

R E P O R T

**BIOLOGICAL RESOURCES
TECHNICAL REPORT
FOR THE SAN JOAQUIN
SOLAR POWER GENERATING FACILITY,
FRESNO COUNTY,
CALIFORNIA**

Prepared for

Martifer Renewables Solar Thermal LLC

URS Project No. 27658031.00900

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EXECUTIVE SUMMARY

The purpose of this Biological Resources Technical Report is to describe biological resources within the areas of potential effect for the Martifer Renewables Solar Thermal LLC Project Site. This report details the results of general wildlife surveys, focused and protocol special status species surveys, vegetation mapping, and a jurisdictional waters delineation conducted in the Project area.

The Project area is defined as the area that could potentially be directly or indirectly impacted during Project construction and operation. This includes the 640-acre Project site and a 500-foot buffer, and a 400-foot buffer on each side of the two proposed approximately 6-mile transmission line alternative routes. In addition to the immediate Project survey area, the habitats within 1 mile of the Project site and ¼ mile of the proposed transmission lines were characterized per California Energy Commission Guidance. The Project site is located on one section of land on the south side of Jayne Avenue approximately 6 miles east of Coalinga and approximately 3 miles west of Interstate 5, on the northern perimeter of the San Joaquin Valley farm district. The 6-mile offsite transmission line alignments start at the north and south boundaries of the Project site and go to the Gates substation. Figure 1, Regional Map San Joaquin Solar 1&2, displays the general topography of the Project Area and vicinity.

Prior to conducting field surveys, a review of literature was performed, including a query of the California Native Plant Society (CNPS) Inventory of Rare Plants Database, United States Fish and Wildlife Service (USFWS) species database, and the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDDB) to identify special-status species previously documented within the Project survey area and vicinity. Biological field surveys were conducted by URS in April and May 2008, June through August 2008, and December 1-12, 2008 in accordance with CEC regulations (CEC 2000, revised 2007), and CDFG and USFWS protocols for surveys of special-status species. The Project site was surveyed and found to be under active agricultural activities; therefore, no focused surveys for special-status species were conducted on the Project site.

Surveys of the northern transmission line routes included habitat assessment, vegetation and general wildlife surveys, and CDFG-protocol surveys for blunt-nosed leopard lizards (BNLL) (*Gambelia sila*) within 400 feet of the north and south sides of each of the alignment in June, July, and August 2008. Protocol small-mammal trapping surveys were conducted on both of the proposed alignments in December, 2008. CDFG0-protocol rare plant surveys will be conducted in spring 2009 on both alignments, and BNLL surveys will be performed on the southern transmission line alternative during the 2009 survey season.

The observed vegetation in and surrounding the Project study area is disturbed in nature and includes a disturbed grassland and saltbush scrub matrix and agricultural vegetation communities, (Figure 2). A CNDDDB query of the Project area and assessment buffers listed six special-status plant species that historically occurred or have the potential to occur within ten miles of the Project study site and alternative transmission line alignments, although none of these plant species were observed during field surveys. The CNDDDB lists 22 special-status wildlife species as historically detected and potentially occurring in the Project vicinity, with only a few special-status wildlife species having a low to moderate potential to occur in the Project study area. Five special-status wildlife species were observed along the transmission line routes during the 2008 surveys; none were observed within the Project site.

Biological field surveys resulted in the detection of the following special status species along the alternative transmission line routes:

Wildlife

Loggerhead shrike (*Lanius ludovicianus*)

Golden eagle (*Aquila chrysaetos*)

Northern harrier (*Circus cyaneus*)

Blunt-nosed leopard lizard (*Gambelia sila*)

American badger (*Taxidea taxus*)

SECTION 1 INTRODUCTION

This Biological Resources Technical Report has been prepared to support environmental compliance and permitting for the proposed development of a MRST solar-powered electric generating facility near Coalinga, California, at a site designated as San Joaquin Solar (SJS) 1&2, collectively referred to herein as the Project area. The purpose of this Biological Resources Technical Report is to describe biological resources within the areas of potential effect for the Project Site. This report details the results of special status species protocol and general wildlife surveys, vegetation mapping, and a jurisdictional waters delineation conducted in the Project area.

1.1 PROJECT DESCRIPTION

San Joaquin Solar 1&2 are two 53.4 MW net solar hybrid power stations. Martifer Renewables Solar Thermal LLC (MRST) will be leasing the property for use as a solar and biomass energy generation facility. Clean renewable energy will be produced from heat derived from the collection of solar radiation and the combustion of biomass, both employed to power a conventional steam turbine cycle.

Two alternative transmission line routes have been identified and evaluated. One proposed transmission line (the northern route) extends from the northeast corner of the Project site east, along the south side of West Jayne Avenue in or near the existing PG&E ROW to a point south of the Gates Substation. The second proposed transmission line (the southern route) extends from the southeast corner of the Project site east, along the section boundary line one mile south of and parallel to West Jayne Avenue to a point south of the Gates Substation. The southern route then turns north to Gates Substation. For both route options, the overhead line will begin at the dead-end structure in each Plant's switchyard and will continue east along the northern edge of SJS 2 solar field for approximately 1,500 feet, then either north or south for about 1,500 feet to the respective corner of the Project site. The transmission line will be approximately 6 miles long and will use 85-foot 230 kV Type A wood poles.

SECTION 2 ENVIRONMENTAL SETTING**2.1 PROJECT SETTING**

The proposed Project site is situated on 640 acres, located on the south side of Jayne Avenue, approximately 6 miles east of Coalinga and approximately 3 miles west of Interstate 5 on the northern perimeter of the San Joaquin Valley farm district. The Project site is located entirely within Section 3 of Township 21 South, Range 16 East on the Gujarral Hills and Avenal USGS 7.5-minute quadrangle maps. The northern Project boundary borders West Jayne Avenue (Figure 1). The northern route of the transmission line alternative is in or near an existing transmission right-of-way along the south side of West Jayne Avenue from the northeast corner of the Project area to the PG&E Gates Substation, and the southern alternative route is one-mile south of the northern route. Land use at the Project site, transmission line alignments, and vicinity is designated agricultural and rangeland, as well as public facilities. Land use in the immediate site vicinity includes livestock-related agriculture, cultivated crops, rural residential, and public facilities. The non-agricultural uses within a 1-mile radius of the Project site include Coalinga State Hospital and Pleasant Valley State Prison. Land use on both the northern and southern transmission line routes is comprised of disturbed native habitat for approximately 2 miles, then becomes intensive agricultural such as orchards and other cultivated crops. Both routes of the alignment would span Zapato Chino Creek.

The Project site is currently active farmland recently cleared and planted with wheat and pistachio crops, and has supported several types of crops, including cotton, safflower and garlic. Development onsite includes several unpaved service roads that separate different fields, an extensive irrigation system, a groundwater well with associated irrigation pump equipment above-ground storage tanks located near the southwestern corner of the site, and an abandoned concrete pad in the vacant, northwestern corner of the site. An approximately 1-acre area along the eastern property boundary is not part of the project. Based on historical information reviewed, the majority of the Project site has supported agricultural and livestock uses since approximately 1970.

2.2 FIELD SURVEY METHODOLOGY

The Project area is defined as the area that could potentially be directly or indirectly impacted during Project construction and operation. The 640-acre Project site includes the two solar field sites, construction laydown and parking areas, two biomass facilities, two power blocks, and transmission line connections. The Project survey area includes the Project site and a 500-foot buffer, and a 400-foot buffer on each side of the two proposed approximately 6-mile transmission line alternative routes. In addition to the immediate Project survey area, the habitats within 1 mile of the Project site and ¼ mile of the proposed transmission lines were characterized per California Energy Commission Guidance.

A site visit was conducted with URS staff and Justin Sloan, California Department of Fish and Game (CDFG) biologist on April 11, 2008 to allow CDFG staff to examine the site and agree on survey protocols prior to commencement of the survey season. Biological field surveys were conducted in accordance with CEC regulations (CEC 2000, revised 2007), CDFG and United States Fish and Wildlife Service (USFWS) protocols for surveys of special-status species. Surveys were conducted by URS, Quad Knopf, and AlphaBiota biologists from April through August 2008, and in December 2008, as defined by

protocol requirements described below (see Appendix C). A habitat assessment survey was conducted of the Project site and both sides of the northern transmission line alignment to the Gates substation connection in April and May, 2008. Areas that supported suitable habitat (i.e., were not under active agriculture including crop cultivation and orchards) were the areas where focused surveys for special status botanical and wildlife resources were conducted in 2008 (Figure 2; Figure 3 in Appendix H). The southern transmission alternative route was added to the assessment in late 2008. General wildlife and plant surveys, as well as focused botanical and protocol BNLL surveys will be performed on the proposed southern transmission line alternative route in spring and summer 2009.

Prior to conducting field surveys, a review of literature was performed, including a query of the California Native Plant Society (CNPS) Inventory of Rare Plants Database, USFWS, and the CDFG California Natural Diversity Database (CNDDDB) to identify special-status species previously documented within 10 miles of the Project survey area. These searches revealed a number of historical sensitive plant and animal locations within 10 miles of the Project site; however, only a few species were located within the Project survey area (Appendix B). The USFWS Recovery Plan for Upland Species of the San Joaquin Valley was also reviewed, as well as several documents that were developed in association with the City of Coalinga and Pleasant Valley Habitat Conservation Plan (HCP) processes in the Coalinga area in 2005-2007.

Based on the vegetation and habitat assessment survey of the 640-acre Project site (the site is currently active agriculture, including barley, row and pistachio crops), focused special-status species surveys were not conducted on the Project site. CDFG staff concurred with this assessment in April 2008. General plant and wildlife surveys, and CDFG-protocol surveys for blunt-nosed leopard lizards (BNLL) and San Joaquin antelope squirrel (SJAS) were conducted within 400 feet on the north and south sides of the proposed northern transmission line alignment adjacent to West Jayne Avenue in June, July, and August 2008. General wildlife surveys were conducted concurrently during these surveys. Protocol small-mammal trapping surveys were conducted in December, 2008. CDFG-protocol focused botanical surveys will be conducted on the northern and southern transmission line alignments, and protocol BNLL surveys will be conducted on the southern transmission line alignment in spring 2009.

The habitat assessment surveys of the Project survey area were conducted by URS senior biologists Dr. Patrick Mock and Theresa Miller on April 11, 2008 and by Theresa Miller on May 15, 2008. Vegetation types were delineated onto the aerial map in the field, and then later digitized into a geographical information system (GIS), including those areas within 1 mile of the Project study area. All areas were surveyed on foot, and all areas were visible from the survey routes. Animals were identified using scat, tracks, burrows, recognition of vocalizations, or direct visual observations with the aid of binoculars. All botanical and wildlife species detected during surveys were recorded, and locations of sensitive resources were mapped in the field with the aid of handheld Global Positioning System (GPS) units (5-meter accuracy) and plotted on a rectified 2005 aerial photograph using GIS.

Based on the habitat assessment and discussions with CDFG staff, CDFG-protocol surveys were conducted for the BNLL on the proposed northern transmission line route. Because the 640-acre Project site currently supports active agriculture, CDFG staff concurred that focused surveys for BNLL were not necessary on the Project site. Two BNLL survey periods are specified in the protocol: twelve (12) adult surveys between April 15 and July 31 and five (5) juvenile surveys between August 1 and September 15.

