

Appendix B: USFWS Biological Opinion



United States Department of the Interior



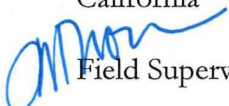
In Reply Refer to:
08ESMF00-
2015-F-0968

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

JUL 10 2017

Memorandum

To: Dave Hyatt, Supervisory Biologist, South-Central California Area Office, Fresno, California

From:  Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Formal Consultation on the San Luis Reservoir Solar Project, Merced County, California (Reclamation File Number SCC-422-ENV-7.00 San Luis Unit)

This letter is in response to the Bureau of Reclamation's (Reclamation) June 24, 2015 request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed San Luis Reservoir Solar Project (proposed project) in Merced County, California. Your request was received by the Service on June 29, 2015. At issue are the proposed project's effects on the federally endangered blunt-nosed leopard lizard (*Gambelia sila*) and San Joaquin kit fox (*Vulpes macrotis mutica*). This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The federal action on which we are consulting is the issuance of a land-use authorization, to HORUS Renewables Corporation (Applicant), to install, operate, and maintain above-ground solar panels on a Reclamation right-of-way. Pursuant to 50 CFR 402.12(j), you submitted a biological assessment for our review and requested concurrence with the findings presented therein. These findings conclude that the proposed project may affect, and is likely to adversely affect the San Joaquin kit fox. The findings also conclude that the proposed project may affect, but is not likely to adversely affect the blunt-nosed leopard lizard.

In considering your request, we based our evaluation on the following: (1) your June 24, 2015, letter requesting initiation of formal consultation; (2) the November 2015 revision of the *Biological Evaluation, San Luis Solar Project*, prepared by Reclamation (BE); (3) meetings and telephone calls attended by representatives of the Service, Reclamation, and the applicant, as well as electronic communications between these three parties; and (4) other information available to the Service.

You have determined that the proposed project may affect, but is not likely to adversely affect, the blunt-nosed leopard lizard. While the California Natural Diversity Database (CNDDB) describes a historical occurrence of the species partially overlapping the Action Area, the Service expects the blunt-nosed leopard lizard to be extirpated. Recent surveys failed to detect the species, and to our knowledge no observations of the species have been recorded since the original observation was made in 1931. The action area is outside of the species' currently known range. The applicant has agreed to implement avoidance measures, described in the *Conservation Measures* herein, to ensure avoidance of the species in case it eluded detection during surveys. For these reasons, we concur

with your determination that the action may affect, but is not likely to adversely affect the blunt-nosed leopard lizard.

The remainder of this document provides our biological opinion on the effects of the proposed project on the San Joaquin kit fox.

Consultation History

June 24, 2015:	Reclamation requested initiation of Informal Consultation with the Service, making “may affect, not likely to adversely affect”(NLAA) determinations for the San Joaquin kit fox and blunt-nosed leopard lizard.
August 20, 2015:	The Service requested further information and clarification, by phone and in writing, on the project description and the potential effects of the action on San Joaquin kit fox.
June 24, 2015 – April 14, 2016:	The Service evaluated Reclamation’s BE and requested information and clarifications from Reclamation on the BE.
March 23, 2016:	The Service and Reclamation agreed that the project may adversely affect the San Joaquin kit fox during a conference call.
April 14, 2016:	The Service sent a memo to Reclamation informing Reclamation that the Service did not concur with NLAA determinations for the San Joaquin kit fox and blunt-nosed leopard lizard.
June 16, 2016:	Reclamation initiated formal consultation with the Service.
June 16, 2016 – December 6, 2016:	The Service and Reclamation engaged in several telephone and email, communications regarding the adequacy of Reclamation’s proposed measures to minimize the effects of the action on the San Joaquin kit fox.

BIOLOGICAL OPINION

Description of the Action

Project Area

The San Luis Reservoir State Recreational Area (SRA) contains approximately 27,000 acres of lands and waters including San Luis Reservoir, O’Neill Forebay, Los Banos Creek Reservoir, and adjacent lands, located in Merced County. San Luis Reservoir and O’Neill Forebay lie north and south of State Route (SR) 152. The Los Banos Creek Reservoir is approximately 8 miles to the southeast of the San Luis Reservoir and the O’Neill Forebay, and outside of the project area. Developed areas include a water storage and delivery system; however much of the area is open and undeveloped.

The proposed project includes the construction of three independent solar generation arrays at three separate locations in the SRA, as depicted on Figure 1, as well as aerial generation interconnection transmission (gen-tie) lines that will link the sites with the existing O’Neill Substation. Final placement of arrays and other components within these locations will be based on constraints at

those locations, including topography and biological considerations. The arrays are anticipated to take between 6 to 9 months to install.

The maximum construction footprint of the project consists of the boundaries of Sites 1, 2, and 3; the gen-tie corridor (70 kilovolt [kV] poles and lines centered within a 75-foot easement); a battery energy storage system, and a four-person waterless restroom; potential temporary staging areas; and potential spoils pile relocation areas. Together, these areas will cover a maximum of 237 acres. Acreages of specific project components are provided in Table 1, and components are discussed further in the following sections. Placement of PV systems and other components within each site accounts for constraints including topography, hydrology, and biological considerations.

Table 1 Project Components and Acreages

Project Component	Number and acreage of Components	Temporary Habitat Loss (acres)	Permanent Habitat Loss (acres)
Gen-tie corridor	6.2 linear miles (56.4 ac (including 75-foot-wide easement))	56.4	0.008
Staging areas	Up to 5 potential (up to 15.2 ac total)	15.2	0
Spoils pile relocation areas	2 potential (5.7 ac total)	5.7	0
Solar PV system sites	3 -- Site 1: 98 ac Site 2: 14 ac Site 3: 47 ac	159 (Site 1: 98 + Site 2: 14 + Site 3: 47)	See "Within solar PV system sites" below
Battery energy storage system	1	Up to 0.7	Up to 0.7
Waterless restroom	1	<0.1	<0.1
<i>Within solar PV system sites</i>			
Roads (improved and new; assumed 20 feet wide)	Site 1: 15,363 linear feet (lf; 7.1 ac) Site 2: 3,236 lf (1.5 ac) Site 3: 6,748 lf (3.1 ac)	(Included in 159 ac listed above)	11.7 (Site 1: 7.1 + Site 2: 1.5 + Site 3: 3.1)
Substations	2 — Site 1: 0.2 ac Site 2: 0.5 ac	(Included in 159 ac listed above)	0.7 (Site 1: 0.2 + Site 2: 0.5)
Combining switchgear	1 (Site 3; <0.1 ac)	(Included in 159 ac listed above)	<0.1
Control buildings	2 (Sites 1 and 2; <0.1 ac)	(Included in 159 ac listed above)	<0.1
Solar PV panels	Site 1: 66,840 (32.2 ac) — Site 2: 7,440 (3.6 ac) Site 3: 28,080 (13.7 ac)	(Included in 159 ac listed above)	0.034 (total for Sites 1, 2, and 3)
Power conversion units	17 (0.27 ac)	(Included in 159 ac listed above)	0.27
TOTAL	-	237	13.61



Proposed Project

The proposed project is entirely on Federal lands and will consist of the three separate solar PV system sites containing solar panels, racks to hold the panels, and electrical infrastructure. The electrical infrastructure will consist of cabling, DC to AC power conversion units with medium voltage transformers, and medium voltage (34.5 kV) underground lines. Each site will have access roads, fencing, lighting, and security systems. Other project components include combining switchgear, control buildings, meteorological stations, and substations (34.5 kV/70 kV), depending on the site. Gen-tie lines (70 kV) will connect each site to the existing O'Neill Substation. In addition, a battery energy storage system (BESS) will be included as part of the project to help the Applicant better deliver energy at a controlled and more constant level. A waterless restroom would also be constructed for future State Parks use.

