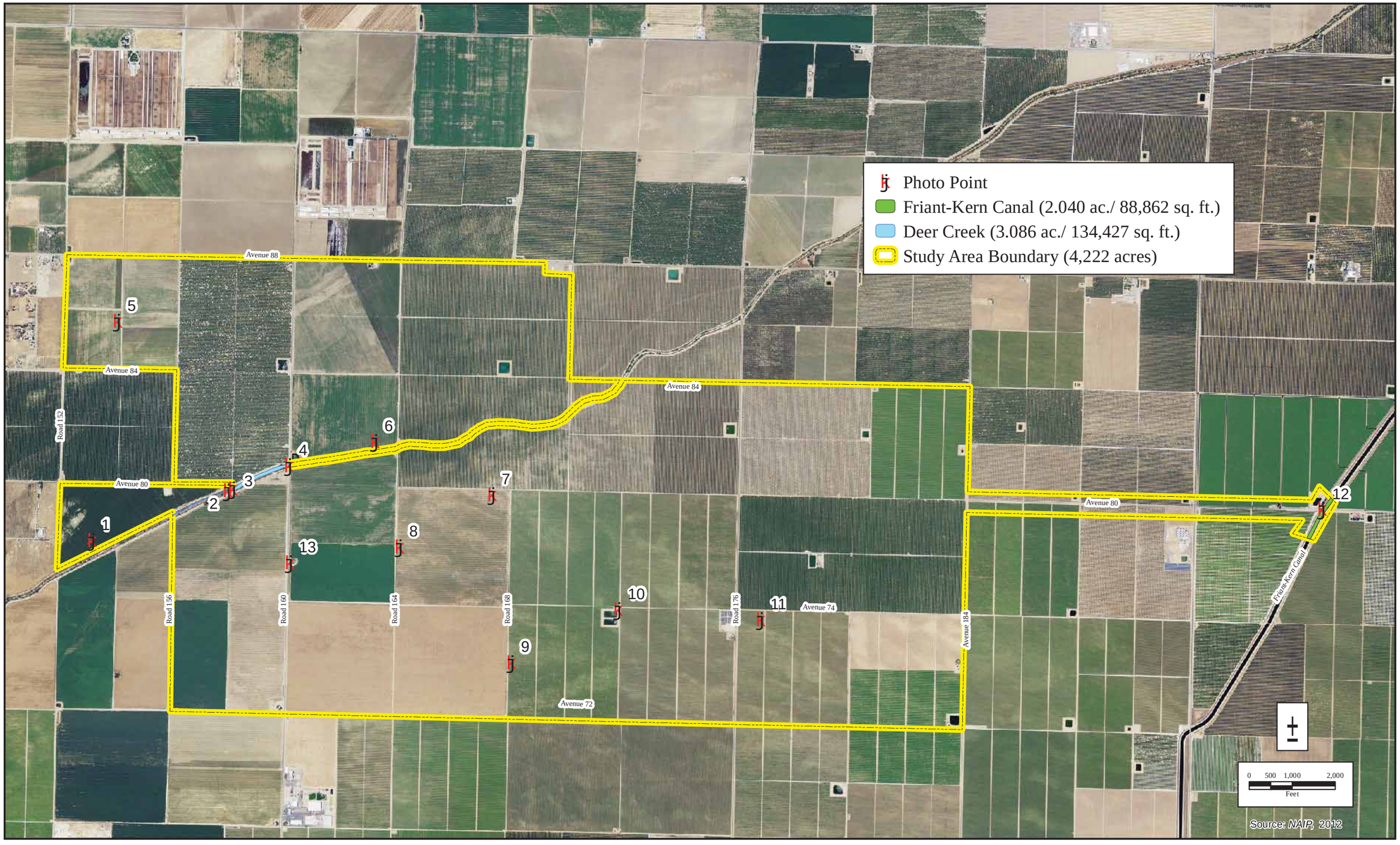
Photo Point
Friant-Kern Canal (2.040 ac./ 88,862 sq. ft.)
Deer Creek (3.086 ac./ 134,427 sq. ft.)
Study Area Boundary (4,222 acres)
Avenue 88
Avenue 84
Avenue 80
Avenue 74
Avenue 72
Avenue 184
Road 152
Road 156
Road 160
Road 164
Road 168
Road 176
Friant-Kern Canal
1
2
3
4
5
6
7
8
9
10
11
12
13
0 500 1,000 2,000
Feet
Source: NAIP, 2012

