

APPENDICES

APPENDICES

APPENDIX A

Applicant: Terrance Wolosek, Plover, WI; PRT-60798A

The applicant requests a permit to import a sport-hunted trophy of one male bontebok (*Damaliscus pygargus pygargus*) culled from a captive herd maintained under the management program of the Republic of South Africa, for the purpose of enhancement of the survival of the species.

Brenda Tapia,

Program Analyst/Data Administrator, Branch of Permits, Division of Management Authority.

[FR Doc. 2011-32876 Filed 12-22-11; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[FWS-R8-ES-2011-N240; FF08ESMF00-FXES1112080000F2-123]

Draft Environmental Impact Statement and Proposed Maricopa Sun Solar Complex Multi-Species Habitat Conservation Plan, Kern County, CA

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of intent; announcement of public scoping meetings; request for comments.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), intend to prepare a draft environmental impact statement (EIS) under the National Environmental Policy Act for the proposed Maricopa Sun Solar Complex Habitat Conservation Plan (HCP) under development by Maricopa Sun, LLC. The draft EIS will evaluate the impacts of several alternatives related to the HCP being proposed by Maricopa Sun, LLC in support of its anticipated application for an Endangered Species Act permit for incidental take of five federally endangered species (one reptile and four mammal species) and 14 California special status species (one amphibian species, three reptile species, six avian species, and four mammal species) from activities associated with the construction, operation, and decommissioning of a 700 megawatt photo-voltaic power generating facility and implementation of conservation actions associated with the HCP in Kern County, California. We also announce plans for a public scoping meeting and the opening of a public comment period. We request data, comments, new information, or suggestions from the public, other concerned governmental agencies, the scientific community,

Tribes, industry, or any other interested party.

DATES: A public scoping meeting will be held to solicit comments from interested parties to assist in determining the scope of the environmental analysis, including the alternatives to be addressed, and to identify significant environmental issues related to the Proposed Action. The scoping meeting date and location are:

- Monday, January 23, 2012 from 1–3 p.m.
- Kern County Public Services Building, 2700 M Street Conference Room 1–A, Bakersfield, CA 93301.

To ensure consideration, please send your written comments by close of business February 21, 2012.

ADDRESSES: To request further information or submit written comments, please use one of the following methods, and note that your information request or comment is in reference to the Maricopa Sun Solar Complex Habitat Conservation Plan.

- *U.S. Mail:* 2800 Cottage Way, Room W-2605, Sacramento, California 95825-1846.
- *In-Person Drop-off, Viewing, or Pickup:* Call (916) 414-6600 to make an appointment during regular business hours to drop off comments or view received comments at the above location.
- *Fax:* Justin Sloan or Mike Thomas, (916) 414-6713, Attn.: Maricopa Sun Solar Complex Habitat Conservation Plan.

FOR FURTHER INFORMATION CONTACT: Justin Sloan, Senior Fish and Wildlife Biologist, (916) 414-6600 (phone) or Mike Thomas, Chief, Habitat Conservation Planning Division, (916) 414-6678 (phone). If you use a telecommunications device for the deaf, please call the Federal Information Relay Service at (800) 877-8339.

SUPPLEMENTARY INFORMATION: We, the U.S. Fish and Wildlife Service (Service), publish this notice under the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 *et seq.*; NEPA), and its implementing regulations in the Code of Federal Regulations (CFR) at 40 CFR 1506.6, as well as in compliance with section 10(c) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*; Act). We intend to prepare a draft EIS to evaluate the impacts of several alternatives related to the potential issuance of an incidental take permit (ITP) to the applicant, as well as impacts of the implementation of the supporting HCP.

The applicant proposes to develop an HCP as part of their application for an

ITP under section 10(a)(1)(B) of the Act. The proposed HCP will include measures necessary to minimize and mitigate the impacts, to the maximum extent practicable, of potential proposed taking of federally listed and non-listed species to be covered by the HCP, and the habitats upon which they depend, resulting from construction, operation, and decommissioning of a 700 megawatt photo-voltaic power generating facility and implementation of conservation actions associated with the HCP in Kern County, California.

The project is a proposed 700 megawatt solar power facility within a proposed planning area covering approximately 6,766 acres in the southwest portion of unincorporated Kern County, California. Multiple parcels comprise the project, which are approximately six to 20 miles east of Taft along South Lake Road and along Copus Road. The individual sites can be accessed from Interstate 5, South Lake Road and Copus Road, and several other access roads.

Background

Section 9 of the Act prohibits taking of fish and wildlife species listed as endangered or threatened under section 4 of the Act. Under the Act, the term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The term “harm” is defined in the regulations as including significant habitat modification or degradation that results in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). The term “harass” is defined in the regulations as to carry out actions that create the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3).

However, under specified circumstances, the Service may issue permits that allow the take of federally listed wildlife species, provided that the take that occurs is incidental to, but not the purpose of, an otherwise lawful activity. Regulations governing permits for endangered and threatened species are at 50 CFR 17.22 and 17.32, respectively.

Section 10(a)(1)(B) of the Act contains provisions for issuing incidental take permits to non-Federal entities for the take of endangered and threatened wildlife species, provided the following criteria are met:

1. The taking will be incidental;

2. The applicants will, to the maximum extent practicable, minimize and mitigate the impact of such taking;

3. The applicants will develop a proposed HCP and ensure that adequate funding for the plan will be provided;

4. The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and

5. The applicants will carry out any other measures that the Service may require as being necessary or appropriate for the purposes of the HCP.

Thus, the purpose of issuing an ITP would be to allow the applicant to carry out development activities associated with the proposed photo-voltaic power generating facility while conserving the covered species and their habitats. The Service expects that the applicants will request ITP coverage for a period of 50 years.

Alternatives in the Draft Environmental Impact Statement

The proposed action presented in the draft EIS will be compared to the no-action alternative. The no-action alternative represents estimated future conditions assuming an ITP is not issued, to which the proposed action's estimated future conditions can be compared. Other alternatives, including their potential impacts, will also be addressed in the draft EIS.

No-Action Alternative

Under the no-action alternative, an ITP pursuant to Section 10(a)(1)(B) of the Act would not be issued for development of the Maricopa Sun Solar Complex Project. The proposed Maricopa Sun Solar Complex Project and HCP would not occur without issuance of an ITP. According to the applicant, the proposed planning area would be reconsidered and the existing land uses would be maintained at the sites of proposed photovoltaic facilities until and unless an ITP could be secured. The applicant's intended purpose for the project would not be met under the no-action alternative.

Proposed Alternative

The proposed action is the issuance of an ITP to Maricopa Sun, LLC covering impacts to the 20 covered species resulting from development activities within the proposed planning area for a period of 50 years. The proposed HCP, which must meet the requirements of section 10(a)(2)(A) of the Act, including measures that minimize and mitigate the effects of the potential incidental take of covered species to the maximum extent practicable, would be developed and implemented by the applicant. This

alternative would be intended to allow for a comprehensive mitigation approach for unavoidable impacts and reduce permit processing times and efforts for the applicant and the Service.

Activities proposed for coverage under the proposed ITP would be otherwise lawful activities that could occur consistent with the HCP, to include, but not be limited to the following general categories:

1. Pre-construction
2. Construction
3. Operation
4. Decommissioning
5. Preservation/Enhancement
6. Conservation Plan Management

Pre-construction could include activities such as surveying and staking, clearing and grubbing, staging areas, temporary access roads, drainage and erosion control, and geotechnical drilling. Construction related activities could include grading and compaction, trenching, paving of access roads, installation of solar arrays, meteorological stations, transmission lines, septic leach fields, fencing, and landscaping. Construction of solar facilities on all sites is anticipated to be completed over an 8 to 10 year period from the commencement of the initial development; however, unknown constraints could extend the development phase to a 10 to 15 year period. Construction of the project will occur in a series of approximately 1 megawatt blocks, consisting of approximately 5 to 8.64 acres each. It is anticipated that construction of each section (640 acres) within the Maricopa Sun Solar Complex will take 12 to 18 months. Operation related activities could include solar panel maintenance, on-site parking, operation of solar modules, inspection, and repair of equipment, and operation of lighting. Typical activities associated with decommissioning of the solar energy facility include removal of all solar electric systems, buildings, cabling, electrical components, breaking up of concrete pads and foundations, removal of access roads, additional grading, and replacement of soil disturbed from decommissioning. Preservation/enhancement and conservation plan management activities could include vegetation control (i.e., grazing and mowing), fence installation, special status species monitoring (i.e., surveys such as trapping, use of remote cameras and spotlighting), and habitat restoration and creation.

We anticipate that the following five federally listed endangered species will be included as covered species in the applicants' proposed HCP:

Blunt-nosed leopard lizard (*Gambelia sila*)

Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*)

Giant kangaroo rat (*Dipodomys ingens*)
San Joaquin kit fox (*Vulpes macrotis mutica*)

Buena Vista Lake shrew (*Sorex ornatus relictus*)

We also anticipate that the following federally non-listed species will be included as covered species in the applicant's proposed HCP:

Western spadefoot (*Spea hammondi*)

Silvery legless lizard (*Anniella pulchra pulchra*)

San Joaquin whipsnake (*Masticophis flagellum ruddocki*)

California horned lizard (*Phrynosoma coronatum*)

Western Burrowing owl (*Athene cunicularia*)

Swainson's hawk (*Buteo swainsoni*)

Mountain plover (*Charadrius montanus*)

Northern harrier (*Circus cyaneus*)

White-tailed kite (*Elanus leucurus*)

Le Conte's thrasher (*Toxostoma lecontei*)

San Joaquin antelope squirrel (*Ammospermophilus nelson*)

Western mastiff bat (*Eumops perotis californicus*)

Tulare grasshopper mouse (*Onychomys torridus tularensis*)

San Joaquin pocket mouse (*Perognathus inornatus*).

Inclusion of these non-listed species as covered species will be determined during the HCP planning and development process. If included as covered species, the HCP will treat these species the same as the federally listed species. All species included in the incidental take permit would receive assurances under our "No Surprises" regulations (50 CFR 17.22(b)(5) and 17.32(b)(5)).

Other Alternatives

The draft EIS will include a reasonable range of additional alternatives. The range of alternatives considered in the draft EIS could include variations in impacts, conservation, permit duration, covered species, covered activities, permit area, or a combination of these elements.

Environmental Review and Next Steps

The Service will conduct an environmental review to analyze the proposed action, along with other alternatives evaluated and the associated impacts of each. The draft EIS will evaluate impacts for each covered species and is expected to provide biological descriptions of the

affected species and habitats, as well as the effects of the alternatives on other resources, such as vegetation, wetlands, wildlife, geology and soils, air quality, water resources, water quality, cultural resources, land use, recreation, water use, local economy, and environmental justice.

Following completion of the environmental review, the Service will publish a notice of availability and a request for comment on the draft EIS and the applicant's permit application, which will include the proposed HCP. The draft EIS and proposed HCP are expected to be completed and available to the public in spring 2012.

Public Comments

We request data, comments, new information, or suggestions from the public, other concerned governmental agencies, the scientific community, Tribes, industry, or any other interested party on this notice. We will consider these comments in developing a draft EIS and in the development of a HCP and ITP. We particularly seek comments on the following:

1. Biological information concerning the species;
2. Relevant data concerning the species;
3. Additional information concerning the range, distribution, population size, and population trends of the species;
4. Current or planned activities in the planning area and their possible impacts on the species;
5. The presence of archeological sites, buildings and structures, historic events, sacred and traditional areas, and other historic preservation concerns, which are required to be considered in project planning by the National Historic Preservation Act;
6. Identification of any other alternatives to the proposed action that should be analyzed in the draft EIS; and
7. Identification of any other environmental issues that should be considered in the draft EIS.

You may submit your comments and materials by one of the methods listed in the **ADDRESSES** section.

Comments and materials we receive, as well as supporting documentation we use in preparing the EIS document, will be available for public inspection by appointment, during normal business hours, at our office (see **FOR FURTHER INFORMATION CONTACT**).

Public Availability of Comments

Written comments we receive become part of the public record associated with this action. Before including your address, phone number, email address, or other personal identifying

information in your comments, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Scoping Meetings

See **DATES** for the date and time of our public meeting. The purpose of scoping meetings is to provide the public with a general understanding of the background of the proposed HCP and activities it would cover, alternative proposals under consideration for the draft EIS, and the Service's role and steps to be taken to develop the draft EIS for the proposed HCP.

The meeting format will consist of a formal presentation of the proposed action, summary of the NEPA process, and presentation of oral comments from the public. The primary purpose of these meetings and public comment period is to solicit suggestions and information on the scope of issues and alternatives for the Service to consider when drafting the EIS. Written comments will be accepted at the meetings. Comments can also be submitted by methods listed in the **ADDRESSES** section. Once the draft EIS and proposed HCP are complete, there will be additional opportunity for public comment on the content of the EIS through a Notice of Availability.

Meeting Location Accommodations

Please note that the meeting location is accessible to wheelchair users. If you require additional accommodations, please notify us at least one week in advance of the meeting.

Authority

We provide this notice under section 10 of the Act (16 U.S.C. 1531 *et seq.*) and by NEPA Regulations (40 CFR 1501.7, 40 CFR 1506.6, and 1508.22).

Paul McKim,

Acting Deputy Regional Director, Pacific Southwest Region, U.S. Fish and Wildlife Service, Sacramento, California.

[FR Doc. 2011-32894 Filed 12-22-11; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

Renewal of Agency Information Collection for Law and Order on Indian Reservations—Marriage & Dissolution Applications; Request for Comments

AGENCIES: Bureau of Indian Affairs, Interior.

ACTION: Notice of submission to OMB.

SUMMARY: In compliance with the Paperwork Reduction Act of 1995, the Bureau of Indian Affairs (BIA) is submitting to the Office of Management and Budget (OMB) a request for renewal for the collection of information titled "Law and Order on Indian Reservations—Marriage & Dissolution Applications." The information collection is currently authorized by OMB Control Number 1076-0094, which expires December 31, 2011.

DATES: Interested persons are invited to submit comments on or before *January 23, 2012*.

ADDRESSES: You may submit comments on the information collection to the Desk Officer for the Department of the Interior at the Office of Management and Budget, by facsimile to (202) 395-5806 or you may send an email to: OIRA_DOCKET@omb.eop.gov. Please send a copy of your comments to Tricia Tingle, Associate Director, Tribal Justice Support, Office of Justice Services, Bureau of Indian Affairs, 1849 C Street NW., MS-4141, Washington, DC 20240; Tricia.Tingle@bia.gov.

FOR FURTHER INFORMATION CONTACT: Tricia Tingle (202) 208-2675. You may review the ICR online at <http://www.reginfo.gov>. Follow the instructions to review Department of the Interior collections under review by OMB.

SUPPLEMENTARY INFORMATION:

I. Abstract

The Bureau of Indian Affairs is seeking renewal of the approval for the information collection conducted under 25 CFR 11.600(c) and 11.606(c). This information collection allows the Clerk of the Court of Indian Offenses to collect personal information necessary for a Court of Indian Offenses to issue a marriage license or dissolve a marriage. Courts of Indian Offenses have been established on certain Indian reservations under the authority vested in the Secretary of the Interior by 5 U.S.C. 301 and 25 U.S.C. 2, 9, and 13, which authorize appropriations for "Indian judges." The courts provide for the administration of justice for Indian tribes in those areas where the tribes



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX**

75 Hawthorne Street
San Francisco, CA 94105

FEB 14 2012

RECEIVED

FEB 16 2012

MAIL ROOM

Mr. Justin Sloan
Senior Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

Subject: Notice of Intent to Prepare an Environmental Impact Statement for the Maricopa Sun Solar Complex Multi-Species Habitat Conservation Plan, Kern County, California

Dear Mr. Sloan:

The U.S. Environmental Protection Agency has reviewed the Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Maricopa Sun Solar Complex Multi-Species Habitat Conservation Plan (HCP) pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

The EPA supports the objectives of this HCP. Kern County has been, and will continue to be, at the forefront of solar energy development in California. This development, while a good source of jobs, and crucial to meeting the state's renewable portfolio standard, poses many challenges to the county's wildlife and water resources. We believe that the integrated approach proposed for this HCP, which evaluates the potential for solar energy development and conservation, is far superior to attempting to avoid, minimize, and mitigate adverse ecological impacts for individual projects.

We have enclosed detailed comments that we hope will inform the development of the EIS for this HCP. Two of our biggest concerns, and subjects that we encourage the Service to examine in detail in the EIS, are the cumulative impacts of the solar development proposed for this and other projects in Kern County, and the effects of climate change on the species proposed for coverage in this HCP.

We appreciate the opportunity to review this NOI and are available to discuss our comments. When the Draft EIS is released for public review, please send one hard copy and one CD to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 947-4221 or gerdes.jason@epa.gov.

Sincerely,

Jason Gerdes
Environmental Review Office

Enclosures: EPA's Detailed Comments

US EPA DETAILED COMMENTS ON THE SCOPING NOTICE OF INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT FOR THE MARICOPA SUN SOLAR COMPLEX MULTI-SPECIES HABITAT CONSERVATION PLAN, KERN COUNTY, CALIFORNIA – FEBRUARY 14, 2012

Purpose and Need

The environmental impact statement (EIS) should include a clear description of the project purpose and need, including why the U.S. Fish and Wildlife Service (“Service”) and Maricopa Sun, LLC (“Maricopa”) are undertaking the proposed action and what objectives are intended to be met (40 CFR 1502.13). The purpose and need statement should clearly define the scope of the proposed actions that the EIS will describe and assess for environmental effects, such as issuing the Incidental Take Permit and the covered activities and conservation measures of the Habitat Conservation Plan (HCP).

Recommendation:

The EIS should clarify whether any covered activities and conservation measures will be assessed under separate and future environmental review. If direct and indirect effects of any covered activities and conservation measures are not to be assessed in the EIS, they should be described and included in the cumulative impacts analysis to the extent that they are reasonably foreseeable.

Alternatives Analysis

The EIS should evaluate a broad mix of alternatives that are creative and flexible. NEPA requires evaluation of reasonable alternatives, including those that may not be within the jurisdiction of the lead agency (40 CFR Section 1502.14(c)). Furthermore, there should be a clear discussion of the reasons for the elimination of alternatives that were not evaluated in detail. The EIS should describe how each alternative was developed, how it addresses each project objective, and how it will be implemented. We urge consideration of all feasible options, including creative project development and wildlife management tools, habitat restoration, and species conservation measures.