Solar PV Systems

The project will use approximately 102,360 high-efficiency, commercially available PV solar panels. The panels will be tempered for impact resistance and use anti-reflective glass, which is less reflective than standard residential and commercial glass. At each site, the solar PV panels will be mounted on steel brackets to a horizontal single-axis tracking system, a moving rack that tilts the panels to track the sun in an east-west direction throughout the day and seasons. Each tracker unit will consist of 16 rows with 40 solar PV panels each. The maximum height of the solar PV panels when mounted on the tracking system will be less than 7.5 feet.

A number of electrical connections are needed to convey and convert power collected by the solar panels to the electrical grid. The PV panels will be connected by wire harnesses as part of the tracking system assembly. Combiner boxes collect DC power from the wire harnesses of several rows of panels and convey it through underground cables to power conversion units. The power conversion units convert the DC input into grid-quality AC output, and a transformer within the unit then “steps up” the voltage. The power conversion units consist of outdoor inverter and transformer equipment mounted directly on poured or pre-cast concrete pads/foundations.

Specific details about each site are provided below.

Site 1

This is the southernmost solar PV system. It will be constructed on approximately 98 acres of land in the Medeiros Use Area (see Figure 2). The solar PV system will occupy 32.2 acres, while the remaining acreage will be used for roads, spacing between rows to avoid shading overlap from the solar panels, power conversion units, detention basins, and a new substation. In order for California State Parks to implement their San Luis Reservoir State Recreation Area Final Resource Management Plan / General Plan and Final Environmental Impact Statement / Environmental Impact Report (Reclamation 2013), and in accordance with the management agreement (14-06-200-4353A), there will be a 50-foot setback (10 acres) from the access road for future recreation development. The project will include no development in this buffer area except for provision of landscaping, a waterless restroom, and realignment of a short (625-foot) road connection to the existing camping area to the north of Site 1.

The Site 1 PV system will contain approximately 66,840 solar PV panels with a capacity of approximately 305 watts each, with a total of 11 power conversion units projected. Medium-voltage underground lines (placed in conduits or directly buried approximately 36 inches below ground surface) will convey the output of the power conversion units to a new on-site substation. The substation will step up the voltage from the PV system from 34.5 kV to 70 kV for transmission to the existing O'Neill Substation. The total power output is projected to be approximately 16.5 MW AC.

Site 2

Site 2 will be built on approximately 14 acres of land just south of the canal intake to the O'Neill Pumping-Generating Plant and west of the Delta-Mendota Canal. Approximately 3.6 acres will be occupied by solar panels, with the remaining acreage used for roads, spacing between rows to avoid shading overlap from the solar panels, power conversion units, detention basins, and a new substation. Site 2 is anticipated to have 7,440 solar panels with a capacity of approximately 305 watts each, one power conversion unit, and a total power output of 2 MW AC.

As with Site 1, medium-voltage underground lines will convey the output of the power conversion unit to a new on-site substation. The substation will step up the voltage from the PV system from 34.5 kV to 70 kV for transmission to the existing O'Neill Substation.

Site 3

Site 3, the northernmost solar PV system, will be built on approximately 47 acres of land just north of the canal intake to the O'Neill Pumping-Generating Plant. Approximately 13.7 acres will be occupied by solar panels, with the remaining acreage used for roads, spacing between rows to avoid shading overlap from the solar panels, power conversion units, detention basins, and combining switchgear. Site 3 is anticipated to have 28,080 solar panels with a capacity of approximately 305 watts each, five power conversion units, and a total power output of 7.5 MW AC.

Medium-voltage underground lines will be placed approximately 36 inches below ground surface to convey the output of the power conversion units to combining switchgear, where the energy output from each conversion unit will be bundled.

The Site 3 switchgear will be connected via a 34.5 kV overhead line to the substation at Site 2, and a 70 kV overhead line will connect the Site 2 substation to the existing O'Neill Substation. At the O'Neill Substation, the voltage will be stepped up for transmission.

Site 3 also contains an existing spoils pile of approximately 70,000 cubic yards that the San Luis and Delta-Mendota Water Authority (SLDMWA) uses for operations and maintenance (O&M) of its facilities. SLDMWA has access rights to Sites 2 and 3 as part of its O&M of the Delta-Mendota Canal. As part of the project, the spoils pile will be moved from its current location along the northern side of Site 3 to one or both of two possible locations to the west of Site 3 for continued SLDMWA use.

Gen-ties

Overhead 70 kV gen-tie lines will connect each site to the existing O'Neill Substation. The lines will be suspended from wooden power poles approximately 70 feet high and 50 inches in circumference. The distance between the poles will generally be approximately 150 feet. The gen-tie corridor will be up to 75 feet wide to accommodate line swing and provide adequate clearance from trees and structures.

The gen-tie line corridor will begin at the southeastern edge of the Site 1 substation and generally parallel the north side of SR 152 and the west side of SR 33. Just south of the Delta-Mendota Canal crossing of SR 33, the gen-tie line will shift northwest and then north, following the southern and then western side of the Delta-Mendota Canal. At Site 2, the gen-tie will connect with the project substation (which will also serve Site 3) and then veer west, staying to the south of the canal connecting to O'Neill Dam, and finally connecting with the existing O'Neill Substation.

Roads

Graded all-weather roads will be constructed along a perimeter fence to facilitate movement of equipment and materials from the staging areas to the work areas. The roads will be 20 feet wide and covered with 6 inches of crushed rock. The roads will be permanent, allowing for long term operation and maintenance (O&M) activities over the life of the project.

Site Security, Fencing, and Lighting

Sites 1, 2, and 3 will be fenced to facilitate project and equipment security, and surveillance methods such as security cameras, motion detectors, or heat sensors may be installed at locations along the site boundaries. Gates will be installed at the roads entering or exiting the sites. The site perimeters will be fenced with an approximately 8-foot-tall chain-link fence. For Site 1, along the recreational area on the shore of O'Neill Forebay, the fence will be equipped with privacy slats in a color that matches or complements the surrounding environment. The perimeter fences will include appropriate features to allow San Joaquin kit fox and other wildlife movement in and out of the facility, as described in the *Conservation Measures*. In addition, video surveillance of Site 1 will include the designated shoreline camping and day use areas of Medeiros to the west and north of the solar PV system.