During the adult survey period, 12 transect surveys were completed within an 800-foot wide buffer (400 feet on each side of West Jayne Avenue) of the proposed northern transmission line alignment between May 28 and July 9, 2008. During the juvenile survey period, a total of five transect surveys were completed within the 800-foot wide buffer of the proposed northern transmission line route between August 9 and August 22, 2008. During the surveys, a team of four or five biologists walked in transects spaced 20 meters apart, searching for BNLL and other lizards. All surveys had one Level II surveyor present for every three Level I surveyors (3:1 ratio), as required by CDFG protocol. Each survey was started on the opposite side of the alignment from the previous survey to avoid introducing temporal or temperature biases to the BNLL surveys. The limits of temperatures and wind specified in the protocol were followed; all surveys were conducted within of the designated time of day (before 2 pm), temperature range (25-35 degrees Celsius (°C)) or wind ranges (maximum 10 mph sustained winds). BNLL surveys are planned for 2009 using the same protocol within a 800 ft wide corridor of the southern transmission line route.

Surveys for San Joaquin antelope squirrel (SJAS) (*Ammospermophilus nelsoni*) were conducted concurrent with BNLL surveys, as approved during coordination with CDFG staff. Since the Project site is comprised of active row crops, orchard, and other agricultural uses that is not suitable habitat, SJAS surveys were not conducted within the Project site; CDFG staff required that the surveys be conducted only within potential habitat. SJAS are known to be most active in temperatures up to 30°C; under the BNLL survey protocol, surveys occur between 25 C and 35°C. Because of this difference in favorable temperatures for optimal activity of the two species, surveys for SJAS were discontinued when temperatures reached the SJAS maximum temperature of 30°C, while the BNLL surveys continued if the BNLL protocol maximum was not met at the time. The location at which the temperature reached 30°C was noted, and the next survey was started near this location to avoid introducing temperature bias to the SJAS survey. Incidental observations of other detected species were recorded during the BNLL and SJAS surveys.

Nocturnal trapping surveys for small mammals were conducted within the disturbed non-native grassland, saltbush scrubland, and fallow agricultural lands along the northern and southern transmission line routes in December, 2008. Four trapping lines were established along the northern route (trap lines 1 through 4), consisting of 20 traps, 100 traps, 80 traps, and 100 traps, respectively (Figure 3 in Appendix H). Four trapping lines were established along the southern transmission line, consisting of 50 traps each. Traps were placed at intervals of approximately 15 meters along the trap lines. Each line was trapped for four consecutive nights; trap lines 1 through 4 were trapped from December 1-4, 2008 and trap lines 5 through 8 were operated from December 7-10, 2008. A combination of standard 9-inch and 13-inch kangaroo rat special Sherman live traps were used. The 9-inch traps were modified to minimize the potential for tail injuries to kangaroo rats. Traps were baited with mixed bird seed and opened prior to dusk each night. One trap check each night was conducted, commencing at approximately 2300 hours and concluding between 0200 and 0430 the following morning. Traps were closed after being checked. A total of 1,200 trap-nights were conducted along the northern transmission line route and 800 trap-nights were conducted along the southern transmission line route. Each animal that was captured was identified to species; weight, age, sex, and sexual condition were noted. Each captured rodent was marked by clipping a patch of fur on its right rump, and released at its point of capture. Notes on previous injuries or other anomalies were recorded. Curtis Uptain from Quad Knopf and Sundeep Amin from URS conducted trapping along

the northern transmission line route and Curtis Uptain and Rick Bailey from URS conducted trapping along the southern transmission line route (see Appendix H for greater detail).

During coordination discussions with staff from the CDFG Fresno Field Office, it was assumed that San Joaquin kit fox (SJKF) (*Vulpes macrotis mutica*) utilize the Project study area, and that protocol surveys for this species would not be necessary because of the SJS 1&2 location within the San Joaquin Valley and recent SJKF sightings documented in the vicinity. Burrowing owl (*Athene cunicularia*) have not been observed in the Project vicinity for several years; however, during the BNLL surveys, biologists searched for kit fox dens and burrowing owl sign or burrows to document usage of the Project study area by these species. Burrows that appeared to be suitable for kit fox or burrowing owl were scoped to confirm use within the Project. Sign of giant kangaroo rat and pocket mouse precincts or tracks, SJAS, and other special-status species with a potential to be present in the Project vicinity were also searched for during each survey on the Project site. Survey dates, personnel, and weather data for each survey are listed in Appendix C. BNLL survey data sheets, including weather data for each survey date, are provided in Appendix F. Resumes of the biologists that conducted the surveys are provided in Appendix G.

2.2.1 Jurisdictional Waters Delineation

A formal jurisdictional waters delineation per Army Corps of Engineers (ACOE) protocol was conducted as part of this assessment. Waters of the United States (U.S.), including vegetated wetlands, subject to jurisdiction pursuant to Section 404 of the Clean Water Act (CWA) were identified using methods describe by the ACOE (1987). Non-wetland waters of the U.S. were delineated based on the presence of an ordinary high water mark (OHWM) as defined at 33 CFR 328.3(e). The OHWM is defined as:

“The term ‘ordinary high water mark’ means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

Jurisdictional waters delineations were conducted to determine if areas subject to jurisdiction, pursuant to Section 1600 of the California Fish and Game Code, occur within the subject property. Section 1601(a) describes areas subject to its jurisdiction as:

“Except as provided in this section, general plans sufficient to indicate the nature of a project for earth moving by, or on behalf of, any state or local governmental agency or any public utility shall be submitted to the department if the project will (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit, (2) use material from the streambeds designated by the department, or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake designated by the department.”

Section 1601(a) is based on Title 14 California Code of Regulations (CCR) 720, which designates waters of the state to be:

“For the purpose of implementing Sections 1601 and 1603 of the Fish and Game Code which requires submission to the department of general plans sufficient to indicate the nature of a project for construction by or on behalf of any person, governmental agency, state or local, and any public utility, of any project which will divert, obstruct, or change the natural flow or bed of any river, stream, or lake designated by the department, or will use material from the streambeds designated by the department, all rivers, streams, lakes, and streambeds in the State of California, including all rivers, streams and streambeds which may have intermittent flows of water, are hereby designated for such purpose.”

Streams, including creeks and rivers, are defined at Title 14 CCR 1.72 as:

“A stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.”

A jurisdictional waters delineation for the Project was conducted by URS senior biologist Ms. Theresa Miller within the northern transmission line alignment in June 2008, and Quad Knopf biologists Curtis Uptain and Woody Moise delineated the channel where it intersects with the southern transmission line alignment in January, 2009. The delineations were performed to document the extent of jurisdictional waters within the SJS 1&2 Project area. Hydrological and vegetation conditions were evaluated along the length of an identified drainage channel (indicated as a “blue-line stream” on the USGS Topo map), and soil samples were taken in the channel where it intersects with the Project study area. The delineation identified whether hydrophytic vegetation, hydric soils, and hydrology were present within the channel. Soil data and CDFG channel width measurements were recorded, and the limits of the OHWM and the banks of the channel were measured and recorded using a Trimble submeter GPS unit and drawn onto an aerial map.

SECTION 3 FIELD SURVEY RESULTS

3.1 VEGETATION

The observed habitat in the Project study area is disturbed in nature and includes disturbed and agricultural vegetation communities, as defined by Holland (1995). The Project site is bare due to recent plowing, except in small areas of the Project site that appear to be access areas. In these areas, primarily non-native annual plant species are present. Plant species observed on the Project site include non-native species such as mustards, Russian thistle (*Salsola tragus*) and fiddleneck (*Amsinckia* spp.). Higher vegetation density occurs along each of the the transmission line routes, where dominant plant species include soft chess, Russian thistle, mustards, fiddleneck, red-stem filaree, California goldfields, and saltbush species until they reach the orchards and other cultivated agricultural approximately 2 miles east of the Project site. These agricultural land uses then continue to the point where the transmission line routes turn north and head to the substation through agricultural land uses. Figure 2 displays the vegetation communities in the Project study area, and Appendix D lists the plant species identified in the SJS 1&2 Project study area (including the Project site, transmission line alignments, and 1 mile assessment buffer surrounding the Project area) during the 2008 biological surveys. The existing plant communities within the Project study area are described below. Plant nomenclature follows Hickman (1993), and vegetation community identification follows Holland (1986).

Table 1
Vegetation Communities Observed within SJS 1&2 Project Site
and Proposed Transmission Line Routes

Community Name	Holland Code	Northern Transmission Route (acres)	Southern Transmission Route (acres)
Developed	12000	36.6	15.8
Agriculture	18300	446.6	930.5
Disturbed Valley Saltbush Scrub/Non-native Grassland Mosaic	36221/42200	165.1	32.2
Open Flood Channel	N/A	2.4	20.1
Total within Transmission Line Routes	N/A	650.6	998.6
Total including 640 acres of Agriculture on Project site	N/A	1,290.6	1,638.6

Developed

Developed lands (Holland Code 12000) include roads, built structures, and associated infrastructure and bare ground. Developed areas on the Project site include several unpaved service roads that separate fields, a groundwater well with associated irrigation pump equipment and aboveground storage tanks located near the southwestern corner of the site, and an abandoned concrete pad in the northwestern corner of the site. A total of 36.6 acres of developed lands are present within the 800-foot buffer the SJS 1&2 northern transmission line route and 15.8 acres are present within 800 feet of the southern transmission line route.

Agricultural Lands

Agricultural areas (Holland Code 18000) include actively cultivated lands, or lands that support nursery operations. The level of soil disturbance is such that only the species under cultivation and the most ruderal plant species would be expected to occur in this vegetative community. No grazing occurs on the Project site or in the immediate vicinity of the Project study area. The majority of the Project site is actively cultivated at this time, with pistachio and wheat cultivation in progress. In addition to the cultivated lands on the Project site, the majority of the proposed transmission line alignment is comprised of orchards and row crops. A total of 640 acres of agricultural lands are present on the SJS 1&2 site, 446.6 acres are present within the 800-foot buffer of the northern transmission line route, and 930.5 acres of agricultural lands are within 800 feet of the southern transmission line route.

Disturbed Valley Saltbush Scrub/Non-native Grassland Mosaic

Disturbed Valley saltbush scrub (Holland Code 36221) is intermixed with disturbed non-native grassland habitat within the proposed transmission line corridor to the north and east of the Project site. Because these two habitats were not mutually exclusive of one another, they are described together and calculation of the area covered by the two habitats was combined. A total of 165.1 acres of disturbed valley saltbush scrub/non-native grassland mosaic are present within the 800-foot buffer of the northern transmission line route, and 32.2 acres are found within 800 feet of the southern transmission line route.

Valley saltbush scrub is typically on sandy to loamy soils without surface alkalinity, characterized by open, gray- or blue-green chenopod scrubs (10-40% cover), usually over a low herbaceous annual understory. Cover types are dominated by common saltbrush (*Atriplex polycarpa*) or spinescale (*Atriplex spinifera*) (Holland 1986). Other species common within this habitat include larkspur, tarplant, and other annuals. Because the Valley saltbush scrub habitat that is present in the proposed transmission line alignment is sparsely distributed within the non-native grassland community, it is considered disturbed. This community is found to the north, south, and east of the Project site.

Non-native grassland habitat (Holland Code 42200) is characterized by a dense to sparse cover of annual grasses with native and non-native flowering forbs (Holland 1986). With a few exceptions, the plants in this association are dead through the summer and fall dry season, but persist as seeds. This habitat is a disturbance-related community most often found in old fields or openings in native scrub habitats. Common grasses include wild oat (*Avena spp.*), soft chess (*Bromus mollis*), ripgut grass (*Bromus diandrus*), and foxtail fescue (*Vulpia megalura*). Characteristic forbs include red-stem filaree (*Erodium cicutarium*), mustard (*Brassica spp.*), tarweed (*Hemizonia spp.*), California goldfields (*Lasthenia chrysostoma*), and owl's clover (*Orthocarpus purpurascens*). Species found within the Project area along the transmission line alignment include soft chess, Russian thistle, mustards, fiddleneck, red-stem filaree and California goldfields.