Photo Point 1 – Data Point 1 Facing North

Photo Point 2 – Facing Up (Northeast) Deer Creek

Photo Point 2 – Facing Down (Southwest) Deer Creek

Photo Point 3 – Facing Up (Northeast) Deer Creek

Photo Point 3 – Facing Down (Southwest) Deer Creek

Photo Point 4 – Facing Down (Southwest) Deer Creek

Photo Point 5 – Data Point 2 Facing North

Photo Point 6 – Data Point 3 Facing North

Photo Point 7 – Data Point 4 Facing North

Photo Point 8 – Data Point 5 Facing North

Photo Point 9 – Data Point 6 Facing East

Photo Point 10 – Irrigation Holding Pond Facing East

Photo Point 10 – Irrigation Holding Pond Facing South

Photo Point 11 – Data Point 7 Facing East

Photo Point 12 – Friant-Kern Canal Facing Upstream

Photo Point 12 – Friant-Kern Canal Facing North

Photo Point 13 –Tailwater Return Ditch Facing South

Photo Point 13 –Tailwater Return Pond Facing Northeast

APPENDIX D

JURISDICTIONAL DELINEATION MAP

Gibson & Skordal, LLC
WETLAND CONSULTANTS

Jurisdictional Delineation
Pixley Groundwater Bank

Tulare County, California

j Data Point
? Reference Point (NAD83, decimal degrees)
Friant-Kern Canal (2.040 ac./ 88,862 sq. ft.)
Deer Creek (3.086 ac./ 134,427 sq. ft.)
Study Area Boundary (4,222 acres)

INSET 1

Deer Creek Reach 2 = 102,997 sq. ft.
Deer Creek Reach 1 = 31,430 sq. ft.
Avenue 80
Road 160
?
1 inch = 400 feet
Aerial Base: NAIP
Aerial Base Flown: June 21, 2009
Feet 0 400 800

Avenue 88
Avenue 84
Avenue 80
Avenue 72
Avenue 74
Avenue 184
Avenue 192
Road 152
Road 156
Road 160
Road 164
Road 168
Road 176
SEE INSET 1
SEE INSET 2
Friant-Kern Canal
1
2
3
4
5
6
7
?

INSET 2

Avenue 80
Friant-Kern Canal
35.934114 -119.135007
?
Feet 0 400 800
1 inch = 200 feet
Aerial Base: NAIP
Aerial Base Flown: June 21, 2009

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Gibson & Skordal, LLC
WETLAND CONSULTANTS

Prepared For:
South Valley Water Banking Authority
357 East Olive Avenue
Tipton, California 93272

Aerial Base: National Agriculture Imagery Program, 2009
Aerial Base Flown: June 21, 2009
Map Prepared by: M. Hirkala
Date Map Prepared: February 2015

0 500 1,000 2,000
Feet

APPENDIX F. TULARE COUNTY GENERAL PLAN POLICIES PERTAINING TO BIOLOGICAL RESOURCES

the assurance of rail transport for commodities such as grain, row crops, and fruit, a number of farming colonies soon appeared throughout the region.

The colonies grew to become cities such as Tulare, Visalia, Porterville, and Hanford. Visalia, the County seat, became the service, processing, and distribution center for the growing number of farms, dairies, and cattle ranches. By 1900, Tulare County boasted a population of about 18,000. New transportation links such as SR 99 (completed during the 1950s), affordable housing, light industry, and agricultural commerce brought steady growth to the valley. The U.S. Census Bureau estimated the 2003 Tulare County population to be 390,791.

8.1 Biological Resources

ERM-1 To preserve and protect sensitive significant habitats, enhance biodiversity, and promote healthy ecosystems throughout the County. [*New Goal]*

ERM-1.1 Protection of Rare and Endangered Species
The County shall ensure the protection of environmentally sensitive wildlife and plant life, including those species designated as rare, threatened, and/or endangered by State and/or federal government, through compatible land use development. [*New Policy based on ERME IV-C; Biological Resources; Issue 12, and ERME; Pg 32*]

ERM-1.2 Development in Environmentally Sensitive Areas
The County shall limit or modify proposed development within areas that contain sensitive habitat for special status species and direct development into less significant habitat areas. Development in natural habitats shall be controlled so as to minimize erosion and maximize beneficial vegetative growth. [*New Policy based on EMRE; Water; Issue 3; Recommendation 3, ERME; Pg 28]*