Shielded area-specific lighting for security purposes will be limited to the control buildings, Sites 1 and 2 substations, and Site 3 combining switchgear. The level and intensity of lighting will be the minimum needed for security and safety purposes. These lights will be down-shielded and turned on either by a local switch as needed, or by motion sensors that will be triggered by movement at a human's height during maintenance or emergency activities. There will be no lights around the site perimeters in order to minimize the project's visual impact. Sensors on the security fencing will alert security personnel of possible intruders.

Power Plant and Monitoring Facilities

A project substation measuring approximately 125 feet long by 60 feet wide and approximately 10 feet high will be constructed at Site 1. A second project substation measuring approximately 160 feet long by 140 feet wide and approximately 10 feet high will be constructed at Site 2. Both buildings are likely to be prefabricated, and will sit on concrete slabs on-grade. At the project

substations, the voltage of the solar PV system will be stepped up to 70 kV, which is the voltage of the gen-tie line that will interconnect Site 1 with the O'Neill Substation. The proposed substations will be constructed, owned, operated, and maintained by the Applicant and would be commissioned by Western Power Administration.

At Site 3, the combining switchgear unit will measure approximately 70 feet long by 40 feet wide and approximately 10 feet high. It will also be set on a concrete slab on-grade.

Sites 1 and 2 will each have a monitoring and control facility (hereafter control building containing plant security systems and project monitoring, control, and remote communication equipment. The locations of the control buildings have yet to be determined, but will be within the fenced boundaries of Sites 1 and 2. Each control building will consist of a 15-foot-wide by 20-foot-long prefabricated building set on a concrete slab on-grade. The buildings will be a maximum height of approximately 12 feet.

Energy Storage Facilities

As part of the project, a BESS will be constructed to provide dispatchable energy under various operating conditions. The ability to store energy will improve the project's operability and enhance the integration of as-available solar energy into the transmission network by offering additional ramp rate control and more consistent energy flows.

The BESS will be constructed as a modular system, the footprint of which will be up to 0.4 acre. The facility will be located at the western edge of Site 2 or 3 and will not be accessible to the public.

State Parks Restroom

The Applicant will construct a four-person waterless restroom to support planned future camping development at Medeiros Use Area by State Parks. The restroom will be constructed to the north of the Site 1 fenceline and within the recreation buffer, in the vicinity of the new road connection from O'Donohugh Road West. Ownership, operation, and maintenance of the restroom will be the responsibility of State Parks, as part of their management of recreational facilities at San Luis Reservoir SRA.

The facility is anticipated to be a prefabricated unit of approximately 22 feet in length, 13 feet in width, and 11 feet in height. A total of four 1-foot-diameter vent pipes will extend approximately 2 feet above the roof.

The facility will be constructed on a concrete slab, requiring excavation to a depth of approximately 2 feet. An underground vault of impermeable polyethylene or similar material will also be installed below each restroom stall—four vaults in total—and have approximately 750-gallon capacity. The vaults will require approximately 5 vertical feet of ground disturbance. Waste from the restroom will be pumped out of the vaults, hauled away, and disposed of by an appropriately licensed firm.

Construction

Construction of the project will occur in two basic phases: (1) construction mobilization and (2) construction and installation of the solar modules, electrical components, and gen-tie lines. Construction mobilization will consist of preconstruction surveys; mobilization of personnel and

equipment (including construction of access roads, and installation of trailers, laydown, and materials storage areas); and site preparation, including drainage system development. After construction mobilization, construction of the PV systems and gen-tie lines will begin. Construction of Site 1 will take approximately 130 days. Sites 2 and 3 will each take approximately 100 days to construct and may be constructed concurrently with Site 1.

Access

Site 1 will be accessed from the Medeiros entry road (Donohugh Road West) via SR 33. Sites 2 and 3 will be accessed be from SR 33 via McCabe Road.

The perimeters of each site will be fenced and gated to limit public access as described previously.

Construction Vehicles, Equipment, Timeframes

Most construction work schedules will be from 7:00 AM to 5:00 PM, Monday through Friday, in order to comply with Merced County Code Section 18.41.070. Nighttime construction work is not planned; however, some weekend work may be necessary.

Most construction equipment/vehicles will be brought to the project at the beginning of the construction process. Project construction traffic will include construction commuting vehicles, periodic truck deliveries of materials and supplies, trash removal, and other off-site truck shipments.

Surveying and Staking

Surveying is performed to meet two main objectives: 1) obtaining detailed topographic information for supporting the storm water modeling and grading design, and 2) construction layout surveying with staking. The final Site Plans for the project will be based on a detailed topographic survey of the site.

Road corridors, buried electrical lines, PV system locations, and the locations of other facilities will be located and staked in order to guide construction activities. Pre-construction survey work will consist of staking and flagging the following: 1) construction area boundaries, 2) work areas (permanent and short term), 3) micrograding or discing, 4) access and roads, 5) transmission structure centers, 6) foundation structure, and 7) any offsets or buffer areas for utility corridors or sensitive environmental resources. Staking and flagging will be maintained until final cleanup.

Site Preparation, Clearing, Grading, and Compaction

Preconstruction activities include installation of perimeter fencing and surveys described in the *Conservation Measures*. Once these activities occur, the Applicant will begin to mobilize for construction. Construction mobilization includes preparing and constructing site access roads, establishing temporary construction trailers, and preparing construction staging areas.

The project area includes one or more temporary construction staging areas, including parking areas and construction offices. Up to five potential staging areas have been identified with a total area of approximately 15 acres. Gravel and/or water will be applied as necessary to reduce dust emissions. After construction has been completed, the staging areas will be decommissioned and restored to approximate original site conditions, including revegetation.

Site Preparation

The Applicant will use the results of the field testing to adjust site preparation and construction methods to minimize impacts to vegetation and facilitate site restoration.

1. Vegetation Treatment/Clearing and Grading

Vegetation will be cleared from the solar PV system areas, access roads, and concrete pad/foundation locations for power conversion units, combining switchgear, control buildings, and substations. Vegetation will also be cleared for construction of the detention basins, including berms.

Vegetation will be disced under, mulched, or composted, and retained on site to assist in erosion control and limit waste disposal. Where grading is necessary outside of solar PV systems and access roads, native vegetation may be harvested for replanting to augment soil stabilization.

Solar PV system areas will be prepared using conventional farming equipment including tractors with discing equipment and vibratory rollers, with limited use of scrapers to perform micrograding within sections of the solar PV system field. The site will be contour graded level using rubber-tired farming tractors towing discing equipment to disc the top 5 to 7 inches of soil. A water truck will follow closely alongside the tractor to moisten the soil in order to control dust. A drum roller will then be used to flatten the surface and return the soil to a compaction level similar to the preconstruction stage.

Lastly, scrapers will be used for micrograding where necessary to ensure a level field. Disturbed areas that are not covered in aggregate or concrete will be hydroseeded or reseeded by other methods with an approved grass mix.

Additional minor earthwork will also be needed for trenching for electrical conduits within Sites 1, 2, and 3. The trenched soils are anticipated to be backfilled.