Non-Vegetated Channel or Floodway

Non-vegetated channels or floodways (Holland Code 64200) are unvegetated or sparsely vegetated drainages outside of the area of tidal influence. The lack of significant vegetative cover in such areas can be attributed to either natural processes, such as flooding, or to human activities, such as vegetation

clearing, sand mining, or stream channelization. Areas are designated as disturbed flood channels if the channel has been artificially cleared or disturbed, or if the channel is dominated by nonnative trees and lacks any native riparian component.

Tamarisk dominates the banks of the open channel in the Project area where Zapato Chino Creek crosses the transmission line alignment south of West Jayne Avenue. Individual cottonwood trees are present along the banks, as well as non-native grasses such as mustards and bromus. The channel is the apparent result of natural processes during heavy rain events in the valley. Approximately 2.4 acres of open channel is located within the 800-foot buffer of the northern transmission line route, and 20.1 acres is within 800 feet of the southern transmission line route.

3.2 WILDLIFE

The SJS 1&2 site provides limited habitat to support wildlife species as a result of the chronic disturbance caused by the current extensive irrigated agricultural activities. No surveys were conducted on the existing active agricultural field within the Project site or within existing orchards and farmlands found along the transmission line routes. However, surveys were conducted along approximately 2 miles of the proposed northern transmission line route where native habitat is present on the north and south sides of the proposed alignment along West Jayne Avenue. Surveys of the southern transmission line route will be conducted in 2009; however, the habitat is likely to support the same species that were observed on the northern transmission line in 2008. Therefore, this discussion encompasses both proposed routes with the potential detection of additional species associated with the southern transmission line route in 2009.

Within the 800-foot buffer of the northern transmission line route of the SJS 1&2 transmission line study area, 18 bird species, six reptile species and 10 mammal species were observed, or their sign was detected during the various surveys in 2008 and 2009. Typical bird species observed included house finch (*Carpodacus mexicanus*), western kingbird (*Tyrannus verticalis*), western meadowlark (*Stunella neglecta*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura*), horned lark (*Eremophila alpestris*), loggerhead shrike (CA Species of Special Concern [SSC]), golden eagle (SSC), barn owl (*Tyto alba*), great-horned owl (*Bubo virginianus*), and red-wing blackbird (*Agelaius phoeniceus*).

Coyote (*Canis latrans*), California ground squirrel (*Spermophilous beecheyi*), black-tailed jackrabbit (*Lepus californicus richardsonii*), cottontail rabbit (*Sylvilagus audubonii*), and Heerman's kangaroo rat (*Dipodomys heermanni*) were common mammals observed or detected within the SJS 1&2 transmission line alignment survey area. Two bobcat (*Lynx rufus*) were observed on or near the northern transmission line survey area. One bobcat was observed as road kill on Sutter Avenue south of the Project site, and an American badger (SSC) was observed as road kill on West Jayne Avenue along the northern transmission line alignment. Kangaroo rat tracks and scattered burrow complexes were observed in various locations along the northern transmission line survey area. Reptile species observed include western whiptail (*Cnemidophorus tigris*), San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), side-blotched lizard (*Uta stansburiani*), and Pacific gopher snake (*Pituophis catenifer catenifer*). Wildlife species identified in the Project survey area and the vicinity are shown on Figure 3 and in Appendix E.

During the nocturnal small mammal trapping program, only heerman's kangaroo rats and deer mice (*Peromyscus maniculatus*) were captured along both the northern and southern transmission line routes (Table 1). *D. heermanni* were captured more frequently than *P. maniculatus*, with 313 individual kangaroo rats captured a total of 552 times versus 80 deer mice being captured a total of 126 times. The majority of captures of both species (93% of *D. heermanni* and 75% of *P. maniculatus*) were captured along the northern transmission line (plots 1 through 4). This is not unexpected because there was more habitat available, the habitat was less disturbed, and there was a greater sampling effort (1,200 trap nights in the northern trapping areas versus 800 trap nights in the southern trapping areas). After adjusting for different sampling effort, the northern trapping areas remained superior to the southern trapping areas on a per-acre basis. The majority of all animals captured were adults (100% of *D. heermanni* and 85% of *P. maniculatus*). Further details on the results of the trapping program are provided in Appendix H.

Other species of small mammals known from the trapping sites include the pocket gopher (*Thomomys bottae*), cottontail (*Sylvilagus auduboni*), and black-tailed jackrabbit (*Lepus californicus*). Other small mammal species known from the vicinity of the project sites include the California pocket mouse (*Cheotodipus californicus*), San Joaquin pocket mouse (*Perognathus inornatus*), Tulare grasshopper mouse (*Onychomys torridus*), Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*), and San Joaquin antelope ground squirrel (*Ammospermophilus nelsoni*). There was no evidence collected during the trapping efforts that confirms the presence of these species on the project site. However, the San Joaquin antelope ground squirrel is a crepuscular species that was not targeted by this trapping effort. Although no sign of this species was observed either during these trapping efforts or during other biological surveys of the project sites, it is recommended that focused trapping for the San Joaquin antelope ground squirrel be conducted prior to ground clearing activities for the transmission line.

3.3 SPECIAL STATUS PLANT SPECIES

Plant species of special management concern are considered rare, threatened, or endangered by the USFWS, CDFG, and/or CNPS. No rare, threatened, or endangered plants were detected onsite. A CNDDDB query listed six special-status plant species that historically occur or have potential to occur within ten miles of the Project study site and transmission line alignment. Suitable habitat is not present for many of the special-status plants in the Project survey area, as the majority of the plant species have been recorded to the north or southeast in alkali soils, chenopod scrub, chaparral, saltbush scrub, or vernal pools/salt marshes, and are not found in disturbed habitat such as agricultural land. Special-status plant species that have been previously recorded within 10 miles of the Project are discussed in Appendix C. No plant species of special management concern were detected during the 2008 survey effort. Rare plant surveys of the transmission line routes will be conducted in spring 2009.

3.4 SPECIAL STATUS WILDLIFE SPECIES

Special-status wildlife species are those considered rare, threatened, or endangered by the USFWS or CDFG. The CNDDDB query lists 22 special-status wildlife species as historically present and potentially occurring in the Project vicinity. Most of these special-status species records are located outside of the Project study area, within the undisturbed areas of the Central Valley, and are not expected to occur in the Project study area due to lack of suitable habitat. Only a few special-status wildlife species such as San Joaquin kit fox (*Vulpes macrotis mutica*, SE, FE) (SJKF), San Joaquin antelope squirrel, short-nosed

kangaroo rat, San Joaquin pocket mouse, California horned lark (recently downgraded from SSC to the CDFG watch list), and BNLL have been recorded within the Project vicinity. Five special-status wildlife species were observed within the Project survey area during the 2008 and 2009 surveys: loggerhead shrike (SSC), golden eagle (SSC), Blunt-nosed Leopard Lizard (Federal Threatened and CDFG Endangered and Fully Protected), northern harrier (SSC), and American badger (SSC). CNDDDB data sheets for several of these species are included in Appendix F. Potential SJFK dens were observed along the northern transmission line route but they were not active at the time of surveys and therefore not confirmed. However, because an urban population of SJKF is known to be present in Coalinga and because the Project area provides suitable habitat, it is assumed that SJKF utilize habitat within the Project site and transmission line routes.

American Badger

Regulatory Status: State Status: Species of Special Concern; Federal Status: None

This moderately-sized terrestrial mammal has a flattish body, more width than height, with short bowed legs, a shaggy coat from grizzled gray to brown, and a short, bushy, yellowish tail. In California, badgers occupy a diversity of habitats. Their principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, and mountain meadows near timberline are preferred. Badgers prey primarily on burrowing rodents such as gophers (*Thomomys* spp.), ground squirrels (*Spermophilus* spp., *Ammospermophilus* spp.), marmots (*Marmota* spp.), and kangaroo rats (*Dipodomys* spp.). They are predatory specialists on these rodents, although they will eat a variety of other animals including mice, woodrats, reptiles, birds and their eggs, bees, and other insects. The male is larger than the female. Mating usually occurs between July to August with implantation delayed until February. A litter of one to five young is born typically between March to April. Dens have one entrance, with a pile of dirt just outside that may serve as a latrine area. This powerful burrower is basically nocturnal but is often active by day.

Its home range varies from about 590 to 4,200 acres (240 to 1,700 hectares). The home range of the male is larger and encompasses the ranges of several females. American badgers occur from northern Alberta southward to central Mexico, and range from the Pacific Coast eastward through Ohio. They are absent from the humid coastal forests and from other regions with dense forests. In California, badgers once ranged throughout the state except for the humid coastal forests of northwestern California in Del Norte County and the northwestern portion of Humboldt County. Badger populations have declined drastically in California within the last century, and many populations have been extirpated from urbanizing areas of the state (e.g., coastal areas). Localized populations are reduced or declining, but most of original range is still occupied. Deliberate killing probably has been a major factor in the decline of badger populations. Most people regard badgers as detrimental to their interests and attempt to kill them. Land conversion for agricultural production is adverse to badgers, as they do not survive on intensely cultivated lands. Agricultural and urban developments have been the primary causes of decline of local populations of badgers in California. Rodent and predator poisoning pose double threats through direct and secondary poisoning of badgers and elimination of the food badgers are dependent upon. One roadkilled badger was observed along West Jayne Avenue during juvenile BNLL surveys in 2008. One recent badger burrow was observed on the north side of the northern transmission line corridor survey area; it was found the

same day the dead badger was observed on West Jayne Avenue and is assumed to be the burrow for that badger.

Blunt-Nosed Leopard Lizard

Regulatory Status: State Status: Endangered, Fully Protected; Federal Status: Endangered

The BNLL lives in grassland and scrub habitats in the southern San Joaquin Valley. BNLL eat mostly insects, but opportunistically consume smaller lizards, including young leopard lizards. BNLL are polygamous, with one male mating with several females, and eggs and young are produced during summer and early fall. Predators include snakes, birds, and carnivorous mammals, including the San Joaquin kit fox. Primary threats to the BNLL include habitat fragmentation, disturbance, and destruction. The BNLL is listed as endangered by both the federal government and the state of California (USFWS 1998), and is a CDFG fully protected species. The nearest CNDDDB record of BNLL is located in the valley scrub/grassland mosaic habitat adjacent to the Project site. One adult BNLL was observed at the CDFG Pleasant Valley Ecological Reserve (PVER) satellite site located adjacent to the Project site and within the southern transmission line alternative during protocol surveys of the PVER in June 2008 (Figure 3). No BNLL were observed on the SJS 1&2 site. Protocol surveys of the southern transmission line route will be conducted beginning in April 2009.

Western Burrowing Owl

Regulatory Status: State Status: Species of Special Concern; Fully Protected Federal Status: USFWS Bird of Conservation Concern and Bureau of Land Management (BLM) sensitive designations

Burrowing owl is a small ground-dwelling bird with a round head and no ear tufts. They have white eyebrows, yellow eyes, and long legs. The owl is sandy colored on the head, back, and upperparts of the wings, and white-to-cream with barring on the breast and belly, and a prominent white chin stripe. Burrowing owls are typically found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, particularly prairie dogs, ground squirrels, and badgers. Burrowing owls are comparatively easy to see because they are often active in daylight, and are surprisingly bold, approachable, and generally active at dusk and dawn, but sometimes also at night. They are highly terrestrial, and are often seen perched on a mound of dirt, telegraph or fence post, frequently on one foot. They bob up and down when excited. Burrowing owls feed on a wide variety of prey, changing food habits as location and time of year determine availability. Large arthropods, mainly beetles, crickets and grasshoppers, comprise a large portion of their diet. Small mammals, especially mice, rats, gophers, and ground squirrels, are also important food items. Other prey animals include reptiles and amphibians, scorpions, young cottontail rabbits, bats, and birds, such as sparrows and horned larks. During the nesting season, adult males forage over a home range of 2 to 3 square kilometers. Burrowing owls are able to live for at least 9 years in the wild and over 10 years in captivity.