ERM-1.3 Encourage Cluster Development
When reviewing development proposals, the County shall encourage cluster development in areas with moderate to high potential for sensitive habitat. [*New Policy*]

ERM-1.4 Protect Riparian Areas
The County shall protect riparian areas through habitat preservation, designation as open space or recreational land uses, bank stabilization, and development controls. [*New Policy*]

ERM-1.5 Riparian Management Plans and Mining Reclamation Plans
The County shall require mining reclamation plans and other management plans include measures to protect, maintain and restore riparian resources and habitats. [*New Policy*]

ERM-1.6 Management of Wetlands
The County shall support the preservation and management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats. [*New Policy*]

ERM-1.7 Planting of Native Vegetation
The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained. [*New Policy*]

ERM-1.8 Open Space Buffers
The County shall require buffer areas between development projects and significant watercourses, riparian vegetation, wetlands, and other sensitive habitats and natural communities. These buffers should be sufficient to assure the continued existence of the waterways and riparian habitat in their natural state. [*New Policy based on EMRE policies*]

ERM-1.9 Coordination of Management on Adjacent Lands
The County shall work with other government land management agencies (such as the Bureau of Land Management, US Forest Service, National Park Service) to preserve and protect biological resources while maintaining the ability to utilize and enjoy the natural resources in the County. [*New Policy*]

ERM-1.10 Appropriate Access for Recreation
The County shall encourage appropriate access to resource-managed lands. [*New Policy*]

ERM-1.11 Hunting and Fishing
The County shall provide opportunities for hunting and fishing activities within the County pursuant to appropriate regulations of the California Fish & Game Code. [*New Policy*]

ERM-1.12 Management of Oak Woodland Communities
The County shall support the conservation and management of oak woodland communities and their habitats. [*New Policy*]

ERM-1.13 Pesticides
The Tulare County Agricultural Commissioner/Sealer will cooperate with State and federal agencies in evaluating the side effects of new materials and techniques in pesticide controls to limit effects on natural resources. *[ERME IV-C; Pesticides; Recommandation 1] [ERME; Pg 131, Modified*]

ERM-1.14, Mitigation and Conservation Banking Program
The County shall support the establishment and administration of a mitigation banking program, including working cooperatively with TCAG, federal, State, not-for-profit and other agencies and groups to evaluate and identify appropriate lands for protection and recovery of threatened and endangered species impacted during the land development process. [*New Policy*]

8.2 Mineral Resources - Surface Mining

ERM-2	To conserve protect and encourage the development of areas containing mineral deposits while considering values relating to water resources, air quality, agriculture, traffic, biotic, recreation, aesthetic enjoyment, and other public interest values. [*New Goal based on MRPAC June 28, 2006*]

ERM-2.1 Conserve Mineral Deposits
Emphasize the conservation of identified and/or potential mineral deposits, recognizing the need for identifying, permitting, and maintaining a 50 year supply of locally available PCC grade aggregate. [*MRPAC June 28, 2006*]

ERM-2.2 Recognize Mineral Deposits
Recognize as a part of the General Plan those areas which have identified and/or potential mineral deposits. [*MRPAC June 28, 2006*]

ERM-2.3 Future Resource Development
Provide for the conservation of identified and/or potential mineral deposits within Tulare County as areas for future resource development. Recognize that mineral deposits are significantly limited within Tulare County and that they play an important role in support of the economy of the County. [*MRPAC June 28, 2006*]

ERM-2.4 Identify New Resources
Encourage exploration, evaluation, identification, and development of previously unrecognized but potentially significant hard rock resources for production of crushed stone aggregate. [*MRPAC June 28, 2006*]

ERM-2.5 Resources Development
The County will promote the responsible development of identified and/or potential mineral deposits. [*MRPAC June 28, 2006*]

ERM-2.6 Streamline Process
Create a streamlined and timely permitting process for the mining industry, which will help encourage long-range planning and the reasonable amortization of investments. [*MRPAC June 28, 2006*]

ERM-2.8 Minimize Adverse Impacts
Minimize the adverse effects on environmental features such as water quality and quantity, air quality, flood plains, geophysical characteristics, biotic, archaeological and aesthetic factors. [*MRPAC June 28, 2006*]

ERM-2.9 Minimize Hazards and Nuisances
Minimize the hazards and nuisances to persons and properties in the area during extraction, processing and reclamation operations. [*MRPAC June 28, 2006*]