As part of site preparation, a spoils pile of approximately 70,000 cubic yards will be moved from its current location along the northern side of Site 3 to one or both of two possible locations to the west of Site 3. The spoils pile is used by SLDMWA for O&M purposes.

Any remaining slopes will be 3:1 or flatter, unless otherwise noted.

2. Compaction

Soil will be compacted to allow heavy equipment to move across the site. The ground will be compacted to achieve a density of at least 90 percent of the soil's maximum dry density as determined by the modified proctor compaction test (ASTM D 1557).

3. Erosion Control and Storm Water Drainage

The project design includes several protective erosion and drainage control measures including silt fences along the northern, western, and southwestern boundaries of Site 1, and around the entire boundaries of Sites 2 and 3; stabilized construction entrances at each site;

designated vehicle and equipment cleaning/concrete washout areas at each site; and dust control and hydroseeding or other reseeding within each site.

Detention basins will be constructed at each site to contain direct runoff from each site. Offsite flow patterns will be maintained, and the project is not expected to affect flow patterns on the surrounding properties.

Solar PV System Assembly and Construction

1. PV Infrastructure

Vertical steel support piles spaced approximately 10 feet apart center-to-center will be driven into the ground to an approximate depth of 7 to 10 feet below grade. The module framing assemblies, or racks, will then be attached to the support posts. The PV modules will be manually secured to the racks. Wiring harnesses will be used to electrically connect several rows of racks to a combiner box that will deliver power to power conversion units.

Trenches will be excavated for the underground AC and DC cabling, and the foundations for the power conversion unit enclosures and transformers will be prepared. Trenches will be approximately 3 feet wide and 4 feet deep. In general, each site will have one trench for medium-voltage cables connecting to the power conversion units and switchgear, and eight to twelve trenches for DC cables, depending on the total power installed at each site. Electrical cables will be laid in the trenches and combiner boxes will also be installed. The underground cables will connect the power conversion units to the substations at Sites 1 and 3 and the combining switchgear at Site 3. The trenched areas will be backfilled filled once the cables are buried.

The power conversion units will consist of outdoor inverters and transformers mounted directly on poured or pre-cast concrete pads/foundations. They will be installed at predetermined central locations within each PV system and then connected to incoming lines from the combiner boxes. After the units are installed in a particular area, traffic is expected to be limited to infrequent low-impact traffic in the aisles between PV blocks for inspection, maintenance, and repair purposes.

2. Gen-tie Construction

A gen-tie alignment consisting of overhead 70 kV lines suspended on wooden poles will be constructed to connect each site to the existing O'Neill Substation. The wooden poles will be approximately 70 feet high and 50 inches in circumference. The distance between the poles will generally be approximately 150 feet. The gen-tie corridor will be up to 75 feet wide to accommodate line swing and provide adequate clearance from trees and structures.

The poles will be set in the ground to a depth of 7 to 10 feet. The poles will be installed with a rubber-tired flatbed truck and truck-mounted drills and cranes that will access each locale via existing roads or by minimally driving cross country. Similar equipment will be used for connecting the lines to the poles.

3. Waste and Hazardous Materials

During project construction, typical construction wastes, such as wood, concrete, and miscellaneous packaging materials, will be produced and will be disposed of in accordance with local, State, and Federal regulations.

Portable toilets will be used during construction, and waste will be regularly pumped out, hauled away, and disposed of by appropriately licensed organizations.

Hazardous materials used during project construction will consist of diesel fuel, gasoline, motor oils, and hydraulic fluids and lube oils for vehicles and equipment; soil stabilizers for roads and solar PV array areas; and biodegradable mineral oil for transformers. Appropriate spill containment and clean-up kits will be kept on site during construction and maintained during project operation.

4. Construction Noise

Maximum noise levels during construction will range from 75 to 85 A-weighted decibels at a distance of 50 feet. Most construction will take place during daytime hours, Monday through Friday. Nighttime construction work is not planned; however, some weekend work may be necessary.

Operations and Maintenance

Once construction is completed, the project will be in operation for at least 30 years. The following activities will take place as part of project O&M.

1. Construction Workforce and Maintenance Activities

After the construction period, the workforce for operations, maintenance, and security purposes is estimated to be three to five part-time workers. Typical work schedules are expected to be during daylight hours only, with the exception of 24-hour remote security and some limited maintenance work required after dark when PV modules are not producing energy.

Daily vehicle trips during project operation are expected to consist of one employee vehicle and one delivery vehicle (both roundtrips). Hazardous materials used during project operation will be limited to diesel fuel, gasoline, and motor oil from vehicles, biodegradable mineral oils from transformers, and lithium-ion batteries from the BESS.

Maintenance of the project will require occasional visual inspections, equipment servicing, and minor repairs. Project maintenance activities will generally include all-weather road maintenance, vegetation management, as well as scheduled maintenance and occasional replacement of electrical equipment. The project's all-weather access roads will be regularly inspected, and any degradation due to weather or wear and tear will be repaired. The Applicant will apply dust control measures on dirt access roads as needed.

2. Vegetation Maintenance

The solar PV system sites will be hydroseeded or reseeded by other methods with an approved grass mix. Access roads and aisles will be maintained to allow passage by maintenance vehicles and personnel. Areas covered by panels will be allowed to passively revegetate. Areas between the solar PV panels will be mowed or weed whacked to allow annual grassland species to recolonize the sites.

3. Panel Washing and Other Water Use

The solar panels will be washed with softened and de-ionized water, typically twice per year. Panel washing activities will require one gallon per panel per year. Assuming the Proposed Action will include 108,000 solar panels, the panel washing activities will require up to 120,000 gallons of water per year. Wash water will be supplied by contractors from an off-site location by trucks.

During project initiation and operation, water for landscaping establishment and maintenance at Site 1 will be acquired and trucked in by an outside provider.

The ground surface below the solar panels will be pervious, allowing any residual water from panel washing and erosion control activities to be absorbed into the topsoil before percolating into the deeper subsurface soils.

During project operations, no full-time personnel will be on-site, and as such, no permanent or temporary restroom facilities are proposed within the solar PV sites.

Decommissioning

For purposes of this consultation, decommissioning is not considered part of the Proposed Action. If the Applicant wishes to decommission the project, the Applicant will seek the appropriate incidental take exemptions for decommissioning activities prior to commencing decommissioning of the project.

Conservation Measures

The following measures have been incorporated into the design of the project to avoid and minimize the effects of the action on the San Joaquin kit fox and blunt-nosed leopard lizard (Listed Species):

1. To reduce effects on Listed Species, the project has been designed so that construction will occur primarily in areas that are currently or have in the recent past been disturbed and therefore are least suitable as habitat for the Listed Species.
2. Security fences installed on the perimeter of the project site will be designed to enable passage of San Joaquin kit foxes and their prey, while impeding the passage of larger predators of kit foxes, such as coyotes and larger domestic dogs. All fencing will leave a 4- to 8-inch opening between the fence mesh and the ground. The bottom of the fence material shall be knuckled (wrapped back to form a smooth edge) to protect wildlife that

pass under the fence. Fences will be monitored regularly to ensure that any damage or vandalism is quickly repaired.