The nesting season begins in late March or April. Burrowing owls are usually monogamous, but occasionally, a male will have two mates. Burrowing owls nest underground in abandoned burrows dug by mammals or, if soil conditions allow, they will dig their own burrows. Adults usually return to the same burrow or a nearby area each year. One or more “satellite” burrows can usually be found near the nest burrow, and are used by adult males during the nesting period and by juvenile owls for a few weeks

after they emerge from the nest. It is this ground nesting that makes the owl vulnerable to injury and mortality by human-caused activities such as vehicle and equipment operation, farming practices, road building, etc. They are often killed by vehicles when crossing roads, and have many natural enemies, including larger owls, hawks, falcons, badgers, skunks, snakes, cats, and dogs. This species was formerly a common, even locally abundant, permanent resident throughout much of California, but a decline noticeable by the 1940s has continued through to the present time. The reasons for the decline include conversion of grasslands and pasturelands to agriculture and destruction of ground squirrel colonies. Assimilation of poisons applied to ground squirrel colonies has probably also taken a toll. Burrowing owl have not been detected during general and protocol surveys conducted in the Project area in 2008; furthermore, they were not detected during surveys for the habitat conservation planning process in 2005 and 2006 (CDFG 2008).

Golden Eagle

Regulatory Status: State Status: Species of Special Concern, Fully Protected; Federal Status: Protected under Bald Eagle Protection Act

Golden eagles are distributed throughout North America, Eurasia, and north Africa (Johnsgard 1990). Golden eagles occur as breeding residents in the western half of the United States and formerly nested in the northeast (Johnsgard 1990). Golden eagles forage in grassy and open shrubby habitats and nest primarily on cliffs, with secondary use of large trees (*e.g.*, oaks and sycamore). Breeding pairs may occupy territories of several square miles, within which they may often use several nest sites, shifting nests sites from year to year. This species has declined because of loss of foraging and nesting habitat to urban and agricultural development, human persecution (illegal shooting), incidental poisoning of prey species (*e.g.*, ground squirrels and prairie dogs), egg collecting, power line electrocution, and human disturbance at the nest (Snow 1973, Johnsgard 1990, Scott 1985). One golden eagle was observed during the 2008 biological surveys flying over the riparian habitat where Zapato Chino Creek crosses the proposed northern transmission line route.

Hoppings Blister Beetle (Lytta hoppingi)

Regulatory Status: State Status None; Federal Status: Threatened

The Hoppings Blister Beetle is found in the foothills in the southern end of the Central Valley. This beetle is black with brown wings and orange markings on the head and thorax. Adults are often found on flowers. Very little is known about the life history or behavior of this species, but they have been collected from late March through June. Females excavate shallow burrows in which to oviposit, then the female brings soil down into the burrow and covers the egg mass. Some species in the genus are known to produce 80 to 250 eggs. This species has been recorded approximately 7 miles northwest of the Project site, and is not expected to occur within the Project area.

Le Conte's Thrasher (Toxostoma lecontei)

Regulatory Status: State Status: Species of Special Concern; Federal Status: Bird Species of Conservation Concern

The Le Conte's Thrasher is pale gray-brown on the upperparts and pale buff on the underparts. The long tail is dark brown to blackish, and contrasts with the pale body. Le Conte's Thrasher is a widespread, but uncommon permanent resident in the western and southern San Joaquin Valley, upper Kern River Basin, Owens Valley, Mojave Desert, and Colorado Desert in southwestern United States. California serves as a main population center for this species. Though the extent of its known range has not changed since the late 19th Century, much of its U.S. habitat within that range has been lost to development, resulting in great reductions locally in its numbers. Earliest nesting for this non-migratory species begins in February in California, peaking in mid-March through April. It prefers breeding in saltbush/shadscale vegetation or cholla cacti in sandy substrate. It is sensitive to disturbance, including off-road vehicle use, livestock grazing, oil drilling and development. Its typical habitat is sparsely vegetated desert flats, dunes, or gently rolling topography with a high proportion of species of saltbush or shadscale and cholla cactus. Most of the shrubs are below 2.5 m in height. It digs small pits in the ground with its long bill, searching for seeds, insects, and small vertebrates in the litter; it will also take small bird eggs. Portions of the habitat within the SJS 1&2 transmission line routes are marginally suitable for this species; however no individuals of this species were detected during the 2008 surveys.

Loggerhead Shrike

Regulatory Status: State Status: Species of Special Concern; Federal Status: Bird Species of Conservation Concern

Loggerhead shrike is a robin-sized gray bird with black wings, white wing-patches, a black mask, and a black tail. Both sexes look alike. Found year-round in most of Mexico and the southern half of the United States. Throughout most of the southern part of its range, the loggerhead shrike is resident; northern populations are migratory. Where resident, this species usually lives in pairs on permanent territories. Loggerhead shrike breeding habitat is generally characterized as open areas dominated by grasses and/or forbs, interspersed with shrubs or trees and bare ground. Available cover is the most important criterion for nest site selection, and trees with thorns are preferred. The prey typically consists of small birds, mice, or large insects. Loggerhead shrikes will stun or kill prey with their powerful, hooked beak before impaling it on a plant thorn or barbed-wire fence, then the prey will then be picked apart over time. Threats to the loggerhead shrike include changes in human land-use practices, the spraying of biocides, and competition with species that are more tolerant of human-induced changes. This species was observed during the 2008 surveys (Figure 3).

Long-Eared Owl (Otus wilsonianus)

Regulatory Status: State Status: Species of Special Concern; Fully Protected Federal Status: None

The Long-eared owl breeds from western Canada to the Maritime Provinces, southward to Baja California, southern Arizona and New Mexico, and the Great Lakes region. This bird is partially migratory, moving south in winter from the northern parts of its temperate range. Though widespread and

relatively common in its range, it is rarely seen. The Long-eared owl's breeding season is from February to July and it nests in trees, often coniferous, using the old stick nests of other birds such as crows, ravens, magpies and various hawks. It inhabits dense vegetation adjacent to grasslands or shrublands, as well as open forests. The species diet consists of mostly small mammals and birds. Long-eared owl populations appear to be stable in most of North America, but in some portions of its range this species has declined due to the loss of riparian vegetation, conversion of hunting areas to intensive agricultural land uses, and reforestation of open areas. This species is not likely to be present within the Project site; however, it may use the riparian habitat located to the south and west of the Project, and may forage where the SJS 1&2 area support potentially suitable habitat.

Merlin (Falco columbarius)

Regulatory Status: State Status: Species of Special Concern, Fully Protected; Federal Status: None

The Merlin is a small hawk with long and pointed wings, a long banded tail, a faint mustache mark, brown streaking on chest and belly, and its back is unmarked gray or brown. American subspecies range from pale (Great Plains) to nearly black (Pacific Northwest). The sexes differ in adult plumage, with females noticeably larger than males. It breeds in open country from open coniferous woodland to prairie, occasionally in adjacent suburbs, and winters in open woodland, grasslands, open cultivated fields, marshes, estuaries, and seacoasts. It is a rare winter visitor in southern California. Primarily monogamous, the Merlin raises one brood each breeding season. Most Merlins will use abandoned corvid or hawk nests in conifer or mixed tree stands. They will also build nests on cliff faces and on the ground. Most prey are smaller birds (10-40 g), with local preferences for larks, pipits, sandpipers and house sparrows. Almost any bird that is locally abundant will be taken, up to the size of rock pigeons. Breeding pairs will frequently hunt cooperatively, with one bird flushing the victims towards their mate. Other prey includes insects (dragonflies and moths), small mammals (bats and voles) and reptiles. One record of this species is located approximately 9 miles northeast of the Project site and 4 miles east of Gates substation along the California Aqueduct. Merlins are likely to forage over the SJS 1&2 area and surrounding habitats.

Molestan Blister Beetle (Lytta molesta)

Regulatory Status: State: None; Federal: Threatened

The Molestan blister beetle is black with orange markings on the thorax, and ranges from 11-22 mm in length. They can be found throughout Central California. Adults are often found on flowers. Very little is known about the life history or behavior of this species, but they have been collected from early April to early July. *Lytta* larvae are nest parasites of solitary bees; the beetle larvae feed on the pollen stores that the female bee has provided for her own larvae. One record of this species is located approximately 9 miles northeast of the Project site; this species has not been observed in the Project study area.

Northern Harrier

Regulatory Status: State Status: Species of Special Concern; Federal: None

Northern harriers are a medium sized, long-winged, long-tailed hawk, with a flat face with an owl-like facial disk, dark bars on the tail, and a white rump. Habitats include grasslands, steppes, wetlands,

meadows, cultivated areas, and tundra. Northern harriers prey on small mammals, birds, reptiles, insects, and carrion, and hunt using a low, slow flight over the ground, then plunge onto their prey. Harriers roost and nest on the ground, often in groups in a traditional location. Northern harriers nest on the ground in thick grass, shrubbery, or other vegetation. The nest is a pile of sticks and grass. The female lays 3 - 6 eggs depending on the abundance of small rodents. This species used to be a common resident in the southern coastal area. At present, nesting localities are still scattered throughout the state, but numbers are much reduced, particularly in the southern coastal area, around San Francisco Bay, and in the Mono Lake area. The bulk of the breeding population is concentrated in ungrazed portions of state and federal wildlife refuges (CDFG, 2007). Northern harrier were observed in the within the vicinity of the northern and southern transmission line alignments of the Project study area in 2009 and potentially use the disturbed grassland habitat within the transmission line alignments for foraging. The Project site would provide marginal foraging habitat for harriers, and ground-nesting habitat may be present within the Project survey area in the disturbed grassland areas at a distance greater than 500 feet from Jayne Avenue.

San Joaquin (Nelson's) Antelope Squirrel

Regulatory Status: State: Threatened; Federal: None

The San Joaquin antelope squirrel (SJAS) is one of five species of antelope squirrels. The species is omnivorous, with a diet consisting primarily of grass, seeds, and insects. Antelope squirrels are fossorial animals that occur in grasslands with moderate shrub cover where they use burrows that they or other animals have dug. They require widely scattered shrubs, forbs, and grasses in broken terrain with gullies and washes and loam soils (CNDDB 2007). This species is most active during spring and summer months when air temperatures are between 68 to 86 °F. Historically, SJAS ranged from western Merced County to the southern end of western San Joaquin Valley, and occupied the valley floor in Kern County and along the eastern edge northward to Tipton, Tulare County. The current species range is restricted to marginal habitats of the low foothills of the western edge of the San Joaquin Valley, and populations of significant size only exist in western Kern County at Elk Hills and on portions of the Carrizo and Elkhorn plains. Conversion of native habitat to intensive forms of agricultural development is the greatest threat to this species (CDFG 2007). SJAS have been recorded near the Project site; however, this species was not detected during the 2008 daylight surveys or during the nocturnal small mammal trapping surveys in 2008.