ERM-2.10 Compatibility
Develop mineral deposits in a manner compatible with surrounding land uses. [*MRPAC June 28, 2006*]

ERM-2.11 Incompatible Development
Proposed incompatible land uses shall not be on lands containing, or adjacent to identified mineral deposits, or along key access roads, unless adequate mitigation measures are adopted or a statement of overriding considerations stating public benefits and overriding reasons for permitting the proposed use are adopted. [*MRPAC June 28, 2006*]

ERM-2.12 Conditions of Approval
Procedures shall be established to ensure compliance with conditions of approval on all active and idle mines. [*MRPAC June 28, 2006*]

ERM-2.13 Approved Limits
Procedures shall be established to ensure that vested interest mining operations remain within their approved area and/or production limits. [*MRPAC June 28, 2006*]

ERM-2.14 SMARA Requirements
All surface mines, unless otherwise exempted, shall be subject to reclamation plans that meet SMARA requirements. Reclamation procedures shall restore the site for future beneficial use of the land. Mine reclamation costs shall be borne by the mine operator, and guaranteed by financial assurances set aside for restoration procedures. [*MRPAC June 28, 2006*]

8.3 Mineral Resources

ERM-3 To protect the current and future extraction of mineral resources that are important to the County's economy while minimizing impacts of this use on the public and the environment. [*ERME IV-B; Land; Issue 8*] [ERME; Pg 30, *Modified*]

ERM-3.1 Environmental Contamination
All mining operations shall be required to take precautions to avoid contamination from wastes or incidents related to the storage and disposal of hazardous materials, or general operating activity at the site. [*New Policy*]

ERM-3.2 Limited In-City Mining
Within UDBs, new commercial mining operations should be limited due to environmental and compatibility concerns. [*New Policy*]

ERM-3.3 Small-Scale Oil and Gas Extraction
The County shall permit by special use permit small-scale oil and gas extraction activities and facilities that can be demonstrated to not have a significant adverse effect on surrounding or adjacent land and are within an established oil and gas field outside of a UDB. [*New Policy*]

ERM-3.4 Oil and Gas Extraction
Facilities related to oil and gas extraction and processing may be allowed in identified oil and gas fields subject to a special use permit. The extraction shall demonstrate that it will be compatible with surrounding land uses and land use designations. [*New Policy*]

ERM-3.5 Reclamation of Oil and Gas Sites
The County shall require the timely reclamation of oil and gas development sites upon termination of such activities to facilitate the conversion of the land to its primary land use as designated by the General Plan. Reclamation costs shall be born by the mine operator, and guaranteed by financial assurances set aside for restoration procedures. [*New Policy, MRPAC Goals, Policies, Implementation Measures, and Development Standards, Goal F and associated policies*]

8.4 Energy Resources

ERM-4 To encourage energy conservation in new and existing developments throughout the County. [*New Goal*]

ERM-4.1 Energy Conservation and Efficiency Measures
The County shall encourage the use of solar energy, solar hot water panels, and other energy conservation and efficiency features in new

APPENDIX G: USFWS STANDARDIZED RECOMMENDATIONS FOR PROTECTION OF THE SAN JOAQUIN KIT FOX PRIOR TO OR DURING GROUND DISTURBANCE

U.S. FISH AND WILDLIFE SERVICE STANDARDIZED RECOMMENDATIONS FOR PROTECTION OF THE ENDANGERED SAN JOAQUIN KIT FOX PRIOR TO OR DURING GROUND DISTURBANCE

Prepared by the Sacramento Fish and Wildlife Office
January 2011

INTRODUCTION

The following document includes many of the San Joaquin kit fox (*Vulpes macrotis mutica*) protection measures typically recommended by the U. S. Fish and Wildlife Service (Service), prior to and during ground disturbance activities. **However, incorporating relevant sections of these guidelines into the proposed project is not the only action required under the Endangered Species Act of 1973, as amended (Act) and does not preclude the need for section 7 consultation or a section 10 incidental take permit for the proposed project.** Project applicants should contact the Service in Sacramento to determine the full range of requirements that apply to your project; the address and telephone number are given at the end of this document. Implementation of the measures presented in this document may be necessary to avoid violating the provisions of the Act, including the prohibition against "take" (defined as killing, harming, or harassing a listed species, including actions that damage or destroy its habitat). These protection measures may also be required under the terms of a biological opinion pursuant to section 7 of the Act resulting in incidental take authorization (authorization), or an incidental take permit (permit) pursuant to section 10 of the Act. The specific measures implemented to protect kit fox for any given project shall be determined by the Service based upon the applicant's consultation with the Service.