The EIS should indicate what measures will be taken to protect important wildlife habitat areas from potential adverse effects of the proposed alternatives. We encourage habitat conservation alternatives that avoid and protect high-value habitat and create or preserve linkages between habitat areas to better conserve the covered species. It is also imperative that the habitat conservation alternatives be based on defensible science, and that the EIS include a full description and evaluation of the scientific foundation and justification for the HCP design.

Recommendations:

The environmental impacts of the proposed action and alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). The potential environmental impacts of each alternative should be quantified to the greatest extent possible.

The EIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not. Thresholds of significance should be determined by considering the context and intensity of an action and its effects (40 CFR 1508.27).

The Service and Maricopa should consider developing, if not already in place, a scientific advisory committee to help craft a scientifically supportable HCP.

Environmental Review Process

Recommendations:

The EIS should describe: 1) how, and if, it will serve as a “tiering” document for subsequent NEPA analysis prepared for specific project applications; 2) the factors used to determine when a subsequent EIS will be required; and 3) the factors used to determine when an Environmental Assessment will be required.

Siting of the Solar Energy Projects

One of the most important recommendations that the EPA can make to the Service about the HCP is to maximize the siting of the solar energy projects on previously disturbed land, including retired and fallowed agricultural lands.

Recommendations:

To the greatest possible extent, renewable energy projects should be sited on previously disturbed land. Project proponents should avoid and minimize any disturbance of fragile soils, as well as physical processes, such as washes and drainages, crucial to sustaining desert ecosystems.

Water Resources

Water Supply and Water Quality

The EIS should estimate the quantity of water that projects within the HCP will require and describe the source of this water and potential effects on other water users and natural resources in the Plan’s area of influence. The EIS should clearly describe existing groundwater conditions, potential cumulative impacts to groundwater quantity and quality, and avoidance measures to prevent impacts. The EIS should clearly depict reasonably foreseeable direct, indirect, and cumulative impacts to this resource. Specifically, the potentially-affected groundwater basin should be identified and any potential for subsidence and impacts to springs or other open water bodies and biologic resources should be analyzed. The EIS should include:

- A discussion of the amount of water needed for each solar energy facility, where this water will be obtained, the reliability of this source, and the amount and source of power that would be needed to move the water to and through the facility;
- A discussion of availability of groundwater within the basin and annual recharge rates;
- A description of the water right permitting process and the status of water rights within that basin, including an analysis of whether water rights have been over-allocated;
- A description of any water right permits that contain special conditions; measures to mitigate direct, indirect, and cumulative impacts; and provisions for monitoring and adaptive management;
- A detailed discussion of cumulative impacts to groundwater supply within the hydrographic basin(s) that would support the alternatives, including impacts from other large-scale energy installations that have also been proposed; and

- A discussion of whether it would be feasible to use other sources of water, including wastewater or deep-aquifer water.

Disposal of Discharges

The EIS should address the potential effects of project discharges, if any, on surface and groundwater quality. Discharges may include, but are not limited to, thermal changes, suspended solids, toxicity, metals, oil and grease, chlorine, salinity, and pH. At the project level, the specific discharges should be identified and potential effects of discharges on designated beneficial uses of affected waters should be analyzed. The EIS should note that a National Pollutant Discharge Elimination System (NPDES) permit would be required for discharges to waters of the United States. The disposal of wastewater or other fluids into the subsurface is subject to the requirements of the Underground Injection Control Program, pursuant to the Safe Drinking Water Act. Permits may or may not be required, depending on project specifications and federal and/or state requirements. The subsequent EISs/EAs should address how the proposed project would be designed and operated to ensure that the facility meets federal and state water quality standards that provide for the protection and maintenance of beneficial uses downstream from the facility.

Clean Water Act Section 404

The project applicants will need to coordinate with the U.S. Army Corps of Engineers to determine if proposed projects within the HCP area will require a Section 404 permit under the CWA. Section 404 regulates the discharge of dredged or fill material into waters of the United States (WOUS), including wetlands and other special aquatic sites. In order to comply with the 404(b)(1) Guidelines, the applicant must determine the geographic extent of waters and comprehensively evaluate a range of alternatives to ensure that the “preferred” alternative is the Least Environmentally Damaging Practicable Alternative (LEDPA). Identification of the LEDPA is achieved by performing an alternatives analysis that estimates the direct, indirect, and cumulative impacts to jurisdictional waters resulting from a set of on- and off-site project alternatives. In particular, EPA would like to clarify that the alternatives analysis that is required for a Section 404 permit differs from the alternatives analysis required under NEPA. The Section 404 alternatives analysis must include on-site and off-site alternatives, which may include private land, federally-administered land, and/or disturbed sites. Project alternatives that are not practicable and do not meet the project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, so long as it does not have other significant adverse environmental consequences.

Pursuant to the Guidelines, mitigation of project impacts begins with the avoidance and minimization of direct, indirect, and cumulative impacts to the aquatic ecosystem, followed by compensatory measures if a loss of aquatic functions and/or acreage is unavoidable. Compensatory mitigation is, therefore, intended only for unavoidable impacts to waters after the LEDPA has been determined. If a Section 404 permit is required, the EPA will review the project for compliance with the Guidelines; the burden to demonstrate compliance with the Guidelines rests with the permit applicant.

Planning-level Assessment of Aquatic Resources

Ideally, to facilitate tiering of project-level environmental reviews to the HCP, a jurisdictional determination (JD) would be completed for each area designated for energy development; however, we

recognize that this would be a resource-intensive undertaking. At a minimum, the EPA recommends that a *planning level delineation of aquatic resources* be performed within each of the energy development areas. This may not disclose all aquatic resources, but it would provide additional information on the presence of aquatic resources within the study area subject to NEPA that may be subject to federal jurisdiction under Section 404 of the CWA. A proposed project's impacts to waters subject to federal jurisdiction could result in significant degradation, as defined at 40 CRF Part 230 (Guidelines).

Recommendations:

The EPA recommends that a *planning level delineation of aquatic resources* be performed within each of the designated energy development areas. This would include the identification of aquatic resources using aerial photography, existing mapping data available, and field verification. The results of such delineations should be included in the DEIS.

The DEIS should clearly explain the circumstances under which a formal site-specific JD would be required and at what point in the project planning process it would be conducted.

Drainages, Ephemeral Washes, and Floodplains

Ephemeral and intermittent streams make up over 81% of streams in the arid and semi-arid Southwest (Arizona, California, Colorado, Nevada, New Mexico, and Utah).¹ Ephemeral washes, playas, and other aquatic resources within the desert perform a diversity of hydrologic and biogeochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging, and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. The evaluation of these aquatic resources should not be discounted.

Recommendations:

The EIS should describe the natural drainage patterns within the planning area, including the 50 or 100 year floodplain, and characterize the general functions of the main aquatic features within the HCP area.

The EIS should include information on the functions and locations of WOUS, as well as ephemeral washes, because of the important hydrologic and biogeochemical role these washes play in direct relationship to higher-order waters downstream.

The EPA recommends utilizing existing natural drainage channels on site and more natural features, such as earthen berms or channels, rather than concrete-lined channels to avoid and minimize direct and indirect impacts to desert washes (such as erosion, migration of channels and local scour), and the use of natural washes in their present location and form.

Clean Water Act Section 303(d)

¹ See Internet address: <http://azriparian.org/docs/arc/publications/EphemeralStreamsReport.pdf>

The CWA requires States to develop a list of impaired waters that do not meet water quality standards, establish priority rankings, and develop action plans, called Total Maximum Daily Loads (TMDLs), to improve water quality.

Recommendation:

The EIS should provide information on CWA Section 303(d) impaired waters in the HCP planning area, if any, and efforts to develop and revise TMDLs. The EIS should describe existing restoration and enhancement efforts for those waters, how the proposed project will coordinate with on-going protection efforts, and any mitigation measures that will be implemented to avoid further degradation of impaired waters.

Biological Resources and Habitat

The EIS should clearly describe direct, indirect, and cumulative impacts to wildlife and habitat and measures to avoid and mitigate impacts to these species. Emphasis should be placed on the protection and recovery of HCP covered species due to their status under the Endangered Species Act. Analysis of impacts and mitigation covered species should include:

- Baseline conditions of habitats and populations of the covered species sufficient enough for estimates of take, and development of adequate avoidance, mitigation, and conservation measures that are rationally related to anticipated take.
- A clear description of how avoidance, mitigation, and conservation measures will protect and aid in the recovery of the covered species and their habitats in the protected area.
- Monitoring, reporting, and adaptive management efforts to ensure compliance with the HCP and species and habitat conservation effectiveness.

Air Quality

The EIS should provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the proposed Covered Activities (including cumulative and indirect impacts). Such an evaluation is necessary to assure compliance with State and Federal air quality regulations, and to disclose the potential impacts from temporary or cumulative degradation of air quality.

The EIS should describe and estimate air emissions from the proposed Covered Activities, including potential construction and maintenance activities, as well as proposed mitigation measures to minimize those emissions. The EPA recommends an evaluation of the following measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics).

Recommendations:

- *Existing Conditions* – The EIS should provide a detailed discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in all areas considered for renewable energy development.
- *Quantify Emissions* – The EIS should estimate emissions of criteria pollutants from the proposed project and discuss the timeframe for release of these emissions over the lifespan of

the project. The EIS should describe and estimate emissions from potential construction activities, as well as proposed mitigation measures to minimize these emissions.

- *Specify Emission Sources* – The EIS should specify the emission sources by pollutant from mobile sources, stationary sources, and ground disturbance. This source specific information should be used to identify appropriate mitigation measures and areas in need of the greatest attention.
- *Equipment Emissions Mitigation Plan (EEMP)* – The EIS should identify the need for an EEMP. An EEMP will identify actions to reduce diesel particulate, carbon monoxide, hydrocarbons, and NO_x associated with construction activities. We recommend that the EEMP require that all construction-related engines:
 - are tuned to the engine manufacturer’s specification in accordance with an appropriate time frame;
 - do not idle for more than five minutes (unless, in the case of certain drilling engines, it is necessary for the operating scope);
 - are not tampered with in order to increase engine horsepower;
 - include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the project site;
 - use diesel fuel having a sulfur content of 15 parts per million or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area; and
 - include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include drilling equipment, generators, compressors, graders, bulldozers, and dump trucks.
- *Fugitive Dust Control Plan* - The EIS should identify the need for *Fugitive Dust Control Plan*. We recommend that it include these general recommendations:
 - Stabilize open storage piles and by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
 - Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and
 - When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

General Conformity

The EIS should address the applicability of CAA Section 176 and EPA’s general conformity regulations at 40 CFR Parts 51 and 93. Federal agencies need to ensure that their actions, including construction emissions subject to state jurisdiction, conform to an approved implementation plan. Emissions authorized by a CAA permit issued by the State or the local air pollution control district would not be assessed under general conformity but through the permitting process.

Recommendation:

Cumulative impacts to air quality should be analyzed given the potential air quality impacts from construction activities.

Climate Change

On December 7, 2009, the EPA determined that emissions of greenhouse gases (GHGs) contribute to air pollution that “endangers public health and welfare” within the meaning of the CAA. One report, released by the California Energy Commission, indicates that observed changes in temperature, sea level, precipitation regime, fire frequency, and agricultural and ecological systems reveal that California is already experiencing the measurable effects of climate change². These manifestations of climate change create additional urgency when evaluating potential impacts associated with development in fragile desert ecosystems. The proposed period of incidental take coverage (50 years) will likely be a time of profound change in the deserts of southern California. Consequently, the Maricopa HCP should include provisions to monitor and reassess the status of Covered Species, the distribution of species throughout the planning area, and the need for new or expanded conservation lands at regular intervals throughout the duration of the proposed period of coverage.

Recommendations:

The EIS should consider how the effects of climate change could potentially impact the HCP, particularly sensitive resources, and what measures could be incorporated into the Plan to limit these impacts.

The Service should also develop a robust monitoring and adaptive management plan to account for, mitigate, and adapt to, the effects of climate change on the Covered Species and the habitats in which these species depend. Monitoring should be done at regular intervals throughout the entire period of coverage.

The EIS should describe water reliability for the proposed project and clarify how existing and/or proposed sources will be affected by climate change. At a minimum, the EPA expects a qualitative discussion of impacts of climate change to water supply, and the adaptability of the project to these changes.

Indirect and Cumulative Impacts

The cumulative impacts analysis should provide the context for understanding the magnitude of the impacts of the alternatives by analyzing the impacts of other past, present, and reasonably foreseeable projects or actions and then considering those cumulative impacts in their entirety (CEQ's Forty Questions, #18). The EIS should clearly identify the resources that may be cumulatively impacted, the time over which impacts are going to occur, and the geographic area that will be impacted by the proposed project. The EIS should focus on resources of concern – those resources that are “at risk” and/or are significantly impacted by the proposed project, before mitigation. In the introduction to the

² Moser, Susie, Guido Franco, Sarah Pittiglio, Wendy Chou, Dan Cayan. 2009. The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California. California Energy Commission, PIER Energy-Related Environmental Research Program. CEC-500-2008-071.

Cumulative Impacts Section, identify which resources are analyzed, which ones are not, and why. For each resource analyzed, the EIS should:

- Identify the current condition of the resource as a measure of past impacts. For example, the percentage of species habitat lost to date.
- Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or in stasis.
- Identify all on-going, planned, and reasonably foreseeable projects in the study area that may contribute to cumulative impacts.
- Identify the future condition of the resource based on an analysis of impacts from reasonably foreseeable projects or actions added to existing conditions and current trends.
- Assess the cumulative impacts contribution of the proposed alternatives to the long-term health of the resource, and provide a specific measure for the projected impact from the proposed alternatives.
- Disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts.
- Identify opportunities to avoid and minimize impacts, including working with other entities.

As an indirect result of providing additional power, it can be anticipated that this project will allow for development and population growth to occur in those areas that receive the generated electricity.

Recommendations:

The EIS should describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply. The document should provide an estimate of the amount of growth, its likely location, and the biological and environmental resources at risk.

The EIS should consider the direct and indirect effects of the inter-connecting transmission lines for the proposed HCP projects, as well as the cumulative effects associated with the transmission needs of other reasonably foreseeable projects.

Mitigation and Pollution Prevention

The EIS should evaluate the feasibility of adopting mitigation to avoid, reduce, or compensate for, adverse environmental impacts from construction and operation. NEPA does not require that an impact be “significant” before mitigation can be presented in an EIS. “All relevant, reasonable mitigation measures that could improve the project are to be identified. . . . Mitigation measures must be considered even for impacts that by themselves would not be considered ‘significant.’ Once the proposal itself is considered as a whole to have significant effects . . . mitigation measures must be developed where it is feasible to do so.” (CEQ’s Forty Questions, #19a)

CEQ also issued guidance³ on integrating pollution prevention measures in NEPA documents. Many strategies can reduce pollution and protect resources, including using fewer toxic inputs, altering manufacturing and facility maintenance processes, and conserving energy. Consistent with CEQ’s guidance, we recommend presenting all reasonable mitigation and pollution prevention measures and how these may be incorporated into future agreements.

³Memorandum to Heads of Federal Departments and Agencies Regarding Pollution Prevention and the National Environmental Policy Act, CEQ, January 12, 1993.

Implementation of Adaptive Management Techniques for Mitigation Measures

Adaptive management is an iterative process that requires selecting and implementing management actions, monitoring, comparing results with management and project objectives, and using feedback to make future management decisions. The process recognizes the importance of continually improving management techniques through flexibility and adaptation instead of adhering rigidly to a standard set of management actions. Although adaptive management is not a new concept, it may be relatively new in its application to specific projects. The effectiveness of adaptive management monitoring depends on a variety of factors including:

- a) The ability to establish clear monitoring objectives;
- b) Agreement on the impact thresholds being monitored;
- c) The existence of a baseline or the ability to develop a baseline for the resources being monitored;
- d) The ability to see the effects within an appropriate time frame after the action is taken;
- e) The technical capabilities of the procedures and equipment used to identify and measure changes in the affected resources and the ability to analyze the changes; and
- f) The resources needed to perform the monitoring and respond to the results.

Recommendation:

The EPA recommends that the Service consider adopting a formal adaptive management plan to evaluate and monitor impacted resources and ensure the successful implementation of mitigation measures.

To be most effective, the monitoring studies and the adaptive management plan should be implemented during planning.

Project Decommissioning, Site Restoration, and Financial Assurance

The EIS should include a description of how the Maricopa solar energy facilities will be decommissioned and reclaimed.

Recommendation:

The EPA recommends that the DEIS include a requirement for a decommissioning and site restoration plan to include cost estimates; the project owner to secure a performance bond surety bond, letter of credit, corporate guarantee, or other form of financial assurance adequate to cover the cost of decommissioning/restoration; description of the conditions when decommissioning will commence; description of time allotted to complete the decommissioning; description of the structures, facilities, and foundations to be removed; and restoration of the site by recontouring the surface and revegetation to a condition reasonably similar to the original condition.

Coordination with Tribal Governments

Executive Order 13175, “Consultation and Coordination with Indian Tribal Governments” (November 6, 2000), was issued in order to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Indian tribes.

Recommendation:

The EIS should describe the process and outcome of government-to-government consultation between the Service and each of the tribal governments within the project area, issues that were raised (if any), and how those issues were addressed in the selection of the proposed alternative.

National Historic Preservation Act and Executive Order 13007

Consultation for tribal cultural resources is required under Section 106 of the National Historic Preservation Act (NHPA). Historic properties under the NHPA are properties that are included in the National Register of Historic Places (NRHP) or that meet the criteria for the National Register. Section 106 of the NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, consult with the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO). Under NEPA, any impacts to tribal, cultural, or other treaty resources must be discussed and mitigated. Section 106 of the NHPA requires that Federal agencies consider the effects of their actions on cultural resources, following regulation in 36 CFR 800.

Executive Order 13007, “Indian Sacred Sites” (May 24, 1996), requires federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian Religious practitioners, and to avoid adversely affecting the physical integrity, accessibility, or use of sacred sites. It is important to note that a sacred site may not meet the National Register criteria for a historic property and that, conversely, a historic property may not meet the criteria for a sacred site.