San Joaquin Dune Beetle (Coelus gracilis)

Regulatory Status: State: None; Federal: Threatened

The San Joaquin Dune Beetle is fairly robust, dorsally inflated, and ranges in color from pale yellowish-brown to dark brownish-black. The female is slightly larger than the male. Historically, the range of the San Joaquin dune beetle extended from Contra Costa County in the north, to the Kettleman Hills in Kings County in the south. They inhabited inland sand dunes within this range. Currently, this beetle is restricted to small isolated sand dunes (250 - 10,000 m²) along the western edge of the San Joaquin Valley. Little information exists on the feeding habits of San Joaquin dune beetles, though they probably feed on decomposing vegetation buried in the sand. Certain related beetles feed mostly on dung. Nothing is known about the mating system or breeding season of San Joaquin dune beetles. In general, female

beetles lay eggs singly or in masses, with hatching occurring after several days. The presence of immature dune beetles and larvae is evident throughout the year, which suggests that egg-laying occurs over a long period. The larvae develop and pupate exclusively in the sand. This species was recorded approximately 4.5 miles southwest of the Project site. The habitat on the SJS 1&2 site is not suitable for this species.

San Joaquin Kit Fox

Regulatory Status: State: Endangered; Federal: Endangered

The SJKF historically ranged throughout the San Joaquin Valley from Contra Costa County in the north to northern Santa Barbara County in the south. Currently, SJKF still has a wide distribution; however, kit fox numbers are greatly reduced and populations are isolated from one another. Kit foxes primarily live in grassland and to a lesser extent, shrub, and agricultural habitats. Kit foxes predominantly eat rodents, ground squirrels, rabbits and hares, and ground-nesting birds. Kit fox pups are born in late winter and early spring, and the male provides most of the food for the female while she is nursing. Kit foxes change dens frequently, and often enlarge existing ground squirrel burrows in order to make new dens. Predation or competitive exclusion of kit foxes may occur in the presence of coyotes, introduced red foxes, domestic dogs, bobcats, and large raptors. Human threats to kit fox include destruction of habitat, habitat degradation, predators, pest control programs, and accidents caused by proximity to humans such as electrocution, roadkill, and suffocation from accidental burial in dens. Finally, natural factors such as drought, flooding, and rabies cause a significant percent of kit fox deaths. The SJKF is currently listed as an endangered species by both the federal government and the state of California (USFWS 1998). CNDDDB records of San Joaquin kit fox are located within 1 mile of the Project area. Several CNDDDB records of kit fox are located within 1 and 2 miles of the Project site. Kit fox apparently move through the Project vicinity, and potential kit fox dens were observed on the north side of the northern transmission line alignment during the 2008 surveys. California ground squirrels are present on the Project site and likely comprise an potential forage base for SJKF in the project vicinity.

*Short-Nosed Kangaroo Rat (*Dipodomys nitratoides brevinasus*)*

Regulatory Status: State: Species of Special Concern; Federal: None

The short-nosed kangaroo rat is nocturnal and active year-round. They can be distinguished from other kangaroo rats within its geographic range by the presence of four toes on its hind foot; the other species in the area have five toes. They inhabit grasslands with scattered shrubs and desert-shrub associations on powdery soils. They also inhabit highly saline soils around Soda Lake on the Carrizo Plain, and less saline soils elsewhere. Over most of their range, they are generally more numerous in lighter, powdery soils such as the sandy bottoms and banks of arroyos and other sandy areas. At higher elevations in the western portion of its geographic range, the reproductive season of the short-nosed kangaroo rat is about two to three months shorter than on the Valley floor, with breeding beginning in late February or March and typically ending by May. In years with a prolonged wet spring, individuals may continue breeding through August. The extensive agricultural development of the 1960s and 1970s within its historical range is the main cause of short-nosed kangaroo rat decline. The extent of its current distribution is unknown. This species was not detected on either of the proposed transmission line routes during the small mammal trapping program that was conducted in early December 2008.

Silvery Legless Lizard (Anniella pulchra pulchra)

Regulatory Status: State Status: Species of Special Concern; Federal Status: None

This species ranges from the San Francisco Bay Area of California south into northwestern Baja California; it also occurs on several offshore islands. It is known from sea level to 5,085 feet. The species is found in areas with loose, moist soil (sand or loam) in chaparral, oak woodlands, and, in particular, coastal dunes with sparse vegetation. The shiny legless lizard is with eyelids but without external ear openings. Usually silvery or tan with dark stripe down middle of back, dark striping on sides. Their back is sometimes completely dark and their belly yellow. The species is primarily fossorial by day, but emerges to forage at night. Its small smooth scales and blunt tail make burrowing easy for this lizard. Most of their time is spent under the surface of the soil or beneath leaf litter, where it eats small insects and their larvae. The species is not threatened at present, but agriculture has eliminated many California populations. It is not expected to occur in the Project study area.

Swainson's Hawk (Buteo swainsoni)

Regulatory Status: State Status: Threatened, Fully Protected; Federal Status: None

The Swainson's is a slender hawk with a long tail and pointed wings compared to other buteos. The tail is grayish with narrow, dark bands. This species forages in open stands of grass-dominated vegetation, sparse shrublands, and small, open woodlands; however, it has adapted well to foraging in agricultural areas in many parts of its range. This hawk cannot forage in most perennial crops or in annual crops that grow much higher than native grasses, as prey is more difficult to find. In the Central Valley, the Swainson's hawk forages in row, grain, and hay crop agriculture, particularly during and after harvest when prey are both numerous and conspicuous. Breeding occurs in west to central Washington and Oregon, extreme northeastern California (Bloom 1980), western and southern Nevada, northern and southeastern Arizona (Monson and Phillips 1981), and disjunctly in California in the Sacramento and San Joaquin valleys, valleys of the Sierra Nevada in Inyo and Mono counties, and occasionally elsewhere. Swainson's hawks mainly hunt mice, ground squirrels, rabbits, birds, and reptiles during the breeding season, and live off of insects like grasshoppers, locusts, and beetles during the non-breeding season. They're a highly gregarious species that can be seen foraging and migrating in flocks up to thousands of birds. This species was not observed in the Project area during the 2008 surveys, and there are no historical sightings recorded on the CNDDDB nearby. Therefore, Swainson's hawk is not expected to utilize potentially suitable habitat in the vicinity of the SJS 1&2 site.

Tricolored Blackbird (Agelaius tricolor)

Regulatory Status: State Status: Species of Special Concern; Federal Status: None

This species closely resembles red-winged blackbirds, with differences in coloration, bill shape, and overall morphology. Tricolored blackbirds are opportunistic foragers and will consume any locally abundant insect resource, including grasshoppers (Collier 1968), grains (maturing and ripe seeds), snails (Martin *et al.*, 1951), and small clams (Skorupa *et al.*, 1980). Suitable habitat is found in freshwater marshes dominated by cattails (*Typha* spp.) or bulrushes, and foraging habitat includes perennial grasslands and riparian woodlands in the Central Valley. Most of Central Valley has been converted to

agriculture and urbanization; however, agricultural fields may provide forage habitat and abundant insect prey. Tricolored blackbirds have recently been observed forming “mega-colonies” in grain fields that can reach over 100,000 birds. The majority of the mega-colonies are associated with dairy farms in the San Joaquin Valley, where the birds utilize the habitat for building nests and foraging in the open water and irrigated pastures (Kelsey 2008). During a statewide survey for tricolored blackbirds by Audubon California in 2008, only 1,000 birds were counted in Fresno County, and only one of the three known breeding colonies in the county was occupied (Kelsey 2008). Therefore, it is unlikely that this species would utilize the habitat in the Project vicinity.

Tulare Grasshopper Mouse (Onychomys torridus tularensis)

Regulatory Status: State: Species of Special Concern; Federal: None

The Tulare grasshopper mouse lives in arid grasslands, shrub lands, and alkali sink habitats in the San Joaquin Valley. This species is carnivorous, feeding on scorpions, beetles, grasshoppers, pocket mice, western harvest mice, lizards, and frogs with some seeds taken when no other food sources are available. Young are born in the late spring to early summer and both parents care for them. Grasshopper mice are territorial and males will produce a sharp call to mark their territory. Predators of this species include badgers, SJKF, coyote, and barn owls. Primary threats include habitat destruction and fragmentation and the use of pesticides. This species was not detected on either of the proposed transmission line routes during the small mammal trapping program that was conducted in early December 2008.

Western Mastiff Bat (Eumops perotis californicus)

Regulatory Status: State: Species of Special Concern; Federal: None

The Western mastiff bat has a body length of 5½ to 7½ inches and a wingspan of over 22 inches. It has chocolate brown fur. In California, the *E. perotis* is most frequently encountered in broad open areas. Generally, this bat is found in a variety of habitats, from dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, montane meadows, and agricultural areas. During the day western mastiff bats form colonies of less than 100. At least 3 meters of open space is needed under its roosting site for takeoff. It feeds mostly on moths, and will often drop down and forage on the ground with its tail sticking up. Threats to this species include loss of large open-water drinking sites, disturbance or destruction of cliff habitats and urban/suburban expansion. Western mastiff bats may forage in the Project vicinity; however, this species is not expected to roost within the Project site.

Western Spadefoot Toad (Spea [Scaphiopus] hammondi)

Regulatory Status: State: Species of Special Concern; Federal: None

The western spadefoot toad is a small pelobatid toad that occurs in the Central Valley of California and west of the coastal ranges from Point Conception to northern Baja California (CDFG 1988). This species spends much of the year in burrows, emerging at night during the early spring rains to breed in temporary ponds, vernal pools, and backwaters of slow-flowing creeks. The remainder of the year is spent in upland habitats such as grasslands and coastal sage scrub, where burrows are constructed. Tadpoles grow at an accelerated rate and transform in as little as three weeks in short-lasting pools; longer in deeper pools. The

western spadefoot is best surveyed at night, preferably after a warm rain, and tadpoles are readily identifiable at later developmental stages. Because no temporary ponds or slow-flowing creeks are present on the Project site or within the transmission corridor, and upland habitat that is present is not suitable for burrowing, this species is not expected in the Project survey area and was not detected during the 2008 biological surveys.

3.5 WILDLIFE MOVEMENT

A wildlife corridor is defined as a linear landscape feature that allows animal movement between two patches of habitat or between occupied habitat and geographically discrete resources (e.g., water). To function effectively, a corridor must accomplish two basic functions. First, it must effectively link two or more large patches of habitat. The corridor must conduct animals through the landscape to areas of suitable habitat without excessive risk of directing them to unsuitable areas where risk of mortality may be very high. Second, the corridor must be suitable to the focal target species so that they will use the corridor frequently enough to achieve the desired demographic and genetic exchange between populations.

Corridors are often defined by their use by focal species. Focal species are those that naturally occur in low densities and that may be unwilling or unable to cross extensive areas of development or otherwise unfavorable habitat. Animals have a natural aversion to situations or physical settings they perceive to be dangerous and will often shy away from situations in which they are exposed without cover or escape routes. The presence of disturbance outside of the animal's normal experience is also a situation that is often avoided by animals. In the California Central Valley, potential focal species for wildlife movement assessment in the San Joaquin Valley could include mountain lion (*Felis concolor*), coyote, deer, bobcat, SJKF, and American badger.

The SJS 1&2 Project site is located entirely within existing active agricultural use, and the site is surrounded on the west, south, and east by agricultural, disturbed, or developed land uses. The majority of the area within the proposed transmission line corridor is agriculture, including orchards. The Project vicinity provides an open and unconstrained environment for wildlife movement. In addition, Zapato Chino Creek is a widely-cut, usually dry channel that is recognized by CDFG as a likely southwest-northeast wildlife travel corridor through the agricultural land uses that are dominant in the vicinity. This wildlife movement route provides foraging and potential breeding habitat for focal mammal species and raptors in the Coalinga area. Zapato Chino Creek connects to Los Gatos Creek approximately 1.7 miles north of West Jayne Avenue. The PVER is located approximately 2 miles northwest of the Project site, and is managed by CDFG. The PVER has historically supported SJKF, BNLL and western spadefoot toad, and is a continuation of the wildlife movement route near the Project area. Three of the key mammalian predators in central California were found near or are assumed to use the SJS 1&2 study area. Zapato Chino Creek is a likely functional wildlife movement route that supports wildlife and raptor foraging, roosting, and nesting habitats in the Project vicinity. The Project vicinity also functions as foraging habitat for raptors. Based on the large amount of land available for wildlife movement, implementation of the proposed Project is not anticipated to reduce the quality of existing wildlife movement routes adjacent to the project site.