The purpose of this document is to make information on kit fox protection strategies readily available and to help standardize the methods and definitions currently employed to achieve kit fox protection. The measures outlined in this document are subject to modification or revision at the discretion of the Service.

IS A PERMIT NECESSARY?

Certain acts need a permit from the Service which includes destruction of any known (occupied or unoccupied) or natal/pupping kit fox dens. Determination of the presence or absence of kit foxes and /or their dens should be made during the environmental review process. All surveys and monitoring described in this document must be conducted by a qualified biologist and these activities do not require a permit. A qualified biologist (biologist) means any person who has completed at least four years of university training in wildlife biology or a related science and/or has demonstrated field experience in the identification and life history of the San Joaquin kit fox. In addition, the biologist(s) must be able to identify coyote, red fox,

gray fox, and kit fox tracks, and to have seen a kit fox in the wild, at a zoo, or as a museum mount. Resumes of biologists should be submitted to the Service for review and approval prior to an6y survey or monitoring work occurring.

SMALL PROJECTS

Small projects are considered to be those projects with small foot prints, of approximately one acre or less, such as an individual in-fill oil well, communication tower, or bridge repairs. These projects must stand alone and not be part of, or in any way connected to larger projects (i.e., bridge repair or improvement to serve a future urban development). The Service recommends that on these small projects, the biologist survey the proposed project boundary and a 200-foot area outside of the project footprint to identify habitat features and utilize this information as guidance to situate the project to minimize or avoid impacts. If habitat features cannot be completely avoided, then surveys should be conducted and the Service should be contacted for technical assistance to determine the extent of possible take.

Preconstruction/preactivity surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to impact the San Joaquin kit fox. Kit foxes change dens four or five times during the summer months, and change natal dens one or two times per month (Morrell 1972). Surveys should identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped (see Survey Protocol). Written results of preconstruction/preactivity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities.

If a natal/pupping den is discovered within the project area or within 200-feet of the project boundary, the Service shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the preconstruction/preactivity survey reveals an active natal pupping or new information, the project applicant should contact the Service immediately to obtain the necessary take authorization/permit.

If the take authorization/permit has already been issued, then the biologist may proceed with den destruction within the project boundary, except natal/pupping den which may not be destroyed while occupied. A take authorization/permit is required to destroy these dens even after they are vacated. Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint (conversely, the project boundary can be demarcated, see den destruction section).

OTHER PROJECTS

It is likely that all other projects occurring within kit fox habitat will require a take authorization/permit from the Service. This determination would be made by the Service during the early evaluation process (see Survey Protocol). These other projects would include, but are not limited to: Linear projects; projects with large footprints such as urban development; and projects which in themselves may be small but have far reaching impacts (i.e., water storage or conveyance facilities that promote urban growth or agriculture, etc.).

The take authorization/permit issued by the Service may incorporate some or all of the protection measures presented in this document. The take authorization/permit may include measures specific to the needs of the project and those requirements supersede any requirements found in this document.

EXCLUSION ZONES

In order to avoid impacts, construction activities must avoid their dens. The configuration of exclusion zones around the kit fox dens should have a radius measured outward from the entrance or cluster of entrances due to the length of dens underground. The following distances are **minimums**, and if they cannot be followed the Service must be contacted. Adult and pup kit foxes are known to sometimes rest and play near the den entrance in the afternoon, but most above-ground activities begin near sunset and continue sporadically throughout the night. Den definitions are attached as Exhibit A.

Potential den**	50 feet
Atypical den**	50 feet
Known den*	100 feet
Natal/pupping den (occupied and unoccupied)	Service must be contacted

*Known den: To ensure protection, the exclusion zone should be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by kit foxes. Acceptable fencing includes untreated wood particle-board, silt fencing, orange construction fencing or other fencing as approved by the Service as long as it has openings for kit fox ingress/egress and keeps humans and equipment out. Exclusion zone fencing should be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing shall be removed to avoid attracting subsequent attention to the dens.

**Potential and Atypical dens: Placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.

Only essential vehicle operation on existing roads and foot traffic should be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity should be prohibited or greatly restricted within the exclusion zones.