Recommendation:

The EIS should address the existence of Indian sacred sites in the project areas. It should address Executive Order 13007, distinguish it from Section 106 of the NHPA, and discuss how the Service will avoid adversely affecting the physical integrity, accessibility, or use of sacred sites, if they exist. The EIS should provide a summary of all coordination with Tribes and with the SHPO/THPO, including identification of NRHP eligible sites, and development of a Cultural Resource Management Plan.

Environmental Justice

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (February 11, 1994), and the “Memorandum of Understanding on Environmental Justice and Executive Order 12898,” released on August 4, 2011, direct federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations, allowing those populations a meaningful opportunity to participate in the decision-making process. Guidance⁴ by CEQ clarifies the terms low-income and

⁴Environmental Justice Guidance under the National Environmental Policy Act, Appendix A (Guidance for Federal Agencies on Key Terms in Executive Order 12898), CEQ, December 10, 1997.

minority population (which includes American Indians) and describes the factors to consider when evaluating disproportionately high and adverse human health effects.

Recommendation:

The EIS should include an evaluation of environmental justice populations within the geographic scope of the project. If such populations exist, the EIS should address the potential for disproportionate adverse impacts to minority and low-income populations, and the approaches used to foster public participation by these populations. Assessment of the project's impact on minority and low-income populations should reflect coordination with those affected populations.

Coordination with Land Use Planning Activities

The EIS should discuss how the proposed action would support or conflict with the objectives of federal, state, tribal or local land use plans, policies and controls in the project area. The term "land use plans" includes all types of formally adopted documents for land use planning, conservation, zoning and related regulatory requirements. Proposed plans not yet developed should also be addressed if they have been formally proposed by the appropriate government body in a written form (CEQ's Forty Questions, #23b).

Invasive Species

Executive Order 13112, "Invasive Species" (February 3, 1999), mandates that federal agencies take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Executive Order 13112 also calls for the restoration of native plants and tree species. If the proposed project will entail new landscaping, the EIS should describe how the project will meet the requirements of Executive Order 13112.

Recommendation:

The EIS should include an invasive plant management plan to monitor and control noxious weeds.

Hazardous Materials/Hazardous Waste/Solid Waste

The EIS should address potential direct, indirect and cumulative impacts of hazardous waste from construction and operation of the proposed project. The document should identify projected hazardous waste types and volumes, and expected storage, disposal, and management plans. It should address the applicability of state and federal hazardous waste requirements. Appropriate mitigation should be evaluated, including measures to minimize the generation of hazardous waste (i.e., hazardous waste minimization). Alternate industrial processes using less toxic materials should be evaluated as mitigation. This potentially reduces the volume or toxicity of hazardous materials requiring management and disposal as hazardous waste.

APPENDIX B

MARICOPA SUN, LLC
HABITAT CONSERVATION PLAN

MARICOPA SUN SOLAR COMPLEX PROJECT
MARICOPA SUN, LLC
KERN COUNTY, CALIFORNIA

March 2014



Quad Knopf

Maricopa Sun Solar Complex Project
Maricopa Sun, LLC
Habitat Conservation Plan

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Maricopa Sun, LLC (Project Administrator) obtained approval from the County of Kern for the Maricopa Sun Solar Complex, a renewable energy solar project (Project) that included: 1) a General Plan Amendment (GPA) to the Circulation Element (GPA 5, Map 158 and GPA 1, Map 159) to eliminate section and midsection line arterial and collector road reservations; 2) a Conditional Use Permit (CUP) (Map 158 and Map 159) to allow the construction and operation of a solar electrical generating facility in an A (Agricultural) zone; 3) cancellation of Williamson Act land use contracts; and 4) recordation of Tentative Parcel Maps (TPMs) 11967 and 11968 (County of Kern 2010b). The Project involves the construction and operation of solar photovoltaic (PV) power generating facilities in the central west portion of unincorporated Kern County. Complete buildout of the Project will produce up to 700 megawatts (MW) of electricity.

The Project will be constructed by various third party solar developers (Developers) on private properties currently owned by affiliates of Maricopa Sun, LLC. The lands may be sold or leased to such Developers. Maricopa Sun, LLC will administer the activities performed by the Developers within the Project lands in accordance with the terms and conditions described in this Section 10(a)(1)(B) Habitat Conservation Plan (HCP) (Maricopa Sun, LLC HCP; also known as “MSHCP”). Also, as a component of MSHCP compliance, the Project Administrator (in cooperation with the Developers) will place the Solar Sites into conservation easements, effective once building/grading permits have been obtained at the start of solar development. The conservation easements will initially be operated as solar facilities and will transition to conservation lands to be managed as habitat for Covered Species once the solar facilities are decommissioned (after a maximum permit term of 35 years).

In 2011, an Environmental Impact Report (EIR) for the Maricopa Sun Solar Complex was adopted by Kern County. The EIR identified and evaluated potential environmental impacts associated with implementation of the proposed project. The analysis concluded that pursuant to Sections 15126.2 and 15355 of the California Environmental Quality Act (CEQA), impacts to biological resources would be significant and unavoidable following project compliance with all regulatory, statutory, and mitigation measures. This finding was based on the following: 1) although the project site is mostly devoid of special-status plant and animal species, after the project implementation, growth of natural vegetation on site may encourage special-status species to take advantage of newly formed habitat; 2) solar operations could result in the loss of those species and their habitat; and 3) considered alone, the loss of species and their habitat would not be significant; however, with other renewable energy projects being proposed throughout Kern County, there will be a significant cumulative impact (County of Kern, 2010b). The proposed project would result in take of federally listed species; therefore, incidental take authorization through the Section 10 process of the Federal Endangered Species Act (FESA) is necessary.

The purpose of this MSHCP is to outline a conservation strategy that Maricopa Sun, LLC and its affiliates will implement to minimize, avoid, and mitigate, to the maximum extent practicable, the incidental take of species that are currently listed or are likely to become listed by the United States Fish and Wildlife Service (USFWS) during the life of the project, and that may be subject to “take” as defined by the FESA. This MSHCP has been prepared to obtain incidental take

authorization under Section 10 of the FESA and Section 2081 of the California Endangered Species Act (CESA) for the proposed Covered Activities.

The MSHCP contains content as required by Section 10 of the FESA and its implementing regulations, as follows:

- An assessment of impacts likely to result from the proposed taking of one or more federally listed species.
- Measures undertaken to avoid, minimize, mitigate, and monitor impacts; the funding that will be made available to implement such measures; and the procedures to address unforeseen or extraordinary circumstances.
- Alternative actions to the taking that were analyzed, and the reasons why such alternatives were not adopted.
- Additional measures that the USFWS may require as necessary or appropriate.

Activities included in the MSHCP (Covered Activities) allow for: (1) pre-construction, construction, operations and maintenance, and decommissioning activities within Solar Sites; (2) management and maintenance activities associated with Movement Corridors and Conservation Sites, including monitoring and reporting activities; and (3) activities associated with implementation of the conservation program specified in this MSHCP. For the purposes of this MSHCP, the activities and their impacts described here represent the maximum scenario. It is anticipated that actual realized activities and their impacts will be less than have been indicated here.

PROJECT DESCRIPTION

The Maricopa Sun Solar Complex will include: a series of PV panels, inverters, transformers, circuit breakers, metering equipment, switchgear, protective relays, and larger transformers to step up the voltage to match the voltage of the transmission grid at the interconnection point, transmission lines, and operations and maintenance buildings adjacent to the solar field. The Project will also include one or more meteorological monitoring stations to track insulation temperature, wind direction, and speed.

The project sites are primarily comprised of undeveloped and vacant agricultural land, and have minimal relief. Surrounding land uses are both active and inactive agricultural land. Surrounding land use designations include intensive and extensive agriculture designations, lands designated as flood hazard areas, lands designated for public facilities; lands designated for the protection of important watershed recharge areas or wildlife habitat, or having value as a buffer between resource areas and urban areas, and lands designated for industrial uses.

The lands included in the MSHCP (Permit Area) encompass 5,784.3 acres, which are described as follows:

Permit Area: The Permit Area is the gross acreage of all parcels, which includes those parcels that will be developed into solar facilities (Solar Sites) and those that will be set aside as conservation areas (Conservation Sites). The Permit Area includes all existing public easements,

movement corridors, setbacks, the Solar Development Footprints, and the Conservation Sites. The Permit Area totals 5,784.3 acres.

Solar Sites: The portion of the Project that will be developed as the “Maricopa Sun Solar Complex.” The Solar Sites encompass 3,798.2 acres, all of which will be placed in conservation easements upon obtaining building/grading permits for solar facilities.

Solar Development Footprints: Those portions of the Solar Sites that will be developed into solar facilities. The Solar Development Footprints include a reduced area from the Solar Sites because of mandatory setbacks from existing roadways, setbacks from native habitat, the presence of wildlife Movement Corridors, and other necessary reductions in acreage. The Solar Development Footprints encompass 3,700.5 acres.

Movement Corridors: Corridors located along specified perimeters of Solar Sites that will be enhanced to facilitate the movement of wildlife species. The Movement Corridors encompass 33.8 acres.

Conservation Sites: These are parcels that will remain in their native state and/or be enhanced to provide habitat for species. These lands will be permanently conserved as mitigation for the Project’s impacts to biological species. These sites encompass 1,894.4 acres.

Construction of the first solar development for the Maricopa Sun Solar Complex is planned to begin immediately after procurement of all permits (which includes this MSHCP) and approval of required plans. Construction of solar facilities on all Solar Sites is anticipated to be completed over an 8- to 10-year period from the commencement of the initial development. Unknown constraints could extend the development phase to a 10- to 15-year period. It is anticipated that development of each individual solar facility within the Maricopa Sun Solar Complex will take 9 to 18 months, depending on the size of the solar facility, weather conditions, labor and equipment availability, and time of year. The operational life of each solar facility is anticipated to span a period of up to 25 years, during which time, routine operations and maintenance activities and repairs will be implemented. Decommissioning will occur prior to expiration of the MSHCP.

BIOLOGICAL GOALS AND OBJECTIVES

The biological goals and objectives for the MSHCP are required as part of the USFWS’s five-point policy initiative designed to clarify the elements of an HCP program as they relate to: measurable biological goals, adaptive management, monitoring, permit duration, and public participation. An HCP must include biological goals and objectives that set out specific measurable targets that the plan is intended to meet. These targets are based on the best scientific information available, and are used to guide conservation strategies for species covered by the plan.

The goals and objectives developed for each of the Covered Species are similar, as are the rationale for their importance as part of the conservation strategy. The Project’s primary

biological goals are to preserve Covered Species and provide Covered Species habitat within the Permit Area by:

1. Increasing the ability of San Joaquin kit fox to disperse through the Permit Area and providing habitat within the region;
2. Preserving existing populations of the Tipton kangaroo rat within the Permit Area and, providing habitat for the Tipton kangaroo rat within the Permit Area;
3. Preserving existing populations of the Nelson's antelope squirrel within the Permit Area and providing habitat for the Nelson's antelope squirrel within the Permit Area
4. Preserving existing populations of the western burrowing owl within the Permit Area and, providing habitat for the western burrowing owl within the Permit Area
5. Providing habitat for the blunt-nosed leopard lizard within the Permit Area.

CONSERVATION

The establishment of conservation easements on conservation lands and the initiation of management actions on those lands will be phased to coincide with the development of Solar Sites. Phasing of the establishment of the conservation easements will be accomplished such that each solar development will be offset with compensation obligations prior to initiation of development.

Habitat management, enhancement, and monitoring activities will be conducted during all phases of the Project and will be conducted on Solar Sites and Conservation Sites. Assurance of compliance with the MSHCP will be achieved through biological and Project monitoring carried out by a USFWS (and CDFW) approved, third-party biological monitor (Monitoring Agent). Conditions of Project approval and mitigation measures for the Project allow for mineral rights interests to be served by reserving a maximum of 5 separate 10-acre drilling site areas per 640 acres, and allowing for routes of ingress and egress thereto. The locations of the drilling islands have not yet been identified. Activities associated with the exploration and/or development of potential future drilling sites for the purposes of oil and gas exploration and production by mineral rights owners will be subject to separate incidental take authorization and environmental review, and are not covered by this MSHCP.

IMPACTS AND BENEFITS

Take resulting from direct adverse effects of project activities has the potential to occur during all phases of the Project. Direct adverse effects are those effects that result in the direct loss of habitat or direct lethal take of individuals of Covered Species. Implementation of specific minimization and avoidance measures will greatly reduce or eliminate the risk of the potential for take to occur due to direct adverse effects of Covered Activities. Nevertheless, there is a risk of direct adverse effects, including lethal take to occur as a result of some Covered Activities.

Complete development of the Maricopa Sun Solar Complex will result in the loss of 3,798.2 acres of potential habitat for all Covered Species. The project lands (Solar Sites, Movement Corridors, and Conservation Sites) are, with few exceptions, currently in a farm-ready, disked state, and provide poor to no habitat for any of the Covered Species. The potential exists that the project lands could return to a more natural state once disking has ceased, and could therefore support Covered Species at a distribution and level of abundance that does not currently exist.

The Project will ultimately lead to an improvement in habitat for Covered Species on all project lands (5,692.6 acres), occurring at various intervals over the course of the 35-year HCP timeframe, or after decommissioning. Habitat enhancements and management for Covered Species will begin immediately on the conservation lands. The Solar Sites will not be managed for Covered Species during the life of a solar project, and Covered Activities occurring on the Solar Sites are assumed to result in take of Covered Species. Minimization and avoidance measures will be implemented throughout the 35-year MSHCP permit term to reduce or eliminate the potential for lethal take of Covered Species to the extent possible.

MONITORING

Three specific types of monitoring will be conducted in association with the MSHCP:

- Compliance monitoring, which tracks the permit holder's compliance with the requirements specified in the HCP and permit.
- Effects monitoring, which tracks the effects of the Covered Activities on Covered Species.
- Effectiveness monitoring, which tracks the progress of the conservation strategy in meeting the biological goals and objectives of the HCP.

A geo-database will be created to ensure that all monitoring is properly implemented. The database will be populated with relevant information as tasks are completed, including the results of surveys and studies. Information gleaned from queries of the database will help guide the adaptive management process.

REPORTING

Reporting for the Project will include reporting on compliance with the avoidance and minimization measures incorporated into the HCP, reporting to document the effects of the HCP on Covered Species, and reporting to document the effectiveness of the HCP. Compliance monitoring during the pre-construction, construction, operations and maintenance, and decommissioning phases will be ongoing at a level commensurate with project activities.

IMPLEMENTATION

The MSHCP will be implemented under a Section 10(a)(1)(B) permit issued by the USFWS to the Project Administrator. The permit term will be 35 years, and will encompass Covered Activities up to and including the decommissioning process of the solar facilities. Assurance of compliance with the MSHCP will be achieved through biological and project monitoring.

ALTERNATIVES

Section 10(a)(2)(A) of the FESA requires applicants to consider alternative actions to the take of federally-listed species and explain the reasons why those alternatives were not selected. The following alternatives were considered and rejected for the reasons described:

No Action – the Project would not occur. An ITP would not be issued, because there would be no potential for take of Covered Species. Conversely, there would be no conservation benefit, because the Conservation Management Plan would not be implemented.

Reduced Permit Area – The Permit Area would be reduced from 5,784.3 acres to 3,682 acres by removing selected Project Sites. This alternative would result in fewer adverse effects to Covered Species; however, less land would be permanently conserved and managed for the benefit of wildlife, and the energy production goals of the Project would not be met.

Gravel Site – The ground surface of the Solar Development Footprints would be covered with gravel. The presence of gravel on the Solar Development Footprints would greatly reduce the potential habitat value of these lands after decommissioning, greatly increase the costs of habitat enhancement and management, and greatly reduce any conservation benefits that could otherwise be realized.

COSTS

Operations and maintenance, and decommissioning activities and costs will vary widely by project and construction schedules of the independent solar developers and their subcontractors (Developers) within the Maricopa Sun Solar Complex.

Extensive financial analyses of projected costs to implement the Project have been performed. The general cost categories for which estimates have been developed are: land acquisition, program administration, easement agreements, and an endowment agreement. Generally, Developers will be responsible for the costs to implement the MSHCP (i.e., those associated with monitoring, and those associated with implementation of the habitat conservation plans).