3.6 POTENTIAL WATERS OF THE UNITED STATES/STATE JURISDICTIONAL WATERS

Zapato Chino Creek is a large natural drainage that meanders in a southwest to northeast direction in the San Joaquin Valley. It crosses the southern transmission line alternative in two locations and the northern transmission line alignment at West Jayne Avenue (Figure 2). A large bridge overpass is located approximately 1.5 miles east of the Project site on West Jayne Avenue that allows the creek to flow north under West Jayne Avenue until it eventually meets up with Los Gatos Creek. It becomes channelized near I-5, then becomes a distributional flow into a topographically flat agricultural area and the OHWM disappears before it reaches the California Aqueduct. The average width of the Zapato Chino Creek channel where it crosses the northern transmission line alternative is approximately 18 feet, and the average bank-to-bank width is approximately 121 feet (Figure 4A). The average width of the OHWM of the Creek within upper portion of the southern transmission line alternative is approximately 66 feet, and the banks average 203 feet (Figure 4B). Along the lower portion of the southern transmission alternative, the width of the OHWM averages 23 feet and the bank widths average 56 feet (Figure 4C).

The banks of the Creek in the northern transmission line alternative are dominated by upland vegetation such as scale broom (*Lepidospartum squamatum*) with cottonwood (*Populus fremontii*), mulefat (*Baccharis salicifolia*), and tamarisk (*Tamarix ramosissima*) becoming more prevalent near the bridge at Jayne Avenue. The creek channel becomes deeply cut, and riparian species are more dominant along the banks in the southern transmission line alternative. The channel bottom is non-vegetated for the majority of the creek and the soils are not hydrophytic. The channel was dry during the surveys in May through August 2008, as well as in January 2009; however, it is apparent that the channel supports heavy flow during large storm events. The Zapato Chino Creek has a well-defined bed and bank, but does not connect to a USACE-jurisdictional tributary or other waters of U.S. downstream after it confluences with Los Gatos Creek. Therefore, it is identified as a non-wetland waters of the State under the jurisdiction of CDFG and RWQCB. No wetlands or USACE-jurisdictional waters are present within the Project area.

SECTION 4 IMPACTS**4.1 IMPACTS**

Potential and expected direct and indirect impacts to biological resources are discussed below. Significant impacts are those that would involve the loss of a special-status plant or wildlife species, or degradation of their habitat. The Project would have significant impacts to vegetation and wildlife if it would:

- Cause a fish or wildlife population to drop below self-sustaining levels, California Environmental Quality Act (“CEQA”) Guidelines, Section 15065 (a).
- Threaten to eliminate a plant or animal community, CEQA Guidelines, Section 15065 (a).
- Substantially affect, reduce the number, or restrict the range of unique, rare, or endangered species of animal, plant, or the habitat of the species, CEQA Guidelines, Section 15065 (a), Appendix G (c), Appendix I (II.4.b) and (II.5.b).
- Substantially diminish or reduce habitat for fish, wildlife, or plants CEQA Guidelines, Section 15065 (a), Appendix G (t).
- Interfere substantially with the movement of resident or migratory fish or wildlife species, CEQA Guidelines, Appendix G (d).
- Change the diversity of species, or number of any species of plants (including trees, shrubs, grass crops, and aquatic plants) or animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, or insects), CEQA Guidelines, Appendix I (II.4.1) and (II.5.a).
- Introduce new species of plants or animals into an area, or act as a barrier to the normal replenishment of existing species, CEQA Guidelines, Appendix I (II.4.c) and (II.5.c).
- Deteriorate existing fish or wildlife habitat, CEQA Guidelines, Appendix I (II.5.d).
- Conflict with any regional Habitat Conservation Plans (HCP).

The above criteria are used to evaluate the proposed Project's impacts to plant communities and wildlife. The potential impacts associated with the construction and operations of the SJS 1&2 facility are discussed below.

4.1.1 Project Site

Loss of 640 acres of active intensive agricultural field will occur as a result of the proposed Project. The Project site has been actively cultivated for crops for several decades, as has the majority of surrounding area. The Project site was recently tilled and new crops were planted in the spring of this year; thus, it was observed that although the Project site is within the known range of BNLL, the site does not provide suitable habitat for BNLL. The Project site is suitable to provide pass-through and marginal foraging habitat for SJKF, American badger, and selected raptor species including golden eagle, barn owl, and loggerhead shrike. Loss of the 640 acres of actively cultivated land on the Project site that supports potential foraging for special-status species would be considered significant, but would be mitigated to less than significant with implementation of the recommended mitigation measures.

4.1.2 Transmission Line

The proposed transmission line routes would not result in significant impacts to biological resources because it would not cause impacts as listed above in Section 4.1.

Five special-status species were observed during the 2008 and 2009 surveys, or are known to occur along the transmission line routes. Four of the species are birds that are likely to use this area for foraging, and one species is a ground-dwelling mammal that was observed as roadkill on West Jayne Avenue. The proposed transmission line routes are also likely to support SJKF as foraging and pass-through habitat. One BNLL was detected near the southern route in 2008 during surveys of the CDFG-owned Pleasant Valley Preserve that is located adjacent the site and immediately north of the southern transmission line route; focused surveys of this route will be conducted in 2009 to determine if this one individual is still present within the transmission line route. If BNLL are detected, the pole locations near the CDFG reserve will be sited to avoid native vegetation, and monitoring would be conducted during construction of the project to preclude BNLL mortality.

The dry creek bed of Zapato-Chino Creek that crosses both routes is a wildlife movement route that likely supports foraging and nesting habitat for birds and several special-status wildlife species. Because the transmission line is expected to span the creek, no impacts to waters of the State are anticipated.

Impacts to the habitat located within the proposed transmission line routes are anticipated to be less than significant, as limited ground disturbance is associated with installation of the poles that support transmission lines. At this time it is not possible to determine the habitats that will be impacted by the installation of the transmission line poles because pole locations have not yet been determined. However, permanent disturbance areas would include a square approximately 50 feet by 50 feet (0.057 acre per pole) where transmission line pole pads will be located. Temporary impact area would be approximately 20 feet by 100 feet (0.046 acre per pole) for construction and erection of each pole, as well as for cable pulling. For the purposes of this estimate, it is assumed that there will be approximately 5 transmission line poles per linear mile, totaling approximately 25-30 poles (1.72 acres permanent impacts, 1.38 acres of temporary impacts). The poles will be situated so they span any sensitive habitats and the Zapato Chino Creek channel to preclude significant impacts to the creek and associated habitat.

Bird Collisions

Potential impacts to raptors and migratory birds from collisions with the proposed transmission lines are anticipated to be less than significant, as the SJS 1&2 Project site is not within an area that would concentrate migratory birds. Common, abundant local resident bird species would be most at risk of collision with the proposed structures. Because the SJS 1&2 Project site is not located near a large perennial waterbody, large numbers of susceptible waterfowl species are absent from the project vicinity. Based on previous studies (e.g., McCrary et al 1986, Koops 1987), a conservative estimate of between 10 and 430 birds (all bird species) per year could be killed from collisions with the proposed transmission line associated with the Project, or with buildings or other structures greater than 90 feet high. Use of FireFly bird flight diverters (Birdbusters website 2008), or similar devices placed on the transmission lines will make the structures more visible and minimize the risk of bird collisions.

Several studies on bird mortality from collisions with high-tension lines, buildings and windows, wind turbines, and vehicles are available. A brief summary of several studies that may be related to this project is provided below. Fatalities associated with buildings are usually the result of collisions with tall multi-story buildings that are lighted at night and collisions with reflecting windows at residential houses. USFWS estimates that 97.6 to 976 million bird deaths per year in the U.S. are due to collisions with building windows.

In the Netherlands, where approximately 2,875 miles (4,600 km) of high-tension lines are present, Koops (1987) estimated that approximately 750,000 to 1 million birds are killed annually by collisions based on an extrapolation made from three other Netherlands studies. Estimates in all three studies were in the same order of magnitude. The latter study estimated (unadjusted for scavenging and searcher efficiency) 113 fatalities per km of high tension line in grasslands, 58 fatalities per km of high tension line in agricultural lands, and 489 fatalities per km of high tension line near river crossings. The study used the mean estimate (adjusted for scavenging and searcher efficiency bias) of $750,000/2,875 = 261$ bird deaths/mile of high tension line. Extrapolating the mid-range of this estimate to the 500,000 miles (800,000 km) of bulk transmission lines in the United States would lead to a fatality estimate of approximately 130 million birds per year. Given the large, but unknown number of miles of power and other high tension lines in the U.S., and the lack of standardized data in the U.S., this estimate may be off by an order of magnitude or more in either direction (Erickson et al. 2005, Manville 2005).

Table 4.1-1
Comparison of Sources of Avian Mortality

Mortality Sources Compared—Erickson et al.

Table 2—Summary of predicted annual avian mortality.

Mortality source	Annual mortality estimate	Percent composition
Buildings ¹	550 million	58.2 percent
Power lines ²	130 million	13.7 percent
Cats ³	100 million	10.6 percent
Automobiles ⁴	80 million	8.5 percent
Pesticides ⁵	67 million	7.1 percent
Communications towers ⁶	4.5 million	0.5 percent
Wind turbines ⁷	28.5 thousand	<0.01 percent
Airplanes	25 thousand	<0.01 percent
Other sources (oil spills, oil seeps, fishing by-catch, etc.)	not calculated	not calculated

¹Mid-range of fatality estimates reported from Klem (1990), 1 – 10 bird fatalities per house, extrapolated to 100 million residences

²Based primarily on a study in the Netherlands (Koops 1987), extrapolated to 500,000 miles of bulk transmission line in U.S.

³One study in Wisconsin estimated 40 million (Coleman and Temple 1996), there are 60 million cats claimed as pets in the U.S.

⁴Based primarily on one study in England (Hudson 1965, Banks 1979) that estimated 15.1 fatalities/mile of road each year, no searcher efficiency or bias adjustments in that study, updated based on increase in vehicle registrations

⁵Conservative estimate using low range of empirical fatality rate (0.1 to 3.6 birds/acre), studies typically adjusted from searcher efficiency and scavenging

⁶Estimates from models derived by Manville and Evans (M. Manville, pers. comm.).

⁷Mid-range of per turbine and per MW estimates derived from empirical data collected at several wind projects (table 1).

4.1.2.1 *Temporary Impacts*

Temporary impacts to the habitat along the either transmission line route associated with construction will be returned back to the existing state once construction is finished. Transmission lines have a minimal impact on habitat and wildlife movement because there is limited ground disturbance, and transmission line poles also tend to create nesting habitat for raptors such as red-tailed hawk, golden eagle, raven and others. Because the total amount of habitat that will be impacted is approximately 3.2 acres, the permanent and temporary impacts are not considered significant. The transmission line and the poles that support the line are anticipated to span the creek and associated habitat; therefore, no significant impacts to the creek are anticipated.

4.1.3 Cumulative Effects

The cumulative impacts discussion for the proposed Project has several purposes:

- Identify past, present, and reasonably foreseeable actions within the Project vicinity that could affect the same resource(s) as SJS 1&2 site.
- Determine whether impacts of SJS 1&2 and the other actions would overlap in time or geographic extent.
- Determine whether the impacts of the proposed Project would interact with, or intensify the impacts of other actions.
- Determine whether this AFC overlaps another existing or planned AFC.
- Identify any potentially significant cumulative impacts.