DESTRUCTION OF DENS

Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. The value to kit foxes of potential, known, and natal/pupping dens differ and therefore, each den type needs a different level of protection. **Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the Service**.

Destruction of the den should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgment of the biologist, the animal has escaped, without further disturbance, from the partially destroyed den.

Natal/pupping dens: Natal or pupping dens which are occupied will not be destroyed until the pups and adults have vacated and then only after consultation with the Service. Therefore, project activities at some den sites may have to be postponed.

Known Dens: Known dens occurring within the footprint of the activity must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use.

If kit fox activity is observed at the den during this period, the den should be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. **The Service encourages hand excavation, but realizes that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.**

Potential Dens: If a take authorization/permit has been obtained from the Service, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens should be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities shall cease and the Service shall be notified immediately.

CONSTRUCTION AND ON-GOING OPERATIONAL REQUIREMENTS

Habitat subject to permanent and temporary construction disturbances and other types of ongoing project-related disturbance activities should be minimized by adhering to the following activities. Project designs should limit or cluster permanent project features to the smallest area possible while still permitting achievement of project goals. To minimize temporary disturbances, all project-related vehicle traffic should be restricted to established roads, construction areas, and other designated areas. These areas should also be included in preconstruction surveys and, to the extent possible, should be established in locations disturbed by previous activities to prevent further impacts.

1. Project-related vehicles should observe a daytime speed limit of 20-mph throughout the site in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction should be minimized to the extent possible. However if it does occur, then the speed limit should be reduced to 10-mph. Off-road traffic outside of designated project areas should be prohibited.

2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep should be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the Service and the California Department of Fish and Game (CDFG) shall be contacted as noted under measure 13 referenced below.

3. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. 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 should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. 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.

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

5. No firearms shall be allowed on the project site.

6. No pets, such as dogs or cats, should be permitted on the project site to prevent harassment, mortality of kit foxes, or destruction of dens.

7. Use of rodenticides and herbicides in project areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control must be conducted, zinc phosphide should be used because of a proven lower risk to kit fox.

8. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name and telephone number shall be provided to the Service.

9. An employee education program should be conducted for any project that has anticipated impacts to kit fox or other endangered species. The program should consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program should include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the previously referenced people and anyone else who may enter the project site.

10. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. should be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is

disturbed during the project, but after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game (CDFG), and revegetation experts.

11. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the Service should be contacted for guidance.

12. Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916)445-0045. They will contact the local warden or Mr. Paul Hoffman, the wildlife biologist, at (530)934-9309. The Service should be contacted at the numbers below.

13. The Sacramento Fish and Wildlife Office and CDFG shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Service contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers below. The CDFG contact is Mr. Paul Hoffman at 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670, (530) 934-9309.

14. New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed should also be provided to the Service at the address below.

Any project-related information required by the Service or questions concerning the above conditions or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at:

Endangered Species Division
2800 Cottage Way, Suite W2605
Sacramento, California 95825-1846
(916) 414-6620 or (916) 414-6600

EXHIBIT “A” - DEFINITIONS

"Take" - Section 9 of the Endangered Species Act of 1973, as amended (Act) prohibits the "take" of any federally listed endangered species by any person (an individual, corporation, partnership, trust, association, etc.) subject to the jurisdiction of the United States. As defined in the Act, take means " . . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct". Thus, not only is a listed animal protected from activities such as hunting, but also from actions that damage or destroy its habitat.

"Dens" - San Joaquin kit fox dens may be located in areas of low, moderate, or steep topography. Den characteristics are listed below, however, the specific characteristics of individual dens may vary and occupied dens may lack some or all of these features. Therefore, caution must be exercised in determining the status of any den. Typical dens may include the following: (1) one or more entrances that are approximately 5 to 8 inches in diameter; (2) dirt berms adjacent to the entrances; (3) kit fox tracks, scat, or prey remains in the vicinity of the den; (4) matted vegetation adjacent to the den entrances; and (5) manmade features such as culverts, pipes, and canal banks.

"Known den" - Any existing natural den or manmade structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radiotelemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox. The Service discourages use of the terms ”active” and “inactive” when referring to any kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly.

"Potential Den" - Any subterranean hole within the species’ range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens shall include the following: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use.

"Natal or Pupping Den" - Any den used by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two, therefore, for purposes of this definition either term applies.

"Atypical Den" - Any manmade structure which has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.