1.0

INTRODUCTION

1.0 INTRODUCTION

1.1 MSHCP Overview and Project Background

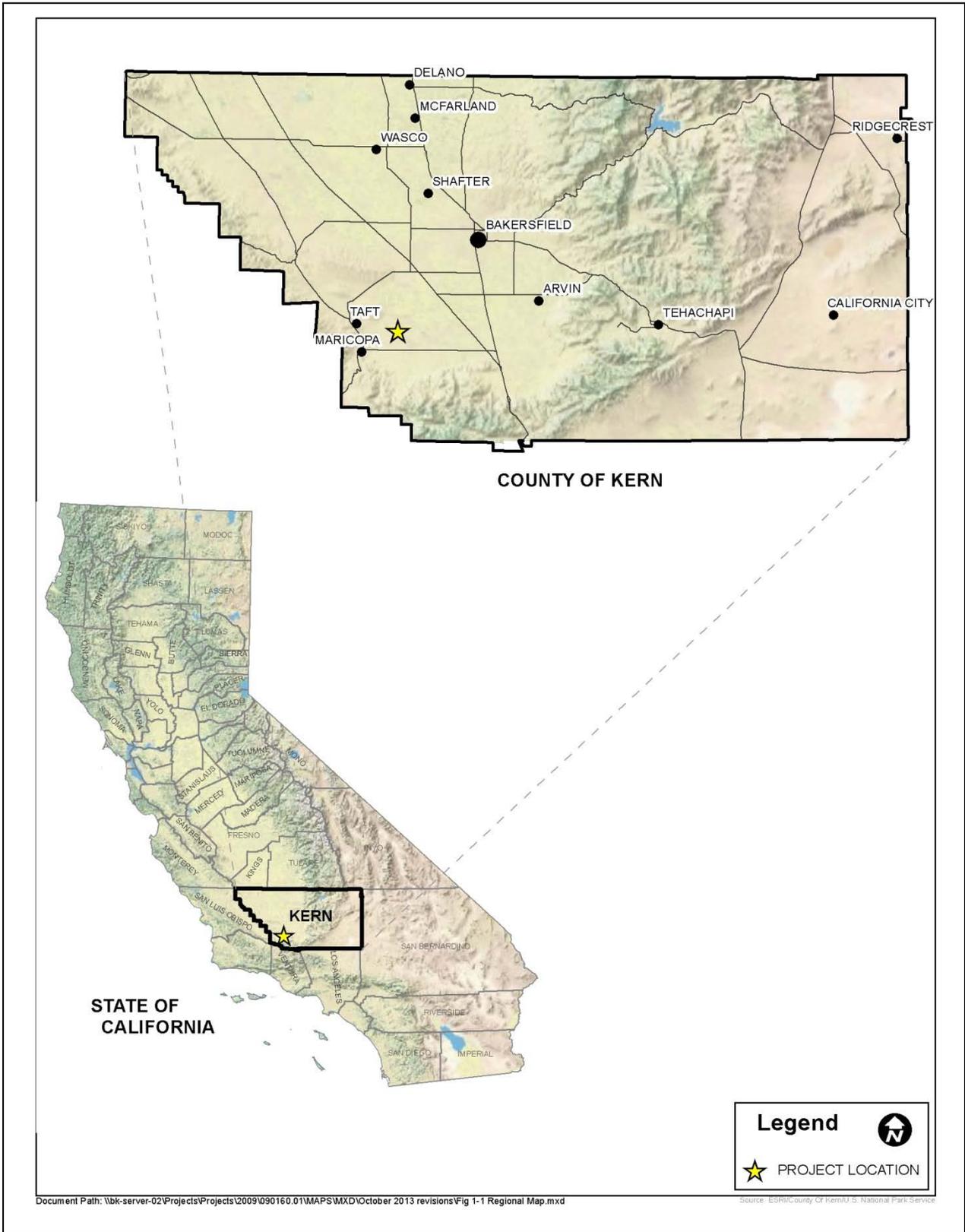
Maricopa Sun, LLC (Project Administrator) obtained approval from the County of Kern for the Maricopa Sun Solar Complex, a renewable energy solar project (Project) that included: 1) a General Plan Amendment (GPA) to the Circulation Element (GPA 5, Map 158 and GPA 1, Map 159) to eliminate section and midsection line arterial and collector road reservations; 2) a Conditional Use Permit (CUP) (Map 158 and Map 159) to allow the construction and operation of a solar electrical generating facility in an A (Agricultural) zone¹; 3) cancellation of Williamson Act land use contracts; and 4) recordation of Tentative Parcel Maps (TPMs) 11967 and 11968 (County of Kern 2010b). The Project involves the construction and operation of solar photovoltaic (PV) power generating facilities in the central west portion of unincorporated Kern County. Complete buildout of the Project will produce up to 700 megawatts (MW) of electricity.

Multiple parcels comprise the Project, which is located in southwestern Kern County, approximately 3 miles northeast of the unincorporated community of Maricopa (Figure 1-1). The individual sites are located in the vicinity of Interstate 5, and can be accessed from South Lake Road, Copus Road, and several other unnamed farm access roads. The Project sites are generally located east and north of the California Aqueduct; however, some Conservation Sites within the Project are located adjacent to and/or south of the aqueduct.

Figure 1-2 shows the site plan for the Maricopa Sun Solar Complex. The Project will be constructed by various third party solar developers (Developers) on private properties currently owned by affiliates of Maricopa Sun, LLC. The lands will be sold or leased to such Developers. Maricopa Sun, LLC will administer the activities performed by the Developers within the Project lands in accordance with the terms and conditions described in this Section 10(a)(1)(B) Incidental Take Permit (ITP) and Habitat Conservation Plan (HCP) (Maricopa Sun, LLC HCP, also known as MSHCP). Also, as a component of MSHCP compliance, the Project Administrator (in cooperation with the Developers) shall place the Solar Sites into conservation easements effective once building/grading permits have been obtained at the start of solar development. The conservation easements will initially be operated as solar facilities and will transition to conservation lands to be managed as habitat once the solar facilities are decommissioned (after a maximum permit term of 35 years).

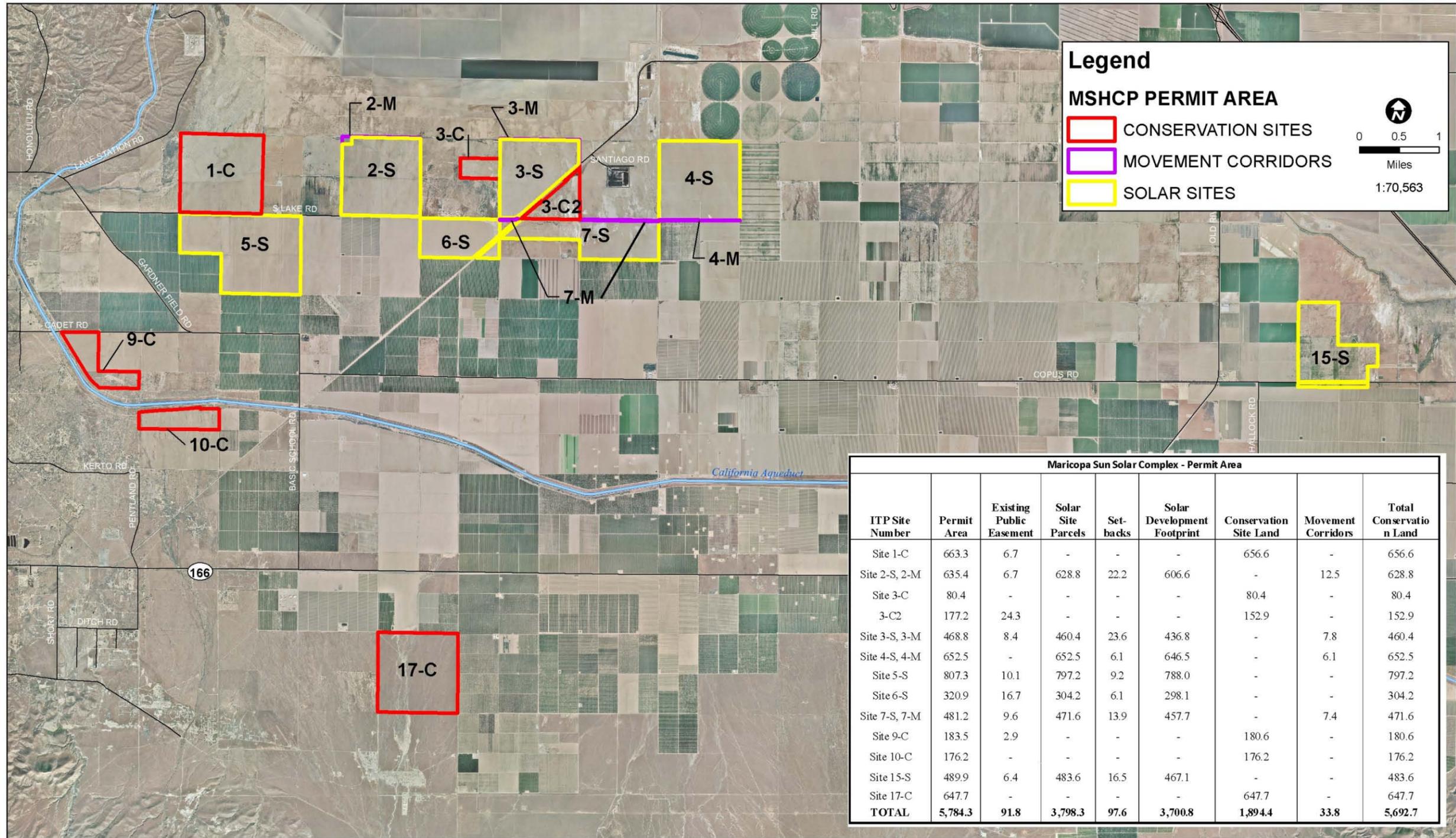
The Maricopa Sun Solar Complex will include: a series of PV panels, inverters, transformers, circuit breakers, metering equipment, switchgear, protective relays, and larger transformers to step up the voltage to match the voltage of the transmission grid at the interconnection point, transmission lines, and operations and maintenance (O&M) buildings adjacent to the solar field. The Project will also include one or more meteorological monitoring stations to track insulation temperature, wind direction, and speed.

¹ Allowable land uses within the A zone are set forth in Sections 19.12.020 and 19.12.030 of the Kern County, California - Code of Ordinances, which includes solar facilities that are permitted on properties zoned for exclusive agricultural use with approval of a conditional use permit (CUP) (County of Kern, 2010a).



REGIONAL LOCATION OF MARICOPA SUN
SOLAR COMPLEX PROJECT AREA,
KERN COUNTY, CALIFORNIA

Figure
1 - 1



Maricopa Sun Solar Complex - Permit Area								
ITP Site Number	Permit Area	Existing Public Easement	Solar Site Parcels	Set-backs	Solar Development Footprint	Conservation Site Land	Movement Corridors	Total Conservation Land
Site 1-C	663.3	6.7	-	-	-	656.6	-	656.6
Site 2-S, 2-M	635.4	6.7	628.8	22.2	606.6	-	12.5	628.8
Site 3-C	80.4	-	-	-	-	80.4	-	80.4
3-C2	177.2	24.3	-	-	-	152.9	-	152.9
Site 3-S, 3-M	468.8	8.4	460.4	23.6	436.8	-	7.8	460.4
Site 4-S, 4-M	652.5	-	652.5	6.1	646.5	-	6.1	652.5
Site 5-S	807.3	10.1	797.2	9.2	788.0	-	-	797.2
Site 6-S	320.9	16.7	304.2	6.1	298.1	-	-	304.2
Site 7-S, 7-M	481.2	9.6	471.6	13.9	457.7	-	7.4	471.6
Site 9-C	183.5	2.9	-	-	-	180.6	-	180.6
Site 10-C	176.2	-	-	-	-	176.2	-	176.2
Site 15-S	489.9	6.4	483.6	16.5	467.1	-	-	483.6
Site 17-C	647.7	-	-	-	-	647.7	-	647.7
TOTAL	5,784.3	91.8	3,798.3	97.6	3,700.8	1,894.4	33.8	5,692.7

Document:1-2_SitePlan_101613.L:\Projects\2009\090160.01\MAPSMXD\October 2013 revisions\1-2_SitePlan_101613.mxd 1/7/2014



SITE PLAN
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure 1 - 2

The lands included in the MSHCP (Permit Area) encompass 5,784.3 acres, which are described as follows:

1. **Permit Area:** The Permit Area is the gross acreage of all parcels, which includes those parcels that will be developed into solar facilities (Solar Sites) and those that will be set aside as conservation areas (Conservation Sites). The Permit Area includes all existing public easements, movement corridors, setbacks, the Solar Development Footprints, and the Conservation Sites. The Permit Area totals 5,784.3 acres. These lands are described in greater detail in Chapter 2.
2. **Solar Sites:** The portion of the Project that will be developed as the “Maricopa Sun Solar Complex.” The Solar Sites encompass 3,798.2 acres, all of which will be placed in conservation easements upon obtaining building/grading permits for solar facilities.
3. **Solar Development Footprints:** Those portions of the Solar Sites that will be developed into solar facilities. The Solar Development Footprints include a reduced area from the Solar Sites because of mandatory setbacks from existing roadways, setbacks from native habitat, the presence of wildlife Movement Corridors, and other necessary reductions in acreage. The Solar Development Footprints encompass 3,700.5 acres.
4. **Movement Corridors:** Corridors located along specified perimeters of Solar Sites that will be enhanced to facilitate the movement of wildlife species. The Movement Corridors encompass 33.8 acres.
5. **Conservation Sites:** These are parcels that will remain in their native state and/or be enhanced to provide habitat for species. These lands will be permanently conserved as mitigation for the Project’s impacts to biological species. These sites encompass 1,894.4 acres.

1.1.1 ENVIRONMENTAL COMPLIANCE

In 2011, an Environmental Impact Report (EIR) for the Maricopa Sun Solar Complex was adopted by Kern County. The EIR identified and evaluated potential environmental impacts associated with implementation of the proposed project. The analysis concluded that pursuant to Sections 15126.2 and 15355 of the California Environmental Quality Act (CEQA), impacts to biological resources would be significant and unavoidable following project compliance with all regulatory, statutory, and mitigation measures. This finding was based on the following: 1) although the project site is mostly devoid of special-status plant and animal species, after the project implementation, growth of natural vegetation on site may encourage special-status species to take advantage of newly formed habitat; 2) solar operations could result in the loss of those species and their habitat; and 3) considered alone, the loss of species and their habitat would not be significant; however, with other renewable energy projects being proposed throughout Kern County, there will be a significant cumulative impact (County of Kern, 2010b). The proposed project would result in take of federally listed species; therefore, incidental take authorization through the Section 10 process of the Federal Endangered Species Act (FESA) is necessary.

1.1.2 STATEMENT OF PURPOSE AND NEED

The purpose of this MSHCP is to outline a conservation strategy that Maricopa Sun, LLC and their affiliates will implement to minimize, avoid, and mitigate, to the maximum extent practicable, the incidental take of species that are currently listed or are likely to become listed by the United States Fish and Wildlife Service (USFWS) during the life of the project, and which may be subject to “take” as defined by the FESA. This MSHCP has been prepared to obtain incidental take authorization under Section 10 of the FESA and Section 2081 of the California Endangered Species Act (CESA) for the proposed Covered Activities outlined in Section 2.0 of this MSHCP.

1.1.3 BIOLOGICAL GOALS AND OBJECTIVES

The biological goals and objectives for the MSHCP are required as part of the USFWS’s five-point policy initiative designed to clarify the elements of an HCP program as they relate to: measurable biological goals, adaptive management, monitoring, permit duration, and public participation (USFWS and Department of Commerce National Oceanic and Atmospheric Administration 2000). An HCP must include biological goals and objectives that set out specific measurable targets that the plan is intended to meet. These targets are based on the best scientific information available, and are used to guide conservation strategies for species covered by the plan (USFWS 2011a). Section 5.1 outlines the biological goals and objectives for this MSHCP.

1.1.4 CONTENT OF THE MSHCP

The MSHCP contains content as required by Section 10 of the FESA and its implementing regulations, as follows:

- An assessment of impacts likely to result from the proposed taking of one or more federally listed species.
- Measures undertaken to avoid, minimize, mitigate, and monitor impacts; the funding that will be made available to implement such measures; and the procedures to address unforeseen or extraordinary circumstances.
- Alternative actions to the taking that were analyzed, and the reasons why such alternatives were not adopted.
- Additional measures that the USFWS may require as necessary or appropriate.

An overview of the organization of this document is provided in Section 1.4.2.

1.2 *Scope of the MSHCP*

1.2.1 PERMIT DURATION

Based on the lifespan of solar equipment and the anticipated phased development of the seven (7) individual Solar Sites (yellow parcels, Figure 1-2), the duration of this MSHCP and the ITP to be issued by the USFWS is 35 years. All sites that are developed within the Maricopa Sun Solar Complex will be subject to the terms and conditions of the MSHCP over the permit duration. A 35-year permit is needed to allow for the phased development of the Project (build-out is anticipated to occur over a maximum 10- to 15-year period) to allow for operations of the solar facilities (estimated at a productive life span of 25 years), and to allow for the decommissioning of the solar facilities. The 35-year term of the ITP will provide adequate time to implement the MSHCP and to achieve the benefits of its conservation program (USFWS 1996).

1.2.2 GEOGRAPHIC SCOPE

Kern County is located on the southern end of California's Central Valley within the San Joaquin Valley. Kern County is surrounded by Kings and Tulare Counties to the north, Inyo and San Bernardino Counties to the east, Ventura and Los Angeles Counties to the south, and Santa Barbara and San Luis Obispo Counties to the west. As of 2010, Kern County had a population of 839,631 people (U.S. Census Bureau 2010). The County consists of approximately 8,202 square miles, and is the state's third largest county in land mass. Kern County also has a diversity of geographic features, which include mountainous areas, agricultural lands, desert areas, and several waterways, including the Kern River, and the California Aqueduct. Elevations in Kern County range from 206 feet above mean sea level (AMSL), to 8,831 feet above AMSL. The San Joaquin Valley consists of sedimentary deposits of alluvial soil that has eroded from the Sierra Nevada and other ranges, with subsequent uplift and faulting that created some hilly terrain.

Kern County is divided into three regions, San Joaquin Valley Region, Mountain Region, and Desert Region. The Project is located in the Valley Region, which is characterized by relatively low rainfall and high average summer temperatures, and generally mild winters. The San Joaquin Valley region consists of four sub-areas: the Northern San Joaquin Valley, the Southern San Joaquin Valley, Westside, and Belridge. The project site is located within the Westside sub-area. This sub-area is situated in the central western portion of Kern County, and is bounded by the Belridge sub-area to the north, San Luis Obispo County to the west, State Highway 166 to the south, and Interstate 5 to the east. The incorporated cities of Taft and Maricopa, and the unincorporated communities of South Taft, Ford City, Taft Heights and McKittrick are all located within the Westside sub-area.

The topography of the Project Permit Area is nearly flat, with little change in elevation. The project site has been previously cultivated for agricultural production and is within the boundaries of Agricultural Preserve No. 12. The Project was granted a certificate of cancellation of the Williamson Act land use contracts (Resolution No. 2011-078) by the Kern County Board of Supervisors on March 29, 2011 (County of Kern 2010b).

1.2.3 COVERED SPECIES

The MSHCP Covered Species include those species that are currently listed under the FESA or that might become listed under the FESA during the permit period, and that may be subject to “take” as defined by the FESA. Therefore, Covered Species, under the MSHCP include: 3 mammal, 1 bird, and 1 reptile species that are identified in Table 1-1. The blunt-nosed leopard lizard (*Gambelia sila*) is designated by the State of California as a fully protected species; this species may also have the potential to inhabit or forage on the project site. Fully protected species are protected from any form of take by the California Fish and Game Code. This MSHCP provides measures for the avoidance of all fully protected species.

**Table 1-1
Species Covered by the MSHCP**

Common Name	Scientific Name	Federal Status ¹	State Status ¹	Other ¹
Covered Mammals				
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE	ST	-
Tipton kangaroo rat	<i>Dipodomys nitratooides nitratooides</i>	FE	SE	-
Nelson’s antelope squirrel	<i>Ammospermophilus nelsoni</i>	-	ST	-
Covered Birds				
Burrowing owl	<i>Athene cunicularia</i>	-	CSC	MBTA
Covered Reptiles				
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE	SE	SFP

¹ THE FOLLOWING ACRONYMS ARE DEFINED AS: CSC = CALIFORNIA SPECIES OF CONCERN, MBTA = MIGRATORY BIRD TREATY ACT, FE = FEDERALLY ENDANGERED, SE = STATE ENDANGERED, SFP = STATE FULLY PROTECTED, AND ST = STATE THREATENED.

1.2.4 COVERED ACTIVITIES

This MSHCP covers all activities within the Permit Area that are related to the construction, operations and maintenance and decommissioning of the Maricopa Sun Solar Complex and its facilities, and implementation of the conservation program described herein for a period of 35 years. After the MSHCP is approved and an ITP is issued, Covered Activities will be authorized to begin on the effective date listed on the permit provided conservation measures are implemented.

Solar electricity generation is the primary activity that will be conducted at the Project facilities. As stated in Section 2.3, Covered Activities will consist of the following phases: (1) pre-construction; (2) construction; (3) operations and maintenance; (4) decommissioning; (5) preservation, enhancement, avoidance, and minimization; and (6) management activities on Conservation Sites. Preservation, enhancement, avoidance, and minimization activities would occur throughout the life of the project. Table 2-2 includes a brief overview of Covered Activities.

1.3 Regulatory Setting

1.3.1 FEDERAL LAWS, REGULATIONS, AND PROGRAMS

Federal Endangered Species Act of 1973 (16 U.S. Government Code [USC], Sections 1531 through 1543)

Congress passed the FESA in 1973 to protect various species of plants, invertebrates, fish, and other wildlife from extinction. Section 9 of the FESA prohibits the taking of listed wildlife species. “Take” is defined broadly to mean harass, harm, hunt, shoot, wound, kill, trap, capture, or collect; or attempt to engage in any such conduct. “Harm” is defined as an act which actually kills or injures wildlife, including those activities that cause significant habitat modification or degradation resulting in the killing or injuring of wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3).

Under Section 10(a)(1)(B) of the FESA, the USFWS may permit, under certain terms and conditions, the incidental take of listed species that may occur pursuant to an otherwise lawful activity. To obtain a Section 10(a)(1)(B) permit, an HCP must be prepared that provides the following information:

- Impacts likely to result from the proposed take of species for which permit coverage is requested.
- Measures undertaken to avoid, minimize, monitor, and mitigate such impacts; funding that will be made available to undertake such measures; and procedures to deal with unforeseen circumstances.
- Alternative actions to the take that were analyzed, and the reasons why such alternatives were not adopted.
- Additional measures the Service may require as necessary or appropriate for purposes of the plan.

The USFWS has adopted a five-point policy initiative designed to clarify elements of the HCP program as they relate to measurable biological goals, adaptive management, monitoring, permit duration, and public participation (USFWS 2000). To be approved by the USFWS, an HCP must satisfy the following additional criteria:

Biological Goals and Objectives: HCPs must include biological goals and objectives that set out specific measurable targets that the plan is intended to meet. These targets are based on the best scientific information available and are used to guide conservation strategies for species covered by the plan.

Adaptive Management: The five-point policy requires an adaptive management approach to ensure adequate funding for the conservation plan and changed circumstances. Adaptive management provides a means to address biological uncertainty and to devise alternative strategies for meeting biological goals and objectives.

Monitoring: Monitoring is a mandatory element of all HCPs under the five-point policy. HCPs must provide for monitoring programs to gauge the effectiveness of the plan in meeting the biological goals and objectives and to verify that the terms and conditions of the plan are being properly implemented. Monitoring programs are also required to ensure that effects associated with the implementation of the HCP remain consistent with those effects analyzed in the HCP. A significant monitoring program is included that will determine the compatibility of species within the developed solar field, as well as provide long-term information of the use of conservation lands by species and the effectiveness of habitat enhancements. There are three monitoring programs associated with this MSHCP: one focuses on monitoring construction and operations activities to assess the effectiveness of avoidance measures and compliance with the Project mitigation measures, another focuses on research that will be conducted to determine the compatibility of solar development and species use of the solar sites, and the third focuses on the monitoring of species' use of the conservation areas so that adaptive management of those lands ensure long-term benefits to Covered Species.

Permit Duration: Under the five-point policy, several factors are used to determine the duration of an ITP, including the duration of the proposed activities and the expected positive and negative effects on Covered Species associated with the proposed duration. The USFWS also considers the level of scientific and commercial data underlying the proposed operating conservation program, the length of time necessary to implement and achieve the benefits of the operating conservation program, and the extent to which the program incorporates adaptive management strategies. It has been determined that a 35-year permit life is warranted for the Project.

Public Participation: Under the five-point policy, the USFWS announced its intent to expand public participation in the HCP process to provide greater opportunity for the public to assess, review, and analyze HCPs and associated documentation (e.g., National Environmental Policy Act [NEPA] documents). As part of this effort, the USFWS has expanded the public review process duration for most HCPs from 30 to 60 days (United States Code 1973). HCPs that require an Environmental Impact Statement have a 90-day public review period. The MSHCP has a 90-day public review period.

National Environmental Policy Act

The purpose of the NEPA is to ensure that federal agencies examine the environmental impacts of their actions (in this case deciding whether to issue a permit) and to utilize public participation. NEPA serves as an analytical tool to assess direct, indirect, and cumulative impacts of a proposed project, and alternatives to help the USFWS decide whether to issue a permit. The analysis conducted is provided in either an environmental assessment (EA) or an environmental impact statement (EIS). The issuance by the USFWS of an ITP under Section 10 of the FESA constitutes a federal action. Therefore, the USFWS must complete NEPA documentation for each HCP as part of the permit application process (CEQ 2011).

San Joaquin Valley Upland Species Recovery Plan

The proposed project is located within the coverage area of the recovery plan for upland species of the San Joaquin Valley, which covers 34 species of plants and animals (USFWS 1998). The primary objective of that plan is the recovery of 11 endangered and threatened listed species, along with protection and long-term conservation of candidate species and species of special concern. These 11 species consist of 5 federally endangered plants (California jewelflower, palmate-bracted bird's-beak, Kern mallow, San Joaquin woolly-threads, and Bakersfield cactus), 1 threatened plant (Hoover's woolly-star; but see USFWS 2003b), and 5 endangered animals (giant kangaroo rat, Fresno kangaroo rat, Tipton kangaroo rat, blunt-nosed leopard lizard, and San Joaquin kit fox). In addition, 23 candidates or species of concern are addressed. The ultimate goal of this recovery plan is to delist the 11 endangered and threatened species and ensure the long-term conservation of the 23 candidates and species of concern. An interim goal is to reclassify the endangered species to threatened status. The USFWS is responsible for the implementation of the recovery plan (USFWS 1998).

1.3.2 STATE LAWS AND REGULATIONS

California State Fish and Game Code (Sections 3503 and 3503.5.)

Under these sections of the Fish and Game Code, the project proponent is not allowed to conduct activities that would result in the taking, possessing, or destroying of any bird-of-prey; taking or possessing of any migratory non-game bird as designated in the Migratory Bird Treaty Act; or the taking, possessing, or needless destroying of the nest or eggs of any raptor or non-game bird protected by the Migratory Bird Treaty Act, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800.

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

The Fish and Game Code restricts the CDWF from authorizing take of fully protected species, except for scientific research, under Sections 3511 (Fully protected birds), 4700 (Fully protected mammals), 5050 (Fully protected reptiles and amphibians), and 5515 (Fully protected fish) stating that “no provision of this code or any other law shall be construed to authorize this issuance of permits or licenses to take any fully protected [birds], [mammals], [reptiles or amphibians], [fish]...” Under this MSHCP, potential impacts due to Covered Activities are fully analyzed and measures to avoid take of California fully protected species are provided.

California Endangered Species Act (Fish and Game Code 2050 et seq.)

The CESA provides mechanisms to obtain incidental take coverage for projects that would likely result in the incidental killing or injury of a state listed species through the issuance of a Section 2081(b) permit or a 2080.1 consistency determination (CDFG 2011a). An ITP application to the California Department of Fish and Wildlife will be submitted to obtain a State 2081(b) ITP.

California Environmental Quality Act

The CEQA requires that a state or local lead agency perform an analysis of the significance of the impacts of a given project on the quality of the human environment. If the project's impacts are not significant, or the project proponent can mitigate the impacts below significance, the lead CEQA agency can file a "Negative Declaration" or a "Mitigated Negative Declaration." If the project proponent cannot mitigate the impacts of the project to below a level of significance, the lead CEQA agency must develop an EIR that analyzes the proposed project and other alternatives. This process provides for public participation and comment in the development of alternatives (California Natural Resources Agency [CNRA] 2011). In 2011, an EIR for the Maricopa Sun Solar Complex was adopted by Kern County (County of Kern 2010b).

California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR)

DOGGR is a state agency responsible for supervising: the drilling, operation, maintenance, plugging, and abandonment of oil, gas, and geothermal wells. The DOGGR's regulatory program promotes the sensitive development of oil, natural gas, and geothermal resources in California through sound engineering practices, prevention of pollution, and implementation of public safety programs. To implement the regulatory program, DOGGR requires avoidance of building over or near plugged or abandoned oil and gas wells, or requires the remediation of wells to current DOGGR standards (County of Kern 2010b).

1.3.3 REGIONAL/LOCAL REGULATIONS AND STANDARDS

Kern County General Plan

The Kern County General Plan identifies the federal, state, and local statutes, ordinances, or policies that govern the conservation of biological resources that must be considered by Kern County during the decision-making process for any project that could impact biological resources. The Land Use/Conservation/Open Space Element, Safety Element, and Energy Element of the Kern County General Plan states that the element provides for a variety of land uses for future economic growth, while also assuring the conservation of the County's agricultural, natural, and resource attributes (County of Kern 2006).

Draft Valley Floor Habitat Conservation Plan (VFHCP)

The program area is within the plan area proposed for inclusion within the Valley Floor HCP (VFHCP), which is in progress by the County of Kern (County of Kern 2006). Although the VFHCP is not currently adopted, the most recent draft did not provide coverage for solar energy projects. The proposed VFHCP is a long-term program designed to conserve federal and state protected species, and/or other species of concern, and to provide a mechanism for ensuring compliance with FESA and CESA. Although the VFHCP is not an approved plan, it is expected that Kern County will obtain approval of the plan within the proposed life of the Project; therefore, this HCP considered the policies that have been proposed for inclusion within the VFHCP to ensure that no conflicts would occur between this HCP and the proposed plan.

1.4 Overview of the MSHCP

1.4.1 PROCESS

Section 10 take permits have three primary phases: (1) the HCP development phase; (2) the formal permit processing phase; and (3) the post-issuance phase. During the HCP development phase, a plan that is intended to integrate the proposed Project and its activities with the protection of listed species will be prepared. An HCP submitted in support of a permit application must include the following information:

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested.
- Measures undertaken to avoid, minimize, monitor, and mitigate such impacts, the funding that would be made available to undertake such measures, and the procedures to deal with unforeseen circumstances.
- Alternative actions to the taking that were analyzed, and the reasons why the such alternatives were not adopted.
- Additional measures the USFWS may require as necessary or appropriate for purposes of the plan.

The HCP development phase concludes, and the permit processing phase begins when a complete application package is submitted to the appropriate permit-issuing office. A complete application package consists of the following: 1) an HCP; 2) an Implementing Agreement (IA); 3) a permit application; and 4) payment of applicable application fees. The USFWS must also publish a Notice of Availability for the HCP and supporting documents in the *Federal Register* to allow for public comment. The USFWS also prepares an Intra-USFWS Section 7 Biological Opinion, and prepares a Set of Findings, which evaluates the permit application in the context of permit issuance criteria. An EA or EIS serves as the USFWS's record of compliance with NEPA, which is released for a 60-day to 90-day public comment period. No further NEPA review is required. An implementing agreement is required for HCPs unless the HCP qualifies as a low-effect HCP. The USFWS issues a permit upon a determination that all requirements for permit issuance (50 CFR 17.22(b) and 17.32(b)) has been met.

During the post-issuance phase, the Administrator and other responsible entities (e.g., Developers) implement the HCP, while the USFWS monitors the Administrator's compliance, as well as the long-term progress and success of the HCP. The public is notified of permit issuance by means of the *Federal Register*.

1.4.2 DOCUMENT ORGANIZATION

The MSHCP is arranged in 11 sections, with 9 through 11 being the Literature Cited, List of Preparers, and Appendices. A glossary of terms used throughout this MSHCP may be found in Appendix A. A brief overview of Sections 1 through 8 is included below:

Section 1.0, Introduction, provides a general overview of the background of the MSHCP, scope of the MSHCP, regulations that apply to the MSHCP, and an overview of the document organization.

Section 2.0, Project Description, includes a detailed description of the Project and its phasing, outlines the lands, describes the activities and persons covered under the Project, describes reporting requirements during construction activities, and lists mitigation measures that are included in the Project to reduce its impacts.

Section 3.0, Environmental Setting and Biological Resources, provides a description of the Project, including detailed descriptions of the sites, the baseline biological conditions present on the sites upon which the impact analysis and conservation program were formulated, and descriptions of standard avoidance and minimization measures that will be instituted as integral components of the Project. This section also includes a detailed description of the species that are covered under the MSHCP and criteria used to evaluate their inclusion in the MSHCP.

Section 4.0, Biological Impacts and Levels of Take, analyzes the impacts of the Project on biological species, and quantifies the potential levels of take.

Section 5.0, Conservation Program, details the MSHCP's goals and objectives, strategies to achieve the goals, effectiveness monitoring strategies, adaptive management strategies, performance and success criteria, and compliance monitoring and reporting requirements.

Section 6.0, Monitoring Plan, discusses compliance monitoring, effectiveness of the MSHCP monitoring strategies, and monitoring for the effects of the MSHCP on Covered Species.

Chapter 7.0, Reporting, describes the various reporting that will accompany monitoring of Covered Activities, the effectiveness of the MSHCP, and effects of the MSHCP.

Chapter 8.0, Plan Implementation, describes changed circumstances and unforeseen circumstances considered by the MSHCP, as well as the process for making minor and major amendments to the MSHCP.

Section 9.0, Project Alternatives, discusses alternatives to the Project that were considered to avoid take.

Section 10.0, Funding, details the cost of implementing the MSHCP, and methodology used to determine the cost; and discloses how the MSHCP will be funded, including disclosure of assurances for funding.

2.0

PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 *Project Description*

The purpose of the Project is to construct and operate a solar complex. The need for ITP coverage under the FESA is necessary and is the intent of this MSHCP. Activities included in the MSHCP (Covered Activities) allow for: (1) pre-construction, construction, operations and maintenance, and decommissioning activities within Solar Sites; (2) management and maintenance activities associated with Movement Corridors and Conservation Sites, including monitoring and reporting activities; and (3) activities associated with implementation of the conservation program specified in this MSHCP. For the purposes of this MSHCP, the activities and their impacts described here represent the maximum scenario. It is anticipated that actual realized activities and their impacts will be less than have been indicated here.

The Project broadly includes pre-construction, construction, operation and maintenance, and decommissioning of PV power generating facilities (Solar Development Footprints) on 3,798.2 acres. Complete build-out of the Maricopa Sun Solar Complex will produce up to 700 MW of electricity. The Project is located in the southwest portion of unincorporated Kern County (see Figure 1-1). The Project includes all actions that are necessary to construct, operate and maintain, and decommission the solar power generating facilities, as well as those necessary to manage habitat and conserve native species.

2.1.1 PROJECT PHASING

Construction of the first solar development for the Maricopa Sun Solar Complex is planned to begin immediately after procurement of all permits (which includes this MSHCP) and approval of required plans. Construction of solar facilities on all Solar Sites is anticipated to be completed over an 8- to 10-year period from the commencement of the initial development. Unknown constraints could extend the development phase to a 10- to 15-year period. It is anticipated that development of each individual solar facility within the Maricopa Sun Solar Complex will take 9 to 18 months, depending on the size of the solar facility, weather conditions, labor and equipment availability, and time of year. There is a high potential for multiple solar developers to be installing solar facilities at various sites simultaneously. The operational life of each solar facility is anticipated to span a period of up to 25 years, during which time, routine operations and maintenance activities and repairs will be implemented. Decommissioning will occur prior to expiration of the MSHCP.

The establishment of conservation easements on conservation lands and the initiation of management actions on those lands will be phased to coincide with the development of Solar Sites. Phasing of the establishment of the conservation easements will be accomplished such that each solar development will be offset with compensation obligations prior to initiation of development. Detailed information on the phasing of conservation and solar development is provided in Chapter 8, Section 8.2.

2.2 *Permit Area*

The Permit Area of this MSHCP encompasses a total of 5,784.3 acres and is designated as (1) Solar Sites, which consist of 3,798.2 acres (Solar Development Footprint, mandatory setbacks, and Movement Corridors) and (2) Conservation Sites, which encompass 1,894.4 acres. The Permit Area is illustrated on Figure 1-2. Table 2-1 lists all lands within the Permit Area by site number and Assessor's Parcel Number and the acreage of each site; and includes locations of the sites within the Permit Area by their physical locations within the Public Land Survey System indicated by Township, Section and Range within the Mount Diablo Base and Meridian (MDBM) and San Bernardino Base and Meridian (SBBM). Appendix B contains detailed maps showing the parcel boundaries, locations of public easements, mandatory setbacks, Movement Corridors, and locations where species covered in this MSHCP (Covered Species) and other special status species were found on the sites and on lands adjacent to the sites.

The Permit Area, Solar Sites, Solar Development Footprints, Movement Corridors, and Conservation Sites are all integral components of the Maricopa Sun Solar Complex. These Project components are described as:

Permit Area: The Permit Area is the gross acreage of all parcels, which includes those parcels that will be developed into solar facilities (Solar Sites) and those that will be set aside as conservation areas. The Permit Area includes all existing public easements, movement corridors, setbacks, the Solar Development Footprints, and the Conservation Sites. The Permit Area totals 5,784.3 acres (Table 2-1).

Solar Sites: The Solar Sites are lands within the Permit Area on which solar facilities will be built and include the Movement Corridors. Acreages of Existing Public Easements occurring on each parcel have been subtracted from the acreages of the Solar Sites (Table 2-1). The Solar Sites encompass 3,798.2 acres. The Solar Sites will be placed into permanent conservation easements concurrently with the acquisition of grading or building permits (whichever is obtained first) for each Solar Site, and will be managed in perpetuity for the benefit of Covered Species once the Solar Site has been decommissioned.

Existing Public Easements: Existing Public Easements include lands within established public right-of-ways occurring along the Project boundary. Existing Public Easements include public roadways, transmission line corridors, and a railroad line. Fifty-foot setbacks are established between all Existing Public Easements and the Project boundary. The total acreage of all Existing Public Easements is 91.8 acres. Some impacts will be assessed within Existing Public Easements as described below (Section 2.3) and in Chapter 4.

Solar Development Footprints: The Solar Development Footprints are those specific portions of the Solar Sites on which solar facilities will be installed. The acreage of the Solar Development Footprints is equal to the Solar Sites minus Movement Corridors and mandatory setbacks (Table 2-1). The total acreage of the Solar Development Footprints is 3,700.5 acres.

**Table 2-1
Maricopa Sun Solar Complex: Permit Area**

MSHCP Site Number	APN	Township, Range, Section	Permit Area	Existing Public Easement	Solar Sites³	Setbacks	Solar Development Footprints⁴	Conservation Site Land	Movement Corridors⁵	Total Conservation Land⁶
Site 1-C	220-120-(14-15)	T.32S., R.25E., Sec.19 ¹	663.3	6.7	-	-	-	656.6	-	656.6
Site 2-S, 2-M	220-120-(18-19)	T.32S., R.25E., Sec.21 ¹	635.4	6.7	628.8	22.2	606.5	-	12.5	628.8
Site 3-C	220-110-10	T.32S., R.25E., Sec.22 ¹	80.4	-	-	-	-	80.4	-	80.4
Site 3-C2	220-110-08	T.32S., R.25E., Sec.23 ¹	177.2	24.3	-	-	-	152.9	-	152.9
Site 3-S, 3-M	220-110-08	T.32S., R.25E., Sec.23 ¹	468.8	8.4	460.4	23.6	436.8	-	7.8	460.4
Site 4-S, 4-M	295-040-(30-31)	T.32S., R.26E., Sec.19 ¹	652.5	-	652.5	6.1	646.4	-	6.1	652.5
Site 5-S	220-170-(01-02, 05, 07)	T32S., R.25E., Sec. 29 & 30 ¹	807.3	10.1	797.2	9.2	788	-	-	797.2
Site 6-S	220-130-01	T.32S., R.25E., Sec.27 ¹	320.9	16.7	304.2	6.1	298.1	-	-	304.2
Site 7-S, 7-M	220-130-(02,12)	T.32S., R.25E., Sec.25&26 ¹	481.2	9.6	471.6	13.9	457.7	-	7.4	471.6
Site 9-C	220-201-02, 220-050-42	T.12N., R.23W., Sec.29 ²	183.5	2.9	-	-	-	180.6	-	180.6
Site 10-C	220-201-05	T.12N., R.23W., Sec.33 ²	176.2	-	-	-	-	176.2	-	176.2
Site 15-S	295-130-25	T.32S., R.27E., Sec.33 ¹	489.9	6.4	483.5	16.5	467	-	-	483.5
Site 17-C	239-150-11	T. 11N., R.23W., Sec.13 ²	647.7	-	-	-	-	647.7	-	647.7
TOTAL			5,784.3	91.8	3,798.2	97.6	3,700.5	1,894.4	33.8	5,692.6

1 Mount Diablo Base and Meridian

2 San Bernardino Base and Meridian

3 Solar Sites = Permit Area - Existing Public Easement

4 Solar Development Footprint = Solar Site - Setback

5 Acreage of Movement Corridors is included in the acreage of associated Solar Sites

6 Total Conservation Land = Sum of all Solar Sites (including Movement Corridors) and Conservation Sites – Existing Public Easements

Movement Corridors: Movement Corridors are areas of land that were identified as being necessary for the movement of species between areas of natural habitat and to promote colonization within the region. These corridors of land will not be developed, will be managed to aid in the movement of species, and will be interspersed with developed parcels. Conservation easements on Solar Sites will be included with the associated Movement Corridor, but Movement Corridors will be managed for Covered Species immediately upon establishing the conservation easement. The total acreage of the Movement Corridors is 33.8 acres. These corridors are located along specified perimeters of the Solar Sites, but are not within the Solar Development Footprints (Figure 2-1). These corridors will be enhanced by installation of dens, perching posts, and changes in topographic relief to facilitate the movement of species and to provide connections between natural habitat patches. Movement Corridors and their role in the overall conservation strategy, including construction details such as their widths, fencing, enhancement and maintenance, and content are discussed in further detail in the Conservation Plan (Chapter 5).

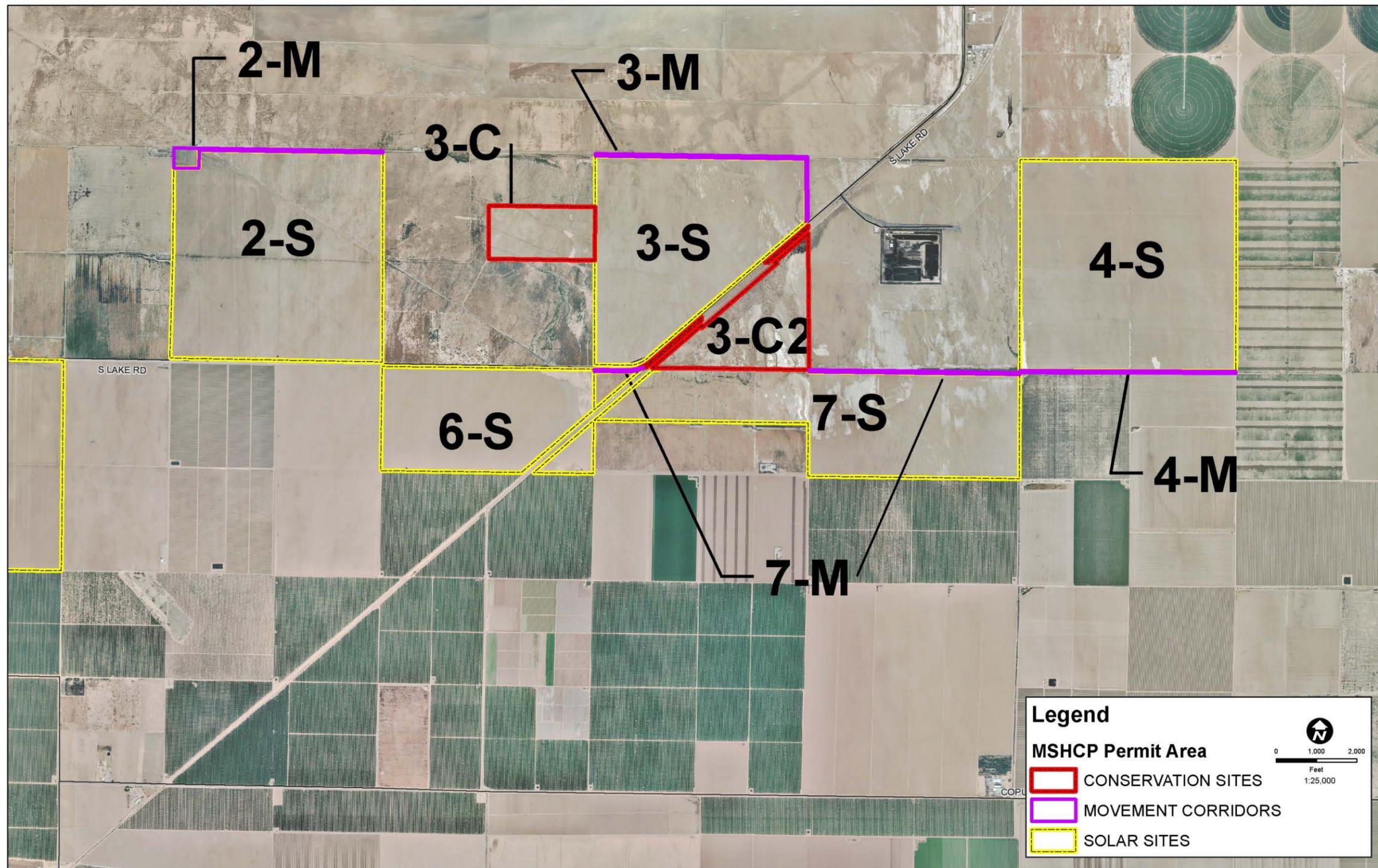
Conservation Sites: Conservation Sites are those lands identified in special studies and during environmental review of the Project as having value as habitat for Covered Species. Conservation easements will be recorded on these lands, which total 1,894.4 acres, to permanently protect the lands for the benefit of Covered Species. These parcels will remain in their native state, or if previously disked, will be enhanced to benefit species as described in detail in Section 5.3. These lands will be conserved and managed in perpetuity as mitigation for the Project's impacts to species.

Total Conservation Land: The Total Conservation Land is the sum of all acreages of Solar Sites (which includes Movement Corridors) and Conservation Sites that will be permanently conserved as mitigation for project impacts to species. These lands will be placed into conservation easements and managed in perpetuity for the benefit of Covered Species. The management of conservation easements for the benefit of Covered Species on solar development lands will take effect once the solar facilities are decommissioned (Table 2-1). All other conservation lands will be managed for the benefit of Covered Species immediately upon recordation of the conservation easements on those lands.

The project sites are primarily comprised of undeveloped and vacant agricultural land, and have minimal relief. Surrounding land uses are both active and inactive agricultural land. Surrounding land use designations include intensive and extensive agriculture designations, lands designated as flood hazard areas, lands designated for public facilities; lands designated for the protection of important watershed recharge areas or wildlife habitat, or having value as a buffer between resource areas and urban areas, and lands designated for industrial uses. The surrounding land use designations are shown in Figure 2-2.

2.3 Covered Activities

Solar electric generation will be the primary activity conducted at the Project's facilities. Activities covered by this MSHCP (Covered Activities) include those actions necessary to construct, operate, and maintain the Maricopa Sun Solar Complex and its facilities, as well as

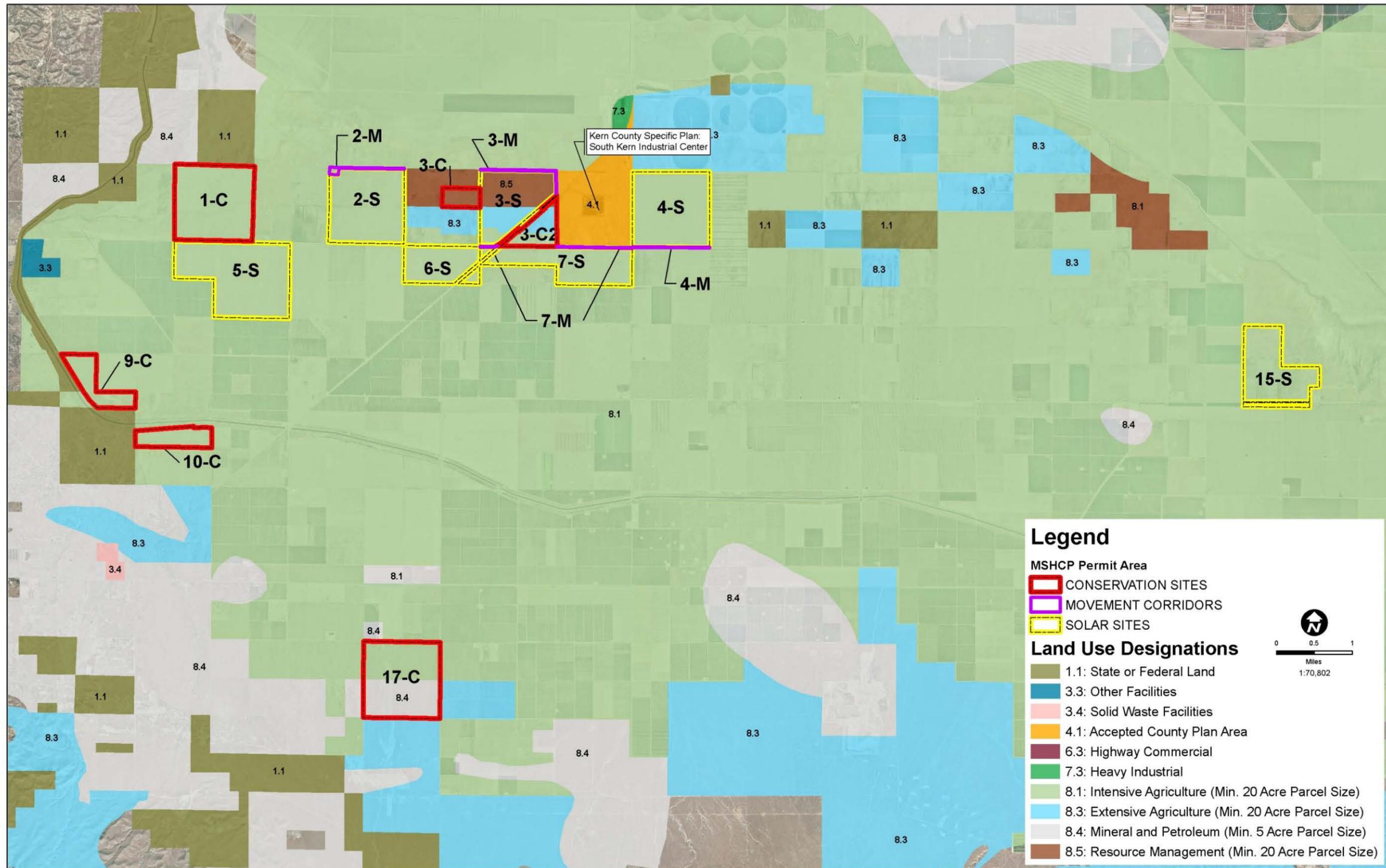


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MOVEMENT CORRIDORS WITHIN MSHCP PERMIT AREA,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
2 - 1



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LAND USE DESIGNATION MAP,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
2 - 2

activities necessary to remove those facilities during decommissioning and to conserve native species within the Permit Area. Many activities will be conducted during multiple phases of the Project, while other activities will be confined to a single phase. In each case, described activities represent the maximum possible activity level and resulting impacts. Actual activity and impact levels are anticipated to be less than described here.

A variety of activities must occur to prepare the Solar Sites for construction. Site preparation during the pre-construction phase consists of installation of exclusion and avoidance areas, surveying and staking the Solar Sites and site fencing, limited removal of existing vegetation, minimal site grading, compaction of soils, establishment of laydown and storage areas, and other activities that prepare the sites for the installation of solar facilities. Activities associated with the construction phase of the Project include some of the activities that also occur during the pre-construction phase, such as equipment and materials delivery, site grading and compaction, site fencing installation, waste management, and vegetation management. Activities associated specifically with construction will also occur, including construction of operations and maintenance buildings, and construction of solar arrays. During the operations and maintenance phase, on-site activities will be minimal, but could include site and fence inspections, meter reading, and PV panel cleaning. Tasks that will be performed during the decommissioning phase include removal of fencing, solar arrays and all other related facilities. Actions associated with conservation lands include habitat enhancement, vegetation control, barbed-wire fencing installation, and biological effectiveness studies.

Covered Activities are summarized by phase in Table 2-2 and described below. These activities are not necessarily listed in the order in which they will be performed. These descriptions provide the basis for the quantification of take and for developing the impacts assessment. Minimization, avoidance, and mitigation measures will be implemented to ensure that take of Covered Species is minimized to the extent possible. Examples of minimization, avoidance, and mitigation measures are pre-activity surveys conducted 14 days prior to the commencement of any project activities, daily pre- and post-activity sweeps conducted prior to commencement of and upon completion of all daily work, and daily monitoring of each work crew. Minimization, avoidance, and mitigation measures are discussed in detail in Section 2.3.5 and in Chapter 6. After MSHCP approval and ITP issuance, Covered Activities would be authorized to begin on the effective date listed on the permit.

2.3.1 PRE-CONSTRUCTION ACTIVITIES

Surveying and Staking

Prior to construction, site surveys will be performed to locate various property corners and property boundaries, and to complete topographic and elevation mapping. Surveying will also be needed to establish locations of solar arrays, staging areas, fencing, underground conduits, and other components of the Project. Surveying will be completed by car or truck and by walking. Surveyed areas will be delineated using stakes. This activity will occur on the Solar Sites, thus disturbances from surveying can be expected to occur on 3,798.2 acres. In addition, surveying and staking will be needed to establish the locations of perimeter fencing on the Conservation Sites. Disturbance associated with surveying and fence installation on the Conservation Sites is estimated at 10 feet wide by 92,947.3 feet, or 21.3 acres.

**Table 2-2
Occurrences of Covered Activities by Phase**

Activity*	Pre-construction	Construction	O&M**	Decommission
Clearing, grading, leveling, and Compacting	X	X		
Construction of O&M** buildings and metering stations		X		
Construction of solar arrays, modules, and electrical assemblies		X		
Delivery of materials and equipment	X	X	X	X
Demarcation of Solar Development Footprint	X			X
Drainage, erosion and dust control	X	X	X	X
Establishing and maintaining staging area(s)	X	X	X	
Geotechnical drilling and testing	X			
Grading and compacting of roadways	X	X	X	
Installation of fencing, gates, and parking areas	X	X	X	
Installation of signs	X	X	X	
Landscaping/site enhancement		X	X	
Managing waste (non-hazardous & hazardous)	X	X	X	X
Meter reading			X	
Monitoring alarms/security			X	
Operation and maintenance of solar modules			X	
Paving of access road(s) and building areas		X	X	
Post construction soil treatment		X	X	
Reconductoring and installation of overhead AC transmission line system		X		
Removal of access roads and fencing				X
Removal of buildings, foundation, and concrete pads				X
Removal of electrical cabling				X
Removal of solar systems				X
Surveying and staking	X	X		X
Testing, plugging and abandoning wells	X			
Vegetation and weed management			X	X
Habitat management, enhancement, and research***		X	X	X

* Activities not necessarily list in the order that they will occur

** O&M = operations and maintenance

*** Habitat management, enhancement, and research are independent of solar operations and are discussed the Habitat Management Plan (Appendix C).

Clearing, Grubbing, Grading, and Leveling

Clearing, grubbing, grading, and leveling will occur within all of the Solar Sites and will result in disturbance to 3,798.2 acres of land.

Each Solar Site will be cleared or grubbed of vegetation to prepare for grading activities. Vegetation clearing and grubbing are anticipated to be minimal, because of the lack of vegetation present on the sites due to repeated disking operations. Tools used for clearing may consist of chainsaws, wood chippers, stump grinders and other grubbing equipment, agricultural disks and ring-rollers, and other tools and equipment. Minimal site grading is anticipated for most areas, and will be dependent upon each specific site's topography.

Soil will not be imported or exported from any site. Importing soils can introduce noxious or invasive weeds and importing or exporting soils can change the surface soil types and character. These changes can alter the potential for the sites to recover after decommissioning and reduce their long-term value as conservation lands. The sites will not be laser leveled nor will vast amounts of soil be moved to accomplish leveling. During grading and compacting activities, water trucks will be operated to minimize airborne particles and dust.

After completion of grading, a ring roller will be used to provide a relatively level and compact surface for the Solar Sites. These activities will involve fueling construction equipment, which could require the transport, storage, and use of hazardous materials. Hazardous materials used in conjunction with clearing, grubbing and leveling activities will be used in conformance with applicable regulations.

Delivery of Materials and Equipment

Construction materials, including: concrete, pipe, fencing, wire and cable, fuels, reinforcing steel, building materials, and small tools and consumables will be delivered to the sites by truck. PV modules and other materials for the solar facilities will be manufactured off site, and will also be delivered by truck. Although the destination of the delivery of materials and equipment will be storage yards and staging areas established on each Solar Site, the distribution of materials and equipment to each solar array will occur over the entirety of the Solar Development Footprints. While most of the deliveries of materials and equipment will occur during the construction phase, these activities will also occur during the pre-construction phase. Because materials and equipment will be delivered to all Solar Development Footprints, this activity will result in disturbance to 3,700.5 acres of land.

Demarcation of Solar Development Footprint

The "no-construction areas" will be delineated by marking avoidance areas between the Solar Development Footprints that will be under construction and lands on which no construction will take place. These barriers will be established to keep construction activities confined to the Solar Development Footprints and to minimize and avoid impacts to adjacent native lands.

Temporary construction fencing will consist of T-post type structural members with ropes and flagging located greater than three feet above the ground. Alternatively, standard construction fencing consisting of orange plastic webbed fencing material may be used. Installation of this fencing will require setbacks of various distances at some locations, such as mandatory 50-foot setbacks from Existing Public Easements. Temporary construction fencing will be removed when construction activities are completed, or once permanent security fencing or barrier fencing is in place. Trucks, forklifts, and other equipment may be used to deliver and distribute fencing and materials to the various locations within each Solar Site.

Drainage, Erosion, and Dust Control

Prior to issuance of grading permits, the solar operator will submit a Stormwater Pollution Prevention Plan (SWPPP) to the Kern County Planning and Community Development Department. The SWPPP will describe Best Management Practices (BMPs) that will be implemented for the purpose of preventing construction pollutants from contacting stormwater, and for preventing products of erosion from moving off site and into receiving waters or onto adjacent habitat areas. Equipment to deliver and distribute the SWPPP materials around the project site will be as determined in the SWPPP. The requirements of the SWPPP will be incorporated into design specifications and construction contracts.

Although it is premature to develop individual site SWPPPs, because the Solar Site designs are not complete, recommended BMPs for the construction phase will include the following:

- Eliminating non-stormwater discharges;
- Preventing, controlling, and cleaning up spills;
- Cleaning vehicles and equipment routinely;
- Maintaining and repairing vehicles and equipment routinely;
- Following standard procedures for outdoor equipment operations;
- Ensuring proper waste handling and disposal;
- Following standard procedures for building and grounds maintenance;
- Following standard procedures for building repair and construction;
- Following standard procedures for parking/storage area maintenance;
- Stockpiling and disposing of demolition debris, concrete, and soil properly;
- Protecting existing storm drain inlets and stabilizing disturbed areas;
- Implementing erosion controls;
- Properly managing construction materials; and
- Managing waste, aggressively controlling litter, and implementing sediment controls.

The Developer will prepare a drainage plan that is designed to minimize runoff and surface water pollution, and will include engineering recommendations to minimize the potential for impeding or redirecting 100-year flood flows. The final design of the solar arrays will include 1.0 foot of freeboard between the calculated base flood elevation (BFE) and the bottom support rail of the solar panels or the finished floor of any permanent structures. Solar Sites may be graded to direct potential flood waters into channels adjacent to the existing and proposed right of ways, without increasing the water surface elevations more than one foot or as required by Kern County's Floodplain Ordinance. The drainage plan will be prepared in accordance with the Kern County

Grading Code and approved by the Kern County Engineering, Surveying and Permitting Services, Floodplain Management Section prior to the issuance of grading permits. A backhoe and other necessary equipment will be utilized (County of Kern 2010a).

Disturbance associated with installing flood control features will occur within the Solar Development Footprints and will be confined within the existing 3,700.5-acre disturbance footprint.

Fugitive dust will be managed using water delivered by spray trucks, and chemical dust preventatives such as lignin sulfate. Grizzlies, gravel pads, or other similar devices meeting the requirements of San Joaquin Valley Air Pollution Control Board Regulation 8041 will be provided to clean vehicle wheels and prevent track-out prior to exiting construction areas. The most prevalent means of dust control will be the application of water, but the longer term and more effective methods will be used on limited areas where there is a high volume of traffic and where dust management is more critical. Drainage, erosion, and dust control are anticipated to be needed within all areas of the Solar Development Footprints, thus 3,700.5 acres are anticipated to be impacted by these activities.

Establishing and Maintaining Staging Areas

Staging areas will be needed for construction management buildings or trailers, to receive shipments, and to inspect and store parts and materials for the solar facilities. During the pre-construction and/or construction phases on each Solar Site, a paved staging area not exceeding 5 acres total will be established inside of the Solar Development Footprint, resulting in a maximum total of 35 acres of staging areas for the seven Solar Sites. Staging areas may be enclosed with 8-foot tall perimeter security fencing (6-foot tall chain-link topped with 2 foot of barbed wire). If fenced, staging area fencing shall be permeable to wildlife to avoid entrapment in the event that staging area gates are left open during the day. Staging areas will be used for storage of construction materials, PV models, and for inspection and storage of parts and materials for the solar facilities. All materials (including pallets and recycle material) shall be spaced to prevent creating attractive sheltering areas for Covered Species (see mitigation measures in Section 2.3.5). The staging areas will be used throughout the construction phase and may remain in place and in use after completion of the construction phase. Alternatively, if no longer needed, staging areas may be decommissioned and replaced with solar arrays. If left in place during the operations and maintenance phase, the staging areas would be used as either parking lots, equipment storage areas, or shipping and receiving areas.

Vehicle tire grates, straw bales, and construction demarcation fencing will be installed prior to construction and as necessary at entrances to the staging areas to ensure compliance with environmental protection measures. Access roadbeds to the staging areas will typically be up to 20 feet wide and consist of compacted earth surfaced with gravel or compacted soil. These associated roadways are anticipated to be relatively short because the staging areas will be placed as close to existing paved access roads as possible. An average maximum distance of 0.25 mile of access road will be needed to each of the 7 staging areas. Thus a total of 35 acres of paved staging areas (up to 5 acres per site) and 6.3 acres (0.9 acres per site) of graveled or compacted soil roadways will be required.

This description is considered a maximum level of impact. The potential exists for fewer staging areas, replacing staging areas with solar arrays, no batch plants, non-paved surfaces, no fencing, and other reductions in staging area improvements and accoutrements.

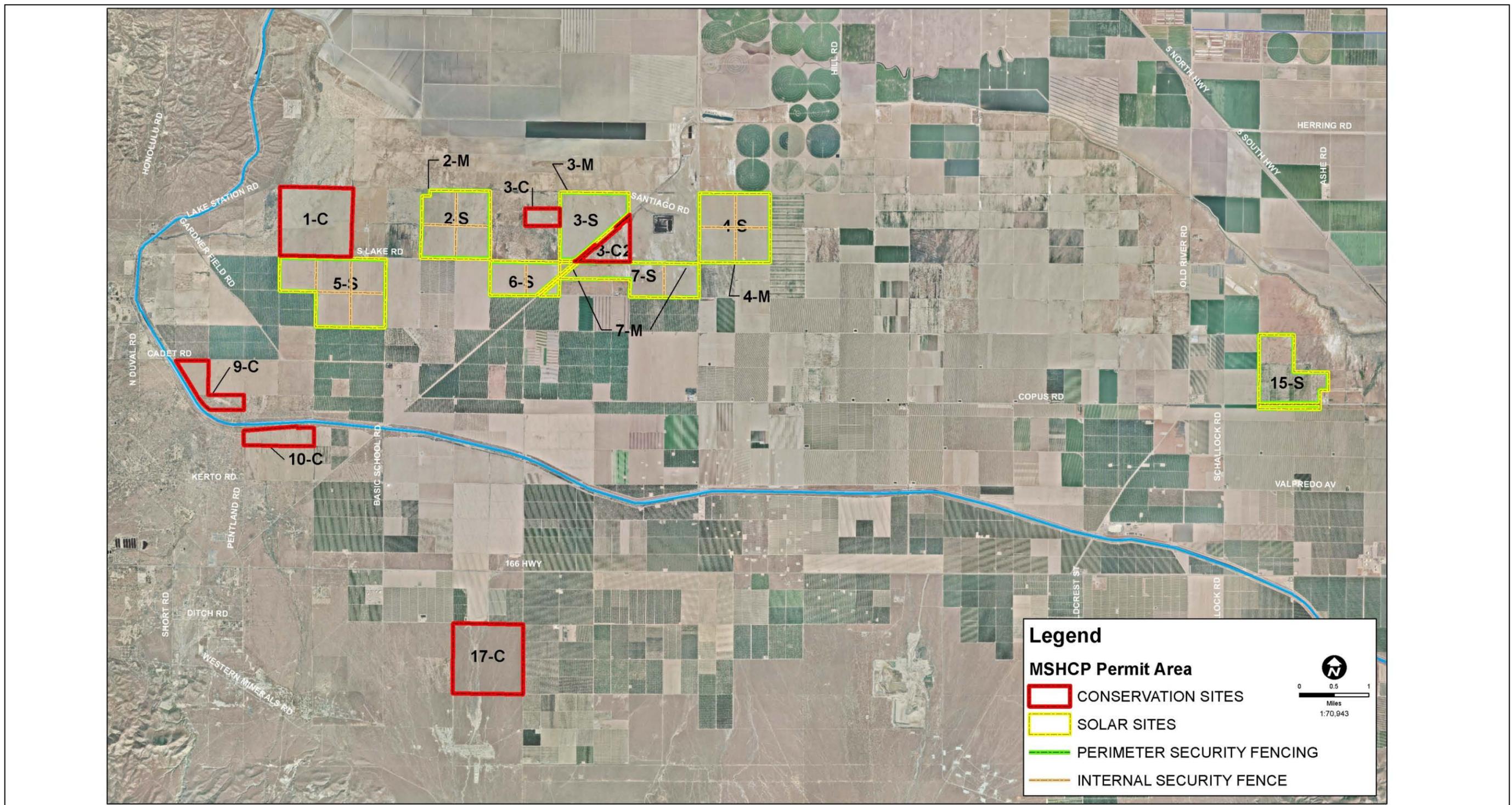
Installation of Fencing, Gates, and Parking Areas

Prior to construction, the Solar Sites will be enclosed with perimeter security fencing composed of up to 8-foot tall chain-link fencing topped with barbed wire for a total height of up to 10 feet. Perimeter security fencing will consist of a total of 165,273.2 linear feet (~31.3 linear miles). Depending on the preference of each individual Developer, security fencing may surround each individual development site. A maximum of additional fencing separating individual solar developments within the Solar Development Footprint will include 39,600 linear feet (7.5 linear miles). If each individual solar development does remain fenced throughout the course of the Project, a maximum of 204,863.2 linear feet (~38.8 linear miles) of security fencing will be in place at any given time on the Solar Sites.

The security fencing shall be permeable to movement of wildlife. The fencing will remain in place during the operation of the solar facilities to provide security, and will be removed during decommissioning, at which time the fencing will be replaced with permanent perimeter fencing constructed of three or four strand barbed wire as described for other conservation lands. Permanent barbed wire security fencing will only be installed along the perimeter of the Solar Sites for a maximum of 165,273.2 linear feet (~31.3 linear miles). The security fencing that will be installed is displayed on Figure 2-3 and the linear footage of this fencing is as listed in Table 2-3 below.

**Table 2-3
Maricopa Sun Solar Complex: Perimeter Security Fencing**

Solar Site Number	Linear Footage of Perimeter Fencing	Maximum Potential Linear Footage of Perimeter Fencing
Site 2-S	20,697.6	31,257.6
Site 3-S	19,324.5	19,324.5
Site 4-S	21,223.7	31,783.7
Site 5-S	26,441.7	39,641.7
Site 6-S	18,493.9	21,133.9
Site 7-S	28,400.1	31,040.1
Site 15-S	30,691.7	30,691.7
TOTAL	165,273.2	204,873.2



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LOCATIONS OF PERIMETER SECURITY FENCING INSTALLATION,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
2 - 3

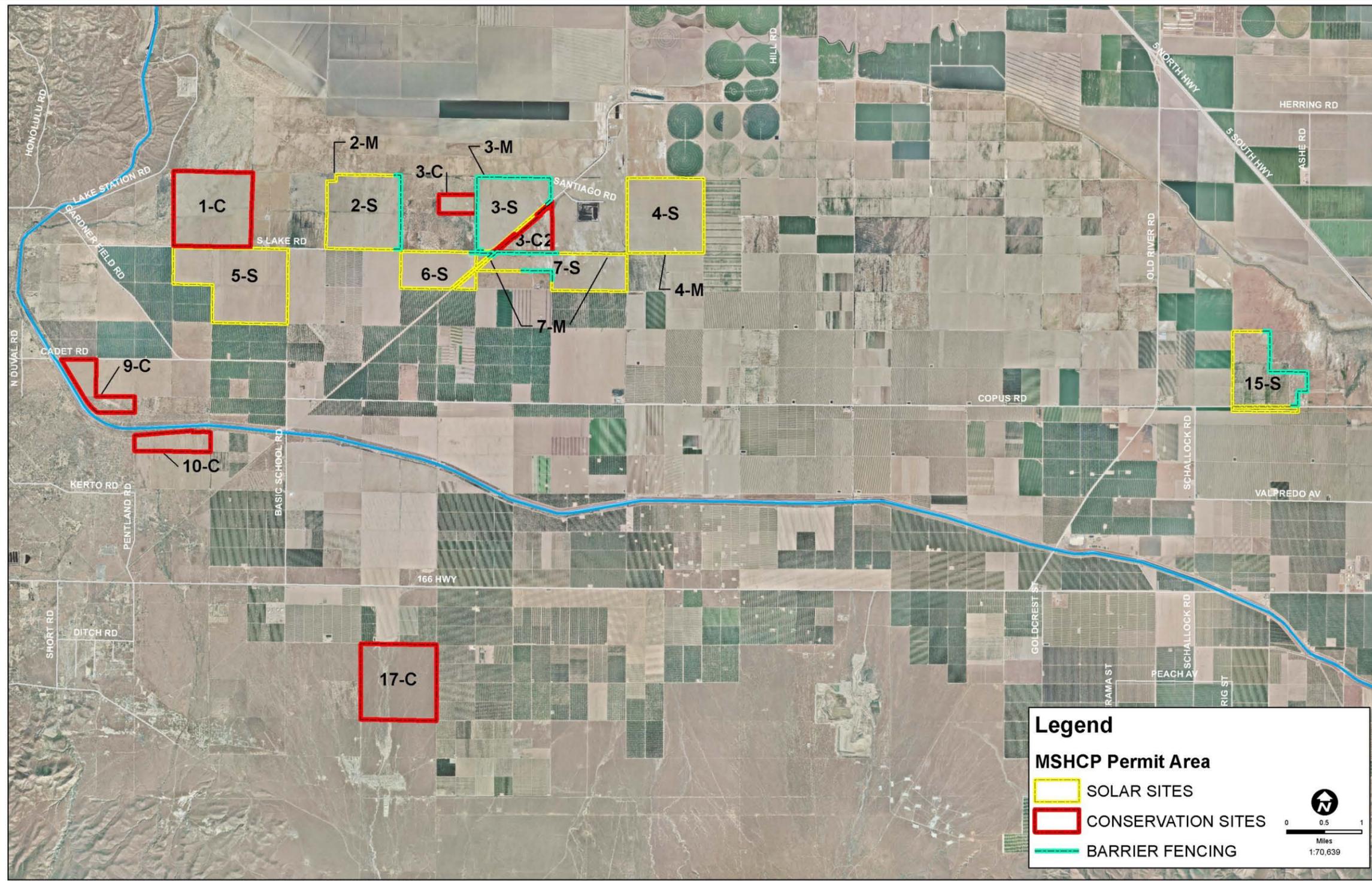
Security fencing will be designed to facilitate passage by San Joaquin kit foxes and other wildlife species and will include the following parameters:

- To enable kit foxes and other wildlife (e.g., American badger (*Taxidea taxus*) to pass through the project site after construction, the perimeter security fence shall leave a minimum 4- to 6-inch opening between the base of the fence and the ground surface. The bottom of mesh fencing materials or other materials having sharp edges shall be knuckled (wrapped back to form a smooth edge) to protect wildlife that passes under the fence. Where raised fencing cannot be installed, passageways having openings of 4 to 8 inches in diameter constructed of PVC pipe or other suitable materials shall be installed every 100 feet along the fence perimeter.
- Security fencing will be up to eight feet in height, including up to 2 feet of barbed wire across the top.
- The raised fence and/or the animal passageways shall be inspected and maintained to ensure proper functionality. If animal passageways are used, the perimeter security fence shall be inspected on a monthly basis throughout the project term, and all needed repairs shall be made within two weeks of the inspections. Where raised fencing is used, fencing shall be inspected every six months and all repairs shall be made within two weeks of the inspection. The results shall be included in the appropriate monthly and annual reports.
- Controlled access gates may be located at the project site entrances. Access to the secure areas may be controlled by keypad entry systems.

During construction, temporary impermeable fencing, also known as “barrier” fencing, will be installed between work areas and areas where Covered Species have been documented to occur to prevent species from becoming exposed to adverse effects from construction activities. Barrier fencing will be constructed of 36-inch-wide metal flashing buried six inches below grade. The barrier fencing will be supported on one side (on the construction side of the fence) by stakes, posts of reinforcing bar, or T-posts. The fencing will be affixed to the supports in a manner that will not allow Covered Species to climb the fence (i.e., bolts or fasteners must be a minimum of 18 inches apart). This barrier fencing will consist of a total of 38,442.5 linear feet (Table 2-4, Figure 2-4), but additional barrier fencing may be needed based upon the distribution of species at the time of construction, as determined during pre-activity surveys.

Table 2-4
MSHCP Complex: Barrier Fencing

Site Number	Linear Footage of Fencing
Site 2-S, 2-M	6,148.4
Site 3-S, 3-M	12,774.3
Site 7-S, 7-M	10,030.2
Site 15-S	9,489.6
TOTAL	38,442.5



LOCATIONS OF BARRIER FENCING INSTALLATION ON THE COVERED LANDS,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
2 - 4

Parking for construction workers, as well as staging and laydown areas for construction materials, will be prepared within the fenced Solar Development Footprints. It is anticipated that no more than 1 acre will be needed for parking on each site during the pre-construction phase, and that no more than 2 acres of temporary parking areas will be needed during the construction phase. The paved staging areas will be used for parking during later project phases.

Geotechnical Drilling and Testing

Each site will be tested for geotechnical conditions (soil strength and compaction) by performing field density tests or other acceptable methods. A track-mounted drilling rig and a support truck will be used to accomplish boring. Typical boring holes will be drilled to a depth of 15 to 25 feet (depending upon soil type and soil depths), and will be 2 to 6 inches in diameter. On average, one bore hole will be located within each 10 acres of the Solar Development Footprint. Based on this spacing, 370 drill holes will be drilled. The total area of disturbance caused by these drilling activities is estimated at 7.4 acres, based upon an average 30-foot-by-30-foot disturbance area for each boring.

Grading and Compacting of Roadways

Temporary and permanent roadways will be prepared using standard grading and compaction techniques. Grading of roads will be minimized by following existing topography. Heavy earth-moving equipment that will be used in grading and compaction may include: graders, scrapers, dozers, sheep's foot rollers, vibrating rollers, backhoes, excavators, and other equipment as necessary. Access to each site will be by means of an apron from adjoining surfaced road ways. The aprons will be constructed of a surface that reduces dust (e.g., gravel) or will be treated with a dust suppressant such as a lignin sulfate product. If operating on soils that cling to the wheels of vehicles, a grizzly or other such device will be used on the road exiting the site immediately prior to the pavement to remove most of the soil material from vehicle tires. Roadways may ultimately be graveled or paved to reduce the need for upkeep by repeated grading and compacting.

Installation of Signage

Appropriate equipment and tools will be utilized for placing signs. A variety of signs at a variety of locations will be needed, including caution or warning signs for high-output electrical systems, vehicle speed limit signs, stop signs, yield signs, "no trespassing" signs, traffic directing signs, ESA designating signs, and other similar signs. Signs will be affixed to fences whenever possible, but some free-standing signs will be needed. Most signage will be within the existing 3,700.5-acre Solar Development Footprint, thus causing no additional ground disturbance. However, some signs will be placed at entrances to access roads and other locations outside of and within the Solar Sites, and not within existing disturbance areas. These additional free-standing signs will cause an additional disturbance area beyond the solar footprint of estimated to be 0.1 acre.

Managing Waste

Non-hazardous waste generated from the project, including paper/plastic, cardboard, wire, wooden spools, pallets, and other waste and packaging materials will be removed regularly from the Solar Sites. All food-related trash items, such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a week from the Project site. All waste will be transported to the Taft Recycling and Sanitary Landfill, which is located at 13351 Elk Hills Road (approximately 15 miles from the Project site).

Hazardous materials may be used during activities that occur on site. Hazardous materials may include, but may not be limited to fuels, oils, lubricants, hydraulic fluids and solvents. The materials will be stored properly and Material Safety Data Sheets (MSDS) will be available on site. Hazardous materials and waste will be managed in accordance with federal, state and local regulations.

Testing, Plugging, and Abandoning Wells

There are three known previously plugged and abandoned oil wells located on the Solar Sites. The three oil wells are all located on Site 5-S and are shown on Figure 2-5, “Location of Oil Wells to be Abandoned.” The associated API well numbers for these abandoned oil wells are: 02936401, 02935290, and 03011933.

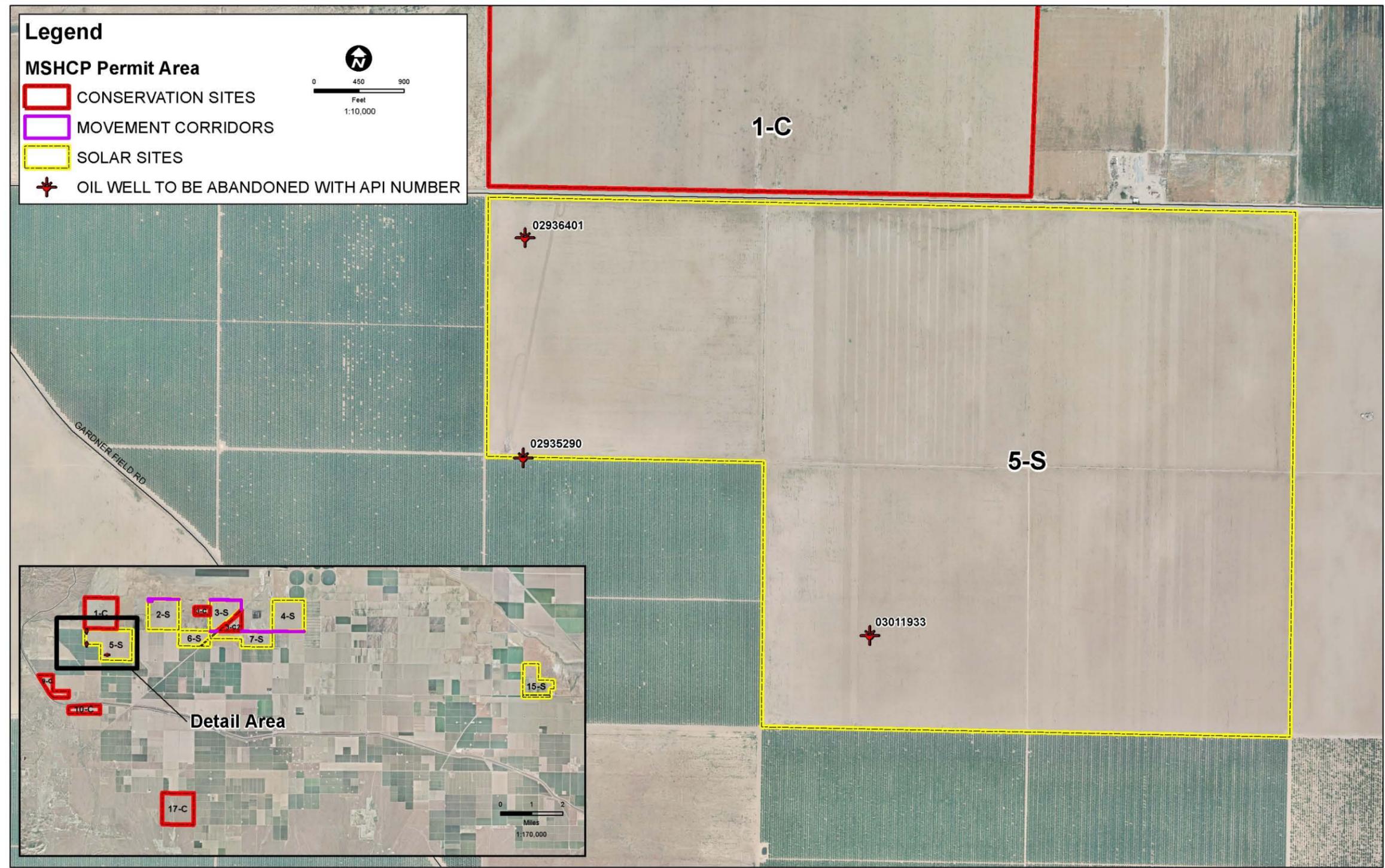
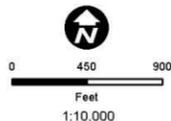
The following activities shall be performed on each of the three wells:

- The wells shall be leak-tested, which will require “pothole” excavation around each well casing, which will be accomplished with a back-hoe. An excavation of up to 20 to 30 feet in diameter and 10 to 20 feet deep may be necessary to access the steel plate across the casing that is usually located about 10 feet below grade. After the steel plate and casing are exposed, the plate will be removed. Depending on the condition of the cement in the well bore and annulus, a fresh cut to remove a small section of the casing may be required. Leak testing will then be conducted across the cement plug. Should the well pass the leak testing, no further action is required other than back-filling the excavation; and
- Should the leak test fail, remedial action will be required as directed by the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) engineers. Typically, this requires the use of a drill rig to bore out the previous cement plugs and then reseat the well bore and annulus as required. This operation requires the associated oil well drilling equipment and supplies, just as a normal well drilling operation does. A well pad of up to 1.5 to 2 acres will be required to support the re-abandonment drilling operation, which could take from several days to several weeks depending on the complexity. Thus a total disturbance area of 6.0 acres is assumed (3 wells, each with a 2 acre disturbance area).

Legend

MSHCP Permit Area

- CONSERVATION SITES
- MOVEMENT CORRIDORS
- SOLAR SITES
- + OIL WELL TO BE ABANDONED WITH API NUMBER



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LOCATIONS OF OIL WELLS TO BE ABANDONED ON THE PERMIT AREAS,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
2 - 5

2.3.2 CONSTRUCTION ACTIVITIES

Construction of the Project will occur in a series of solar array blocks, each averaging approximately 8.64 acres. For this MSHCP, each block is assumed to be capable of producing roughly 1 MW of electricity (depending upon technology). However, because some land area will contain other project-related facilities, such as operations and maintenance buildings, meteorological stations, and staging areas, an average of 1 MW per 8.64 acres of total Solar Development Footprint may not be obtained.

An estimate of 12 large, heavy-haul truck trips will be needed over the course of construction for each 8.64-acre solar array block, resulting in approximately 5,134 truck trips over the course of constructing the 3,700.5 acres of Solar Development Footprint (3,700.5 acres/8.64 acres *12 trips \approx 5,134 trips).

In addition to truck trips, solar development will generate employee vehicle trips to and from the work sites in the morning and evening. Employees will be arriving from the surrounding cities of Bakersfield, Taft, and Maricopa and are projected to utilize ridesharing at an average rate of 2 occupants per vehicle. At an estimated rate of 200 construction and support employees per one square mile section (640 acres) of solar development, approximately 100 employee vehicle trips will occur twice daily (a.m. and p.m.) for a total of 200 vehicle trips per day per 640 acres of Solar Site development (pers. comm. SunPower Corporation). If all Solar Sites of the Maricopa Sun Solar Complex are under development at once, a maximum of 1,400 employee vehicle trips per day could occur (seven Solar Sites at 200 trips per day per Solar Site = 1400 trips per day). It is anticipated that multiple Solar Sites will be undergoing construction activities at any given time, and that it will take from 12 to 18 months to complete construction on any given site.

Temporary construction facilities will be located within staging areas. The staging areas described in this MSHCP represent a maximum possibility depending on construction activity needs. Actual staging areas may be considerably smaller. Construction materials will consist of concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables. Concrete pads for solar panel drive motors may be installed, and electrical equipment will be set in trenches for the solar arrays.

A temporary concrete batch may be located within each Solar Site, on the staging areas, for mixing of aggregate and cement to create concrete. Concrete used in the foundations of solar panels will be batched within an hour after mixing is complete. Multiple temporary concrete batch plants will be used simultaneously during construction to reduce travel time between the locations of the concrete mixers and the foundations. The maximum area needed for concrete batch plants will not exceed 10 acres. Concrete batch plants may not be needed on each site, but are included in this discussion to establish maximum impact levels.

Various equipment will be utilized for the Project, including excavators, graders, lightweight trucks, dump trucks, flatbed trucks, support pick-up trucks, water trucks, concrete trucks, forklifts, end loaders, cranes, truck-mounted pole-hole auger, line truck with air compressor, scrapers, motor graders, backhoe/loaders, truck-mounted cranes, dozers, grade-all, pad drum

vibratory roller, conductor reel and pole trailers, bucket trucks, truck-mounted tensioner, and puller and trenchers.

The following descriptions of activities comprise the Covered Activities that will be implemented during the construction phase. Many of the activities occurring during the pre-construction phase will be continued during the construction phase. To reduce redundancy, those activities are not duplicated here, or if they are duplicated, the descriptions and activities differ between phases.

Construction of Operations and Maintenance Buildings, and Metering Stations

The Solar Sites will include a single operations and maintenance building adjacent to the solar fields. The building will include sufficient on-site parking as required in Section 19.82 of the Kern County Zoning Ordinance, and possible storage and equipment warehouse areas. The operations and maintenance buildings may also contain offices, storage space, bathrooms, and break areas. The total size of each operations and maintenance building will not exceed 1,800 square feet.

Septic systems will be installed to accommodate sanitary needs as required by the County Environmental Health Services Department. A backhoe will be used for septic tank and leach field installation. The Solar Sites will be designed for low water usage. Accordingly, septic tank capacity is assumed to not exceed 1,200 gallons with the leach field length not exceed 300 feet. One such septic system will be installed on each Solar Site. It is also assumed that vegetation will result from water released through leach fields.

A maximum of two meteorological monitoring stations, constructed on concrete pads, not to exceed 400 square feet in area (each), will be constructed on each project site to track insolation, temperature, wind direction, and speed. Construction materials and equipment, as well as trucks to facilitate construction, will be necessary. Trenching may be necessary for the installation of electrical conduits for the meteorological stations.

The ground disturbance created by installation of the operations and maintenance buildings, septic systems, meteorological stations, and related facilities will not exceed an estimated 35 acres. These disturbances will occur within the 3,700.5-acre Solar Development Footprint. The description above is included here to establish maximum impact levels. Actual impacts could be less than described here; for example, operations and maintenance buildings may not be permanent structures, but instead may be construction trailers that will not require leach fields, operations and maintenance buildings may not be needed on all Solar Sites, and meteorological stations may not be placed on concrete pads.

Construction of Solar Arrays, Modules, and Electrical Assembly

The solar fields will be constructed of either crystalline silicon or thin film PV (including concentrated PV) technology on tilted or horizontal single-axis trackers or fixed tilt supports. If tilted trackers are used, the PV modules will be mounted south-facing and tilted about 15 to 25 degrees from horizontal. Tilted tracker units will be arranged in east/west-oriented rows and be

self-tracking or connected by drive shafts to drive motors that rotate the solar panels from east to west to follow the sun throughout the day.

If tilted tracker units are used, the units will be mounted on precast or cast-in-place concrete ballasts, embedded foundations (i.e., piles, driven piers, or screw-type foundations), or other suitable structures to support the trackers. The foundations will be located at the foot of each tracker unit. The ballast foundations will be approximately 10 feet long by 2 feet wide and 1.5 feet high. The embedded foundations will be approximately 4.5 inches to 12 inches in diameter and up to 15 feet deep. The concrete electrical equipment pads that support the inverters and other electrical equipment will be approximately 15 feet by 60 feet; however, these dimensions will vary depending upon the number of inverters and other equipment per pad. The electrical equipment enclosures will be approximately 12 feet high. The highest point on the tilted tracker units (the uppermost solar panel) will be approximately 22 feet above the ground surface. The description above is included here to establish maximum impact levels; concrete pads may not be needed.

If horizontal trackers are used, they will be mounted horizontally (not tilted to the south), and arranged in north/south rows. These tracking units will be powered by a drive motor to track the east/west path of the sun on a single axis throughout the day. This tracking technology will generate about 30 percent more energy than a traditional fixed-tilt system. Concrete ballasts, embedded foundations, or other suitable structures will be used to support the trackers. The highest point for a horizontal tracker occurs during the morning and evening hours and is approximately 8 feet above the ground surface. The vertical support legs at each end of the trackers are driven into the ground; no concrete footing is required.

If used, the drive motors will be located approximately every 1,200 feet along each east/west row. The motors would be mounted on concrete foundations, approximately 8 feet by 12 feet in area and approximately 2 feet thick. The description above is included here to establish maximum impact levels; drive motors may not be placed on concrete pads.

If fixed-tilt panels are used, they will be constructed in east/west rows, and have foundations similar to those used for horizontal trackers. The fixed-tilt panels will be positioned to receive optimal solar energy, but the panels will not track the path of the sun. Fixed-tilt panels are approximately 6 feet off the ground at the highest point.

The wiring from the solar panels will deliver DC power along an underground trench or aboveground conduit to the inverters located on the electrical equipment pads. The inverters will convert the DC power to AC, which will then be stepped up to medium voltage via medium voltage transformer(s). The medium voltage transformers will deliver power along an underground or overhead collection system to the Project switchyard on Solar Site 2-S, and the power will be stepped up for interconnection to the electrical grid at the electrical transmission corridors.

Electrical wiring will run from the end of each row of panels to each combiner box (used to collect power from each string of solar panels), as well as from inverters to each tracker

motor. These wires range in size from 6 to 12 gauge, and will always be placed in conduits to prevent the possibility of electrocution to wildlife that may come in contact with wires.

Larger gauge cables, which run from combiner boxes to inverters (also known as, “home runs”), will only be placed in conduit where they enter or exit the ground. These vertical conduits generally run underground to about 2 feet below grade. At that point, cables will be directly buried up to approximately 2 to 3 feet below grade and will not be placed in conduit. Cables directly buried are wrapped in a PVC jacket, between 3 and 4 inches thick, which will avoid the possibility of burrowing wildlife species coming in contact with a