The proposed Project and other projects in the vicinity are not expected to result in significant cumulative impacts to environmental resource areas, including, but not limited to, air quality, land use, cultural resources, water resources, or traffic during the construction or operation phases. All existing and proposed projects considered in this analysis can be characterized primarily as commercial development. Of the 19 projects with permit applications submitted, 7 are exploratory oil and gas well facilities and one natural gas pipeline. Of the remaining 11 projects, 4 include minor infrastructure projects related to the I-5/West Jayne Avenue interchange, and one is a cell tower. The remaining six projects include a tomato processing plant, a sand and gravel operation, and an electrical generation facility.

The closest permitted projects are located approximately 0.5-mile to the south of the Project site and includes exploratory oil and gas well and production facility sites. In addition, no permitted projects within 2.0-miles of the SJS 1&2 site include features that are likely to contribute to any direct and or indirect impacts caused by SJS 1&2. The tomato processing facilities projects, gravel and sand operation, and electrical generation facility are located at least 5 miles from the Project site. Thus, as mentioned above, no significant cumulative impacts have been identified as a result of the construction, operation, maintenance, or long-term presence of the Project and other projects in the area.

Potential cumulative impacts to biological resources caused by the construction of two solar hybrid power plants on the Project site will include loss of 640 acres of marginal habitat. Because the surrounding area is either disturbed grassland, disturbed Valley saltbush scrub habitat, or existing agricultural land uses, no

disruptions to wildlife movement are expected to occur. The primary wildlife movement route (Zapato-Chino Creek) will not be affected. In addition, because the proposed SJS 1&2 site is within a large area of disturbed habitat and is near a drainage with riparian habitat that acts as a functional wildlife movement corridor, cumulative impacts to special-status species including SJKF, American badger, and golden eagle would not be considered significant after implementation of recommended mitigation measures.

SECTION 5 MITIGATION AND MONITORING

This section identifies and describes recommended mitigation measures for the species-specific impacts previously identified in this section. In addition, several general mitigation measures and BMPs are also provided to potentially minimize potential indirect impacts that could affect site biological resources.

5.1 CONSTRUCTION MONITORING AND VEGETATION CLEARING

The following general mitigation measures and BMPs are proposed to minimize direct and indirect impacts caused by installation of the Project and the proposed transmission line.

Provide mitigation construction monitoring by a qualified biologist. The biologist will be given authority to execute the following functions:

- Conduct pre-construction surveys for sensitive species in impact areas.
- Establish construction exclusion zones and make recommendations for implementing erosion control measures in temporary impact areas.
- Provide worker environmental awareness training for all construction personnel that identifies sensitive biological resources and measures required to minimize Project impacts during construction.
- Prepare construction monitoring and compliance reports that analyze mitigation measure effectiveness.
- Vegetation clearing shall occur during the non-breeding bird season (September 1 to January 15).

5.2 FOCUSED MITIGATION*San Joaquin Kit Fox*

Mitigation for impacts to SJKF should be consistent with USFWS Recovery Plan for San Joaquin Valley Upland Species.

Impacts to 640 acres of marginal (SJKF) habitat (active agricultural field and approximately 3 acres of habitat associated with transmission line) are considered significant. SJKF use of the Project site appears to be limited to pass-through habitat and marginal foraging habitat. Proposed SJKF mitigation measures follow:

- Mitigate impacts to 643 acres of marginal SJKF foraging/pass-through habitat at a 1.1:1 ratio (708 acres of aglands or naturalized habitats supporting SJKF). This mitigation ratio is consistent with other CEC-permitted projects located on active agricultural lands within a landscape also dominated by agricultural lands. Mitigation can be accomplished through purchase of mitigation credits from a FWS/CDFG- approved mitigation bank for loss of SJKF habitat.
- Construction BMPs required by USFWS to avoid incidental take (harassment) of SJKF shall be implemented. These conditions are outlined below and must be printed on grading and building

plans. When implemented the measures will minimize take and reduce impacts to kit fox habitat to an insignificant level.

- Mitigate for loss of kit fox habitat either by:
 - Establishing a conservation easement on-site or off-site in a suitable Fresno County location and provide a non-wasting endowment for management and monitoring of the property in perpetuity;
 - Deposit funds into an approved in-lieu fee program;
 - Purchase credits in an approved conservation bank in Fresno County; or
 - Enter into a mitigation agreement with CDFG and provide a non-wasting endowment for management and monitoring of the terms of the agreement for perpetuity.
- Retain a qualified biologist to conduct a pre-construction survey of the Project site and conduct a pre-construction briefing for construction workers on kit fox biology and protection measures to be implemented.
- Include kit fox protection measures on project plans.
- Require a maximum 25 mph speed limit at the Project site during construction.
- Stop all construction activities at dusk.
- Cover excavations deeper than 2 feet at the end of each working day or provide escape ramps for kit fox.
- Inspect pipes, culverts or similar structures for kit fox before burying, capping, or moving.
- Remove food-related trash from Project site.
- If pesticides or herbicides are used, they must be used according to local, state, and federal regulations to prevent secondary poisoning of kit foxes.
- If a kit fox is discovered at any time in the Project area, all construction must stop and the CDFG and USFWS must be contacted.

Raptor Nest Sites and Migratory Bird Treaty Act

Impacts to large raptor species observed in the Project survey area (golden eagle, red tailed hawk, barn owl) are anticipated to be significant due to the permanent loss of 640 acres of raptor foraging habitat. Larger raptors will be less able to forage on site after project build-out; however, smaller raptors (e.g., American kestrel) will still be able to use the site. A total of 1.3 acres of temporary loss of raptor foraging habitat as a result of installation of the transmission line would be considered less than significant because of the minimal amount of impacts and because the habitat will be returned to its original land use that currently supports foraging for raptors. In addition, transmission line towers often provide habitat in the form of perching and nesting sites for raptors.

The potential for avian mortality as a result of collisions with buildings on the Project site and the proposed transmission line would be mitigated to less than significant by the use of FireFly bird flight

diverters, or similar devices, placed on the transmission lines to make the transmission lines more visible and minimize the risk of bird collisions.

Mitigation for loss of raptor foraging habitat will be provided through the compensatory mitigation acreage provided for SJKF mitigation. Additional BMP measures are also proposed:

- Pre-construction nest surveys of trees within the Project area during the non-breeding season.
- **If nests are detected, removal of nest trees must occur during the non-breeding season.**

SECTION 6 REFERENCES

- California Department of Fish and Game. 2008. Results of Resource Assessment Program 2005-2006 Surveys of the Pleasant Valley Ecological Reserve.
- California Native Plant Society (CNPS). 2005. Inventory of Rare and Endangered Plants (online edition, v6-05d). California Native Plant Society. Sacramento, CA. Accessed on Mon, Dec. 26, 2005 from <http://www.cnps.org/inventory>
- Erickson, Wallace P., Gregory D. Johnson, and David P. Young Jr. 2005. A Summary and Comparison of Bird Mortality from Anthropogenic Causes with an Emphasis on Collisions. Bird Conservation Implementation in the Americas: Proceedings 3rd International Partners in Flight Conference 2002, C.J. Ralph and T. D. Rich, Editors. U.S.D.A. Forest Service General Technical Report PSW-GTR-191, Pacific Southwest Research Station, Albany, CA: 1051-1064.
- Hickman, J. C. (ed.). 1993. The Jepson Manual. University of California Press, Berkeley, CA.
- Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency.
- Horn, G.H. 1885. Studies among the Meloidae. Transactions of the American Entomological Society 12:111 (as *Cantharis molesta*).
- Johnsgard, Paul A. 1990. North American Owls: Biology and Natural History. Washington D. C.: Smithsonian Institution Press.
- Jones & Stokes. 2007. East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan. Prepared for East Contra Costa County Habitat Conservation Plan Association.
- Kelsey, Rodd. 2008. Results of the Tricolored Blackbird 2008 Census. Audubon California, Landowner Stewardship Program. 43pp.
- Koops, F.B.J. 1987. Collision victims of high-tension lines in the Netherlands and effects of marking. KRMA Rep. 01282-MOB 86-3048. [Cited in Erickson et al. 2005 and Manville 2005].
- M.D. McCrary, R.L. McKernan, R.W. Schreiber, W.D. Wagner, and T.C. Sciarrotta. 1986. Avian Mortality at a Solar Energy power Plant. J. Field Ornithol. 57(2): 135-141.
- Manville, A.M., II. 2005. Bird strikes and electrocutions at power lines, communication towers, and wind turbines: state of the art and state of the science – next steps toward mitigation. Bird Conservation Implementation in the Americas: Proceedings 3rd International Partners in Flight Conference 2002, C.J. Ralph and T. D. Rich, Editors. U.S.D.A. Forest Service General Technical Report PSW-GTR-191, Pacific Southwest Research Station, Albany, CA: 1051-1064.
- Scott, T.A. 1985. Human impacts on the golden eagle population of San Diego County from 1928-1981. Master's thesis, San Diego State University, California. 100 pp.

- Shuford, W.D. and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento. Snow, C. 1973. Technical note: habitat management series for unique or endangered species: Report no. 7 golden eagle (*Aquila chrysaetos*). Bureau of Land Management, U.S. Department of the Interior. Denver Service Center, Denver, CO. 52 pp.
- Stebbins, Robert C. 2003. *A Field Guide to Western Reptiles and Amphibians*. 3rd Edition. Houghton Mifflin Company, 2003.
- U.S. Fish and Wildlife Service Website; Endangered Species Species Accounts.
[Http://www.fws.gov/sacramento/es/spp_info.htm](http://www.fws.gov/sacramento/es/spp_info.htm). Website accessed July 2008.
- Website for Bird Diverters: http://www.birdbusters.com/bird_flight_diverter.html. Website viewed in December 2008.
- Williams, Daniel F. 1986. Mammalian Species of Special Concern in California. Prepared for the state of California the resources agency department of fish and game. Department of Biological Sciences, California State University, Stanislaus. Originally published in 1986; Re-formatted October 4, 2007 from online version at:
http://www.dfg.ca.gov/hcpb/info/mammal_ssc.shtml