3. Areas between the solar arrays (aisles) will be managed (e.g., mowed or weed whacked) to allow annual grassland species and prey species to recolonize the project site and to maintain a wildlife corridor through the action area.
4. Exterior lighting shall have the following restrictions:
 - a. Narrow spectrum bulbs will be used to limit the effects of lighting on federally-listed species.
 - b. All lighting shall be designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated, and so that backscatter to the nighttime sky is **minimized**. The design of the lighting shall be such that the luminescence or light sources are shielded to prevent light trespass outside the project boundary and neither the lamp nor the reflector interior surface will be visible from outside the footprint of the facilities.
 - c. Light fixtures shall be installed on poles of minimal height or be installed on the buildings.
 - d. All lighting shall be of minimum necessary brightness consistent with worker safety.
 - e. The number of lighting fixtures shall be limited to the minimum required to meet safety needs or requirements.
 - f. All illuminated areas not occupied on a continuous basis shall have switches or motion detectors to light the area only when it is occupied. Any perimeter lighting shall also only be motion activated.
 - g. All lighting poles, fixtures, and hoods shall be of dark-colored material.
 - h. Operational exterior lighting shall be limited to the control buildings, Sites 1 and 2 substations, and Site 3 combining switchgear, unless other exterior lighting is required by law or code.
 - i. Unless determined necessary by Reclamation for safety or security reasons, any signs at the entry of the project site shall not be lit (reflective coating is acceptable). Lighting will be used from dusk to dawn for the project substation to conform to National Electrical Safety Code requirements and all applicable outdoor lighting codes.

The following general **minimization** and avoidance measures will be implemented during all project activities to **minimize** incidental take of the San Joaquin kit fox:

1. All employees, consultants, and contractors shall receive environmental training prior to the commencement of construction activities. The avoidance and **minimization** measures will be outlined in the training. All personnel on the construction site will follow these measures

to avoid or reduce effects on Listed Species. The training will include a printed handout (printed in both English and Spanish) that will be handed to all personnel. All employees and contractors will be required to sign a register indicating that they attended the training and understand the material presented. The handout will contain the following information:

- a. Descriptions of the San Joaquin kit fox and blunt-nosed leopard lizards (including photographs) and their habitat needs.
 - b. A current report of the occurrences of the San Joaquin kit fox and blunt-nosed leopard lizard in the Action Area.
 - c. An explanation of the protected status of both species under the Federal Endangered Species Acts and legal obligations.
 - d. Avoidance and minimization measures that will be followed to reduce impacts on the both species during all construction and O&M activities, and the penalties for not following the avoidance and mitigation measures.
 - e. Instructions on the procedures that will be implemented if a federally-listed species is found onsite, including contact information of a biological monitor and Service personnel.
2. At least 30 days prior to the onset of ground-disturbing activities, the name(s) and credentials of a Supervisory Project Biologist(s) responsible for approving and overseeing all project biological monitors and other site trained monitors performing biological work will be submitted to the Service for approval.
 3. Biological monitor(s) approved by the Supervisory Project Biologist will be required onsite as long as construction crews and vehicles are accessing the site. Monitoring will cease once construction traffic and activity has ceased and the site is operable.
 4. Biological monitors will have the authority to order a halt to construction activities, and will order halts to construction activities in the following instances: 1) the monitor observes activities that may result in mortality or harm to federally-listed species; 2) the monitor observes any of these *Conservation Measures* not being implemented; or 3) if at any time a covered or federally-listed species is in danger of experiencing mortality or harm. Work shall not resume until the situation has been rectified to the satisfaction of the Supervisory Project Biologist. If a biological monitor orders a halt to construction activities, he or she shall immediately contact the Supervisory Project Biologist for further instructions.
 5. All construction-related activities will occur within designated work areas.
 6. All construction activities will terminate 30 minutes before sunset and will not resume until 30 minutes after sunrise, except as described below. Sunrise and sunset times are established by the U.S. Naval Observatory Astronomical Applications Department for the geographic area where the project is located. Some discrete maintenance activities must occur when the facility is not generating power (i.e., at night). Those activities will be conducted under the guidance of a qualified biologist. Some O&M activities must occur when the solar site is

powered down, which may also occur at night. Those activities which must occur at night are to be authorized by the Supervisory Project Biologist.

7. To prevent inadvertent entrapment of San Joaquin kit foxes or other animals during the construction phase of the project, all excavated, steep-walled holes or trenches more than 2 feet deep shall be covered at the close of each working day by plywood or similar materials. Any covers that are installed will be able to be removed quickly by construction staff should the need arise. If covers require heavy equipment to lift them, some means of inspecting the inside of the hole shall be installed (e.g., Plexiglas windows) so that biological monitors can ensure no animals are trapped inside. Holes and trenches less than 2 feet deep may either be covered or be provided with escape ramps at a rate of one ramp every 100 feet. Escape ramps may be constructed of earth fill or wooden planks with a slope no steeper than 45 degrees. If wooden planks are used, perpendicular grooves or rungs shall be provided to aid in traction. All holes and trenches, whether covered or uncovered, more than 2 feet deep shall be inspected prior to the start of the construction day, around midday, and at the end of each construction day as they are being covered for the night. These inspections shall occur whether or not work is occurring in that area. Before holes or trenches are filled, they shall be thoroughly inspected for trapped animals. Work shall not continue until trapped animals have moved out of or are removed from the open trench and relocated to a location approved by the Service.
8. Speed limits within the project site will be limited to 15 miles per hour during the day and 10 miles per hour at night. All project-related vehicles and equipment will be restricted to established roads, construction areas, and designated staging areas.
9. Food-related trash will be disposed of in closed containers and removed from the project site at least once daily.
10. No pets or firearms will be permitted on the project site.
11. Within 1 working day of finding a dead, sick, or injured federally-listed species on the project site, the biologist will immediately notify the Service verbally, and within 3 working days in writing. Notification in writing will include the date, time, and location where the specimen was found and information about the conditions under which it was found.
12. A map of the location of all observations of listed species observed during preconstruction surveys and during monitoring will be prepared and submitted to the Service prior to the commencement of any ground-disturbing activities. This information will be submitted to the CNDDDB.
13. A Revegetation Plan will be prepared for the project. Upon completion of the project, all areas temporarily subject to ground disturbance, including staging areas, will be revegetated according to the project Revegetation Plan. The plan will be submitted to the Service for approval prior to its implementation. Revegetation will begin immediately following construction.
14. The solar panels shall be constructed in a layout that is consolidated to the extent feasible.

15. No rodenticides or insecticides will be used within the project site during construction, or subsequent operations and maintenance of the project. Herbicide application is permitted, but shall be limited to areas where mowing is not possible (e.g., around buildings and against poles and infrastructure).

The following avoidance and minimization measures will be implemented during construction and O&M to minimize potential incidental take of individual federally-listed species:

San Joaquin Kit Fox

1. The guidelines described in Service (2011), or the most recent version of these guidelines, will be implemented. The applicant will inquire with the Service yearly to obtain the most recent guidelines.
2. As described in Service (2011), a preconstruction survey will be conducted no less than 14 days and no more than 30 days before the beginning of ground disturbance, or any activity likely to affect San Joaquin kit fox, such as mowing. The biologists will conduct den searches by systematically walking transects through the project site and a buffer area to be determined in coordination with the Service. Transect distance will be based on the height of vegetation such that 100% visual coverage of the project site is achieved. If a potential or known den is found during the survey, the biologist will measure the size of the den, evaluate the shape of the den entrances, and note tracks, scat, prey remains, and recent excavations at the den site. Dens will be classified into the den status categories defined by the Service (Service 2011). In the event that Service (2011) is revised or updated, the most recent approved version of the guidance will be used.
3. A report of the preconstruction survey will be submitted to the Service and Reclamation for review.
4. If potential den sites are located they will be monitored by a biologist approved by the Service. The biologist will use an infrared beam camera and track plates or powder, to determine if the den is currently being used. The camera and track plates will be placed at the burrow for a minimum of 5 consecutive days. Other signs of occupancy (e.g., scat, fur) will be searched for in and around the burrow and, if found, documented with photographs.
5. San Joaquin kit fox are attracted to den-like structures such as stored pipes. All construction pipes, culverts, or similar structures with a 4-inch or greater diameter that are stored at the construction site for one or more overnight periods shall be closed off at both ends and thoroughly inspected before they are buried, capped, or otherwise used or moved in any way. If a kit fox is discovered in a pipe, that section of pipe shall not be moved until the kit fox is allowed to leave unimpeded or the Service has provided alternative guidance.
6. All materials staged on the project site, and especially in staging areas, shall be stored so as to not provide areas suitable for San Joaquin kit foxes to seek shelter. At no time shall materials be haphazardly piled on the project sites. All materials shall be inspected thoroughly by the biological monitor prior to being moved.
7. Construction activities will be prohibited within exclusion zones around suitable burrows, based on their type. If any San Joaquin kit fox dens or potential dens are found during

preconstruction surveys, the status of the dens shall be evaluated prior to project ground disturbance. The configuration of exclusion zones around San Joaquin kit fox dens should have the radius measured outward from the entrance or cluster of entrances, as follows.

- a. *Potential den*: a 50-foot avoidance buffer will be used when kit fox occupation is expected but not confirmed.
 - b. *Known den*: a 100-foot avoidance buffer will be used if kit fox activity is observed.
 - c. *Natal/pupping den*: work must immediately cease and the Service must be contacted to approve an avoidance plan prior to commencing or continuing any construction-related work.
8. The Applicant will install artificial escape dens along the outside edge of the solar arrays (outside of the fencing) only if potential dens have been identified during preconstruction survey. The escape dens will be placed at a minimum every 1/8-mile along the transmission corridors length. The escape dens should be of similar design as those presented in Harrison et al. (2011).
 9. Rodenticide and pesticide use is prohibited. Herbicide application will be limited to areas where mowing is not possible (e.g., around buildings and against poles and other infrastructure).

Measures to Avoid Incidental Take of Blunt-Nosed Leopard Lizards

1. During the active season for blunt-nosed leopard lizards, (generally starting April 15, but any time of year with temperatures of 77 degrees Fahrenheit (F) as measured 2 centimeters above the ground), prior to any planned ground-disturbing construction, O&M, or decommissioning activities, a biologist with experience in surveying for blunt-nosed leopard lizard shall assess site conditions for supporting the species.
 - a. If site conditions are determined to be suitable for blunt-nosed leopard lizard at that time, then presence/absence surveys for the species shall be conducted within and adjacent to the proposed area of ground disturbance. Surveys shall be conducted according to the most recent California Department of Fish and Wildlife protocol.
2. If a blunt-nosed leopard lizard is encountered during these surveys, all work will immediately cease, the location of the observation will be marked, and the Service and Reclamation will be contacted. A report of the preconstruction survey will be submitted to the Service and Reclamation for review and approval.
3. No ground-disturbing maintenance activities shall occur in or adjacent to areas where blunt-nosed leopard lizard has been detected until incidental take authorization has been obtained through reinitiation of Section 7 consultation with the Service.
4. No monofilament plastic or soil strengthening agents, geo fabrics, and dust suppression products that would adversely affect these species will be used for erosion control. Only natural fiber, biodegradable meshes shall be used in erosion control mats, blankets, and

straw or fiber wattles, and these features shall be installed in such a way as to prevent entrapment of blunt-nosed leopard lizards.

Optimal activity temperatures for blunt-nosed leopard lizards are between 77F – 95F measured 1-2 centimeters above the ground over the surface of a project site (CDFW 2004). Between April 1 and September 30, mowing will occur when the animals are underground and temperatures are below 75F, measured 1- centimeter above the ground in the sun. Alternatively, protocol surveys may be performed within the project area, and if no blunt-nosed leopard lizards are detected, mowing may be performed.

Action Area

The action area is defined in 50 CFR § 402.02, as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” For the proposed project, the action area is the 237-acre area encompassed by the boundaries of Sites 1, 2, and 3; the gen-tie corridor (70 kilovolt [kV] poles and lines centered within a 75-foot easement); the battery energy storage system, and a four-person waterless restroom; potential temporary staging areas; and potential spoils pile relocation areas.

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. “Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed Federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

Status of the Species

San Joaquin Kit Fox

For the most recent comprehensive assessment of the species’ range-wide status, please refer to the *San Joaquin kit fox (Vulpes macrotis mutica) 5-Year Review: Summary and Evaluation* (Service 2010). No change in the species’ listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2010 5-year review was finalized, with loss of grassland and desert habitat being the most significant effect. While there have been continued losses of grassland habitat throughout the

regions identified in the Recovery Plan for Upland Species of the San Joaquin Valley, California (Service 1998), to date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species.

Environmental Baseline

General Conditions

The three solar PV sites have been previously cleared of vegetation and leveled following the use of the areas as quarries for base material to develop the San Luis Reservoir and O'Neill Forebay or ancillary support, access, and conveyance structures. This is evidenced by the steep slopes cut from the surrounding terrain and the unnaturally flat remaining contours at the three locations. The sites are fairly level, with slopes of ~0.3 percent at Site 1, ~0.4 percent at Site 2, and 0.0 percent at Site 3. The sites have, over time and likely as part of the reclamation plan, been revegetated primarily with ruderal and/or grass species. The gen-tie alignment and staging areas have also been previously cleared of vegetation during the construction of the existing electric transmission towers/lines, the development of SR 152 and SR 33, or the construction of the water conveyance system. The three solar PV sites have been disked, and the gen-tie corridor has been tilled.

The primary cover at each of the sites, the gen-tie alignment, and the staging areas is Nonnative Annual Grassland, as described in Holland (1986). This community is dominated by various nonnative grasses and ruderal species such as wild oats (*Avena* spp.), brome (*Bromus* spp.), mustard (*Brassica* spp.), hare barley (*Hordeum murinum* ssp. *leporinum*), Italian ryegrass (*Lolium multiflorum*), wild radish (*Rapahnus sativus*), bedstraw (*Galium* sp.), black mustard (*Brassica nigra*), yellow star thistle (*Centaurea solstitialis*), purple star thistle (*Centaurea calcitrapa*), bur clover (*Medicago polymorpha*), red stemmed filaree (*Erodium cicutarium*), clover (*Trifolium* sp.), sweetclover (*Melilotus* spp.), cheese weed (*Malva parviflora*), rattail fescue (*Vulpia myuros*), and barnyard grass (*Echinochloa crus-galli*). Native forbs occur at low density and include fiddleneck (*Amsinckia menziesii*), blow wives (*Achyrochaena mollis*), red maids (*Calandrinia ciliata*), and vinegar weed (*Trichostema lanceolatum*). This type of Nonnative Annual Grassland is not the preferred habitat for blunt-nosed leopard lizards or San Joaquin kit fox due to the height and density of the vegetation.

The density of cover for the majority of the three solar PV sites is estimated to be 75 to 100 percent with a few sparser areas of 60 to 75 percentage cover, except where the sites have been recently disturbed. Portions of the Nonnative Annual Grassland in the study area are disturbed and show signs of vegetative management by mechanical means, as evidenced by toothed furrow remnants from disking activities. This is especially evident on Sites 2 and 3, where disking appears to have been conducted within the past 1 to 2 years. Most of the vegetation within the gen-tie corridor along SR 33 has been previously disked or plowed, with some areas showing remnants of past agricultural plantings.

Disturbed and recontoured areas are also scattered throughout the project area. These areas generally consist of active, developed roads, road shoulders, parking lots, and areas that were predominantly paved, rock, and gravel. The roads and parking lots have been scraped in the past and are highly disturbed. Vegetation in these areas is typically absent, although sparse cover of weedy species such as English plantain (*Plantago lanceolata*), filarees, prickly lettuce (*Lactuca serriola*), oats, soft brome (*Bromus hordeaceus*), and ryegrass may be present. Some native plants may also occur such as tarweed (*Holocarpha* spp.), common gum plant (*Grindelia camporum*), and foothill plantain (*Plantago erecta*).

Current human disturbances in the action area include moderate levels of vehicle and human vegetation trampling/damage, non-natural erosion from trail pioneering, and littering associated primarily with recreational activities at the O'Neill Forebay. The action area also exhibits impacts from the existing utility corridors (i.e., overhead power transmission lines and gas pipelines), O'Neill Pumping-Generating Plant, numerous concrete-lined and unlined canals for water conveyance, and associated access roads.

San Joaquin Kit Fox

There are several CNDDDB records for San Joaquin kit fox within 10 miles of the action area, and the species is known to be extant at the Agua Fria Conservation Bank approximately 3.5 miles to the south of the action area, south of Highway 152. The action area was surveyed in 2014–2015 and burrows were assessed for evidence of San Joaquin kit fox use such as dirt mounding, scat, prey remains, and matted vegetation. No evidence of kit fox use was observed. The grassland within Site 1 and along the gen-tie corridor was observed to support ground squirrels and pocket gophers, and thus provide a prey base for kit fox.

Surveys

Special-status species habitat evaluations of the action area were conducted on February 28, 2014, March 7, 2014, April 9, 2014, May 15, 2014, May 30, 2014, June 4, 2014, June 13–14, 2014, September 25, 2014, November 17, 2014, January 21, 2015 and March 23, 2015 by ESR, Inc. Detailed information about vegetation as it relates to special-status species habitat is provided below.

The surveyors primarily focused on the three solar PV sites and gen-tie corridor, but also assessed some adjacent or nearby areas for suitability of use by special-status species including the blunt-nosed leopard lizard and the San Joaquin kit fox. The surveyors walked parallel transects spaced at 30-meter intervals across the three solar PV sites multiple times on several dates. The gen-tie route was assessed in a zigzag pattern along the length and width of the corridor. Additional information about species-specific survey methods is provided below.

Each potential burrow location was assessed for adequate entrance size for San Joaquin kit fox use. Adequate burrow entrances are from 20 to 25 centimeters (5 to 10 inches) in diameter and normally higher than wide and/or with ramp-shaped mounds of dirt from 1 to 2 meters (3 to 6 feet) long deposited at the entrances. If no ramp-shaped mound was observed, the burrows were assessed as to whether the dirt was more scattered into a long tailing ramp with a runway down the middle instead of a mound of dirt in front of the opening. Hillside burrows were also assessed. The entrance of each burrow was assessed for evidence of use, such as scat, prey remains, and matted vegetation, etc. Taller grass was occasionally encountered. In areas of taller grass, matted grass in front of the entrance was also used as an indicator of potential use.

The San Joaquin kit fox was not detected during any of these surveys. Due to the presence of habitat consistent with the needs of the species within the action area, and known populations of the species surrounding the action area, the Service has determined that the action area contains habitat for the San Joaquin kit fox, and considers the action area to be used by the species for feeding, movement, and dispersal. While not observed, it is possible that portions of the action area are usable by the species for denning.

North-South Movement Corridor

The action area lies within a movement corridor for San Joaquin kit fox along the west side of the San Joaquin Valley (Service 1998), between the Santa Nella satellite population of the San Joaquin kit fox, and the northern satellite population, roughly located in western San Joaquin County and eastern Contra Costa Counties. Maintaining potential movement corridors for the San Joaquin kit fox, especially from south to north in the Santa Nella area, is one of the upland species recovery planning objectives for this species (Service 1998). Habitat in the vicinity of the action area is highly fragmented by water infrastructure development such as lakes and canals; roadways, urbanization, and agricultural development.

Effects of the Action

The San Joaquin kit fox may use habitat in the action area for movement, denning, foraging, or sheltering, even though these activities were not detected in specific sets of surveys. The Proposed Action has been designed to utilize areas that have been previously disturbed, and therefore provide the least suitable habitat for the species. Permanent and temporary direct effects to habitat for the San Joaquin kit fox are expected to occur as a result of project construction, as well as project operations and maintenance.

During construction mobilization, vegetation will be removed or flattened by construction vehicle travel to and from work areas, and vehicle and equipment movement at each solar PV site associated with construction or improvement of access roads, grading and compaction, vegetation removal, construction of detention basins, and (at Site 3 only) relocation of the spoils pile.

During construction/installation of the solar PV sites, vegetation could be removed or flattened by vehicle and equipment movement at each site associated with installation of fences, gates, and steel support piles for the solar PV racks; trenching for electrical connections; and construction of concrete pads/foundations. During construction/installation of the gen-tie line, vegetation will be removed or flattened by vehicle and equipment movement associated with pole and line installation.

If San Joaquin kit foxes are present within the action area after the preconstruction surveys and/or during the construction activities, they may be subject to harassment by exposure to construction noise. Injury or mortality may occur as a result of vehicle strikes, excavation or other grading activities. Undetected individuals existing within dens may be entombed by grading activities. Individuals entering the action area during construction may become trapped in open trenches, or be injured falling into them.

San Joaquin kit foxes may occupy the site after construction has been completed, and operation and maintenance of the project has commenced. Any individuals inhabiting the site during this time may experience harassment or harm resulting from vegetation management activities. Such effects include harassment due to noise from mechanical equipment, reduction in prey due to death in mechanical equipment or reduction in habitat quality for prey, or injury to individuals as a result of operating mechanical equipment such as mowers. San Joaquin kit foxes may be harassed as a result of operations and maintenance personnel entering/leaving the site, or by panel washing. San Joaquin kit foxes may avoid areas, such as those around the substations, that will be illuminated at night by security lighting. Fencing that shall be installed to allow San Joaquin kit fox passage, while excluding predators, may benefit the species by reducing competition for prey and other resources within the action area and by reducing predation of the San Joaquin kit fox.

The Service notes that construction of this project is expected to increase habitat fragmentation for this species within a landscape that has already been severely fragmented by the construction of the California Aqueduct, Delta-Mendota Canal, San Luis Reservoir, their associated canals and infrastructure; as well as the city of Santa Nella and associated suburban sprawl, highway 152 and interstate 5, and conversion of large tracts of land to incompatible agricultural use. Increased fragmentation is expected to further reduce the ability of the San Joaquin kit fox to utilize the north-south movement corridor to connect the Santa Nella satellite population with the northern satellite population in San Joaquin and Contra Costa counties. As such, this project is expected to further impede achievement of the stated recovery goal of maintaining a movement corridor between these populations.

As noted previously in the Description of the Action section, the project proponent has also proposed a set of *Conservation Measures*. The *Conservation Measures* are expected to minimize injury and mortality of the San Joaquin kit fox. Injury or mortality are unlikely, but may occur if the species is undetected and struck by equipment during any phase of the project, or if animals fall into trenches or holes during construction.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. During this consultation, the Service did not identify any future non-federal actions that are reasonably certain to occur in the action area of the proposed project.

Conclusion

After reviewing the current status of the San Joaquin kit fox, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the San Luis Reservoir Solar Project, as proposed, is not likely to jeopardize the continued existence of the San Joaquin kit fox. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following: (1) the effects of habitat fragmentation are expected to be minimized by project design features, such as fences that allow movement of San Joaquin kit foxes through the solar sites, and are not expected to appreciably reduce the ability of the species to use the North-South Movement Corridor between Santa Nella and Southwestern San Joaquin County; and (2) Conservation Measures described in the description of the proposed action are expected to minimize incidental take of the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding,

feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Bureau of Reclamation so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Bureau of Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If the Bureau of Reclamation (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Bureau of Reclamation must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

San Joaquin Kit Fox

The Service anticipates that incidental take of San Joaquin kit fox will be difficult to quantify because the number of individuals utilizing the action area is unknown. While estimates of population density in the action area are unavailable, the Service believes, based on surveys performed and lack of recent detections of the species north of Highway 152, that the species exists at a low population density within and around the action area. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities, the permanent and temporary loss/degradation of suitable habitat; however, proper implementation of avoidance measures should be effective in minimizing incidental take. Therefore, the Service anticipates take incidental to the proposed action as the harassment of all San Joaquin kit fox within the 237-acre action area. Additionally, the Service anticipates that a total of one (1) San Joaquin kit fox may be injured or killed within the action area throughout the life of the project.

Upon implementation of the following reasonable and prudent measures, incidental take of San Joaquin kit fox associated with the San Luis Reservoir Solar Project will become exempt from the prohibitions described in section 9 of the Act. No other forms of take are exempted under this opinion.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the San Joaquin kit fox resulting from implementation of this project have been incorporated into the project's proposed conservation measures. Therefore, the Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the San Joaquin kit fox:

1. All *Conservation Measures*, as described in the biological assessment and restated here in the *Description of the Action* section of this biological opinion, shall be fully implemented and adhered to during all phases of the project, including during operation and maintenance post-construction. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Applicant and the Bureau of Reclamation must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

2. The Bureau of Reclamation shall include full implementation and adherence to the *Conservation Measures* as a condition of any permit, contract, or lease issued for the project.
3. The Applicant shall require that all personnel associated with this project are made aware of the *Conservation Measures* and the responsibility to implement them fully.
4. In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, the Applicant and Reclamation shall adhere to the following reporting requirements. Should this anticipated amount or extent of incidental take be exceeded, Caltrans must immediately reinitiate formal consultation as per 50 CFR 402.16.
 - a. The Applicant and the Bureau of Reclamation shall immediately contact the Service's Sacramento Fish and Wildlife Office (SFWO) at (916) 414-6600 to report direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harassment, harm, injury, or death occurs. If the encounter occurs after normal working hours, the Applicant or the Bureau of Reclamation shall contact the SFWO at the earliest possible opportunity the next working day. When injured or killed individuals of the listed species are found, the Bureau of Reclamation shall follow the steps outlined in the Salvage and Disposition of Individuals section below.

Salvage and Disposition of Individuals:

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the

disposition of the dead specimen. The Service contact person is the San Joaquin Valley Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at (916) 414-6600.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to **minimize** or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

1. The Bureau of Reclamation should work with its San Luis Reservoir land management partners to seek and facilitate grazing opportunities on San Luis Reservoir State Recreation Area lands covered under Reclamation's Resource Management Plan. Prior to authorizing grazing, Reclamation should develop an appropriate grazing management plan in coordination with the Service.

In order for the Service to be kept informed of actions **minimizing** or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the San Luis Reservoir Solar Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and:

- (a) If the amount or extent of taking specified in the incidental take statement is exceeded;
- (b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- (c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or
- (d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Dana Herman (dana_herman@fws.gov), staff biologist, or Patricia Cole (patricia_cole@fws.gov), at the letterhead address or at (916) 414-6683 (Dana Herman) or (916) 414-6678 (Patricia Cole), or both.

Literature Cited

[CDFW] California Department of Fish and Wildlife (Formerly California Department of Fish and Game). 2004. Blunt-nosed leopard lizard survey protocol. Revised May 2004. California Department of Fish and Game. Fresno, California.

Harrison, S.W.R., B.L. Cypher, and S. E. Phillips. 2011. Enhancement of satellite and linkage habitats to promote survival, movement, and colonization by San Joaquin kit foxes. BLM, South-Central CA. Area office. Fresno, CA. Agreement No. 07FG200141. January 18, 2011.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. California Dept. Fish and Game, Sacramento, 156 pp.

[Reclamation] (Bureau of Reclamation). 2013. San Luis Reservoir State Recreation Area Final Resource Management Plan / General Plan and Final Environmental Impact Statement / Environmental Impact Report. Department of the Interior Bureau of Reclamation Mid-Pacific Region -Planning Division. June 2013.

[Service] U.S. Fish and Wildlife Service. 2011. Standardized Recommendation for Protection of the Endangered San Joaquin Kit Fox Prior To Or During Ground Disturbance. Sacramento, California.

_____. 2010. San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation. Sacramento, California.

_____. 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. Region 1, Portland, Oregon.