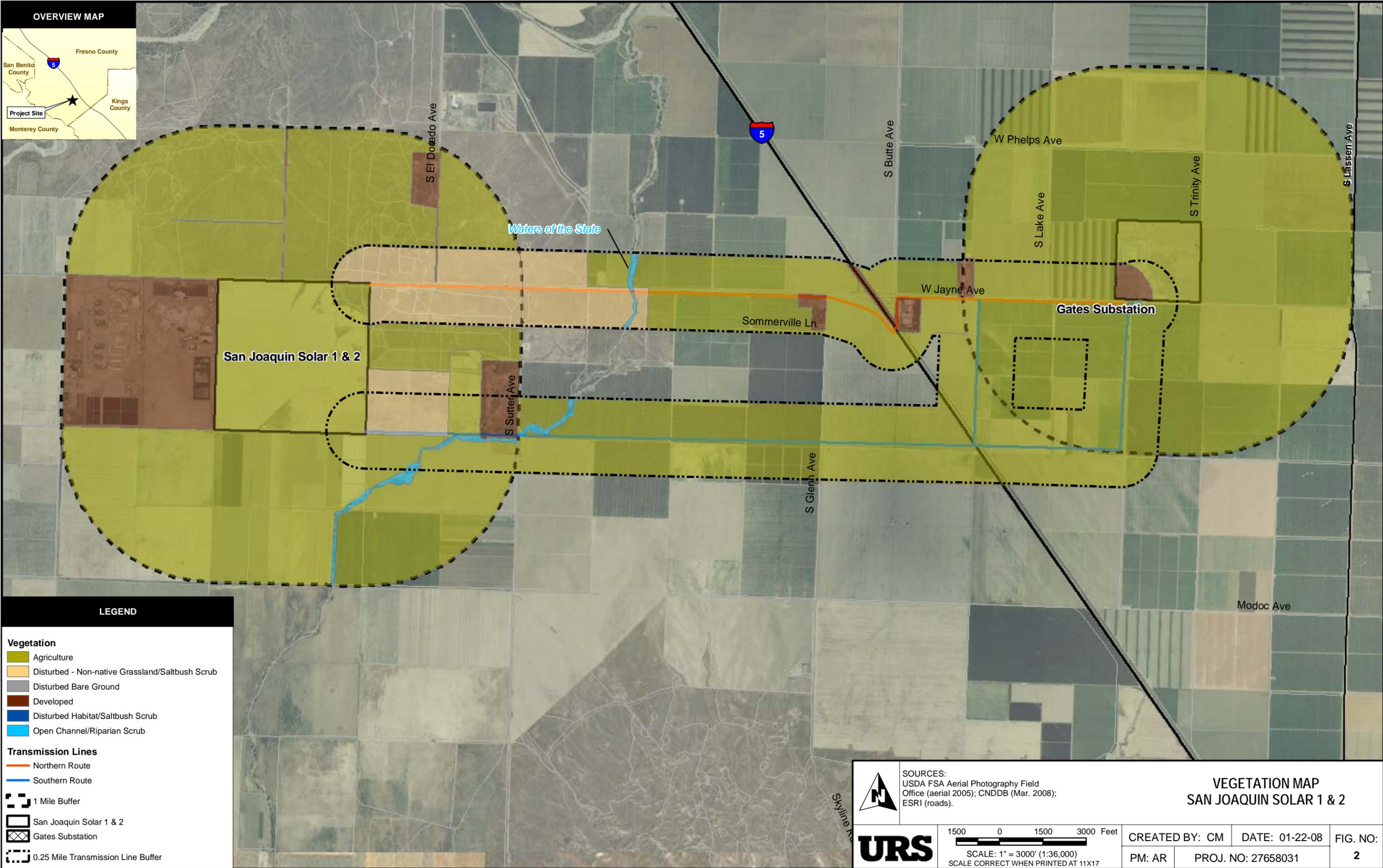
FIGURES



San Joaquin Solar 1 & 2

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	SOURCES: ESRI (background).		REGIONAL MAP SAN JOAQUIN SOLAR 1 & 2		
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LEGEND

Vegetation

- Agriculture
- Disturbed - Non-native Grassland/Saltbush Scrub
- Disturbed Bare Ground
- Developed
- Disturbed Habitat/Saltbush Scrub
- Open Channel/Riparian Scrub

Transmission Lines

- Northern Route
- Southern Route

1 Mile Buffer

San Joaquin Solar 1 & 2

Gates Substation

0.25 Mile Transmission Line Buffer



URS

SOURCES:
 USDA FSA Aerial Photography Field Office (aerial 2005); CNDDB (Mar. 2008); ESRI (roads).

**VEGETATION MAP
 SAN JOAQUIN SOLAR 1 & 2**

1500 0 1500 3000 Feet



SCALE: 1" = 3000' (1:36,000)
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California NAIP aerial imagery is freely distributed by The California Spatial Information Library (CaSIL). CaSIL, the California Resources Agency, and the State of California are 2005 California NAIP Imagery funding partners.



LEGEND

URS survey

- Blunt-nosed leopard lizard

CNDDDB 2008

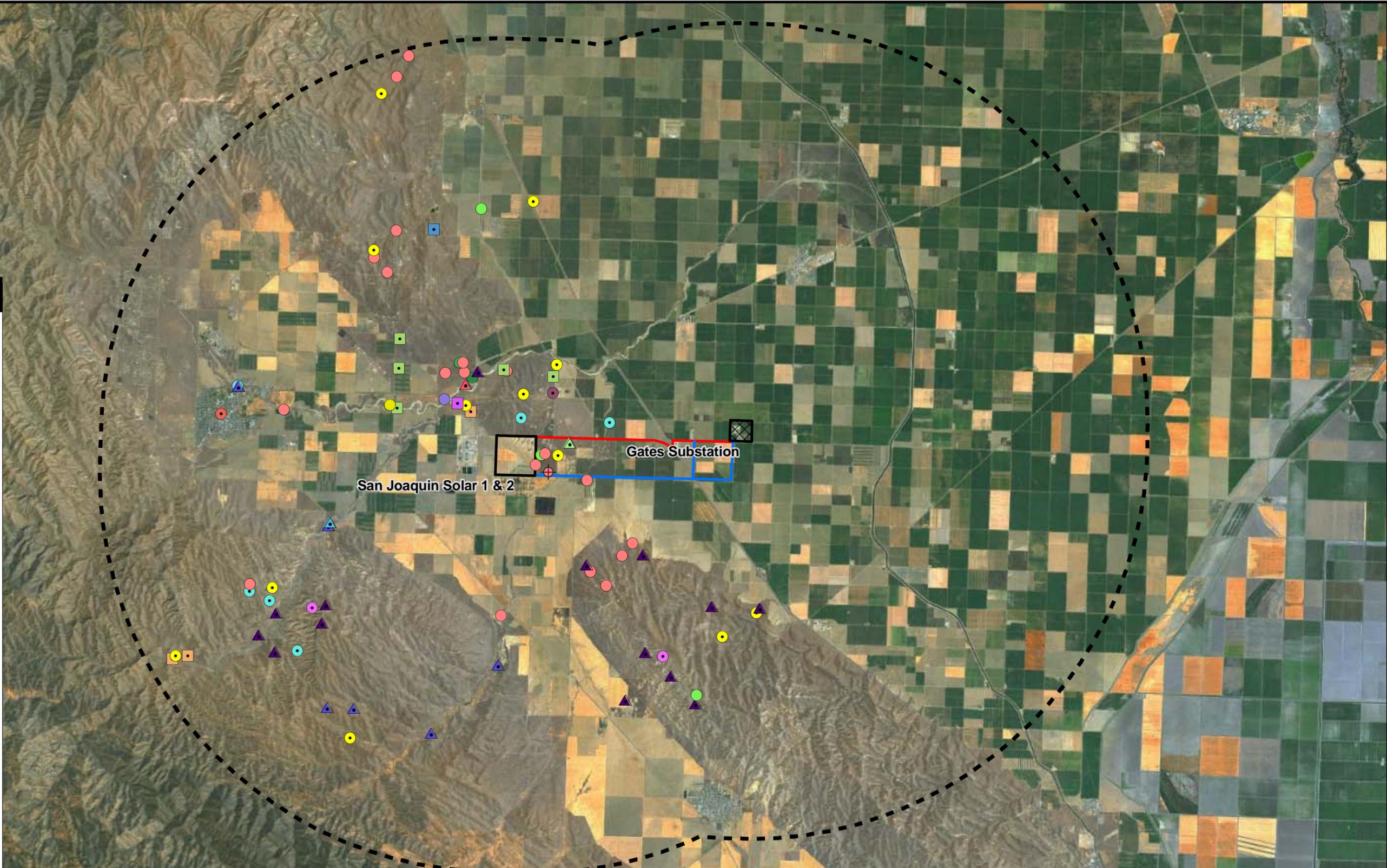
- American badger
- Burrowing owl
- Blunt-nosed leopard lizard
- Hopping's blister beetle
- Le Conte's thrasher
- Loggerhead shrike
- Long-eared owl
- Merlin falcon
- Molestan blister beetle
- Morrison's blister beetle
- Nelson's antelope squirrel
- San Joaquin dune beetle
- San Joaquin kit fox
- San Joaquin pocket mouse
- San Joaquin whipsnake
- Short-nosed kangaroo rat
- Silvery legless lizard
- Swainson's hawk
- Tricolored blackbird
- Tulare grasshopper mouse
- Western mastiff bat
- Western spadefoot
- Brittlescale
- California jewel-flower
- Great Valley Mesquite Scrub
- Hoover's eriastrum
- Lemmon's jewelflower
- Pale-yellow layia
- San Joaquin woollythreads

10 Mile Buffer

- San Joaquin Solar 1 & 2
- Gates Substation

Transmission Line

- Northern Route
- Southern Route



SOURCES:
USDA FSA Aerial Photography Field Office (aerial 2005); CNDDDB (Mar. 2008); ESRI (roads); CNDDDB (species, 2008); URS (species, 2008).

**SENSITIVE SPECIES LOCATIONS
10-MILE BUFFER
SAN JOAQUIN SOLAR**

UR S

1.25 0 1.25 2.5 Miles
SCALE: 1" = 2.5 Miles (1:158,400)
SCALE CORRECT WHEN PRINTED AT 11X17

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CNDDDB data points shown here are derived from a polygonal dataset, and are intended only as a guide to depict general presence of the identified species within the specified area. Contact CNDDDB for further information.

OVERVIEW MAP



14' - OHWM SOIL 3 - 1,2 122' - Bank to Bank

Soil 1 - 1,2 121' - Bank to Bank 27' - OHWM

W Jayne Ave

Soil 2 - 1,2 14' - OHWM

122' - Bank to Bank

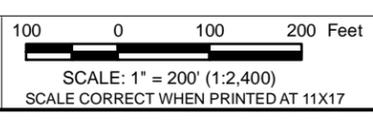
LEGEND

- ◆ Soil Sample location
- Waters of the State**
 - Bank
 - ▨ OHWM
 - ⋯ 0.25 Mile Transmission Line Buffer
- Transmission Lines**
 - Southern Route
 - Northern Route



SOURCES:
 USDA FAS Aerial Photography Field Office (aerial 2005); CNDDDB (Mar. 2008);
 ESRI (roads); URS (Waters of the State 2008).

JURISDICTIONAL WATERS
 SAN JOAQUIN SOLAR 1 & 2



CREATED BY CM	DATE: 01-20-09	FIG. NO:
PM: AR	PROJ. NO: 27658031	4A

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CNDDDB and USFWS data points shown here are derived from a polygonal dataset, and are intended only as a guide to depict general presence of the identified species within the specified area. Contact CNDDDB and USFWS for further information.

OVERVIEW MAP



LEGEND

- ◆ Soil Sample location
- Waters of the State**
- Bank
- OHWM
- 0.25 Mile Transmission Line Buffer
- Transmission Lines**
- Southern Route
- Northern Route

	SOURCES: USDA FAS Aerial Photography Field Office (aerial 2005); CNDDDB (Mar. 2008); ESRI (roads); URS (Vegetation 2008).		JURISDICTIONAL WATERS SAN JOAQUIN SOLAR 1 & 2	
		100 0 100 200 Feet 	CREATED BY CM DATE: 01-20-09	FIG. NO: 4B
SCALE: 1" = 200' (1:2,400) SCALE CORRECT WHEN PRINTED AT 11X17		PM: AR	PROJ. NO: 27658031	

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OVERVIEW MAP



LEGEND

- Soil Sample location
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	<p>SOURCES: USDA FAS Aerial Photography Field Office (aerial 2005); CNDDDB (Mar. 2008); ESRI (roads); URS (Vegetation 2008).</p>	<p>JURISDICTIONAL WATERS SAN JOAQUIN SOLAR 1 & 2</p>	
		<p>SCALE: 1" = 200' (1:2,400) SCALE CORRECT WHEN PRINTED AT 11X17</p>	<p>CREATED BY CM</p>
	<p>PM: AR</p>	<p>PROJ. NO: 27658031</p>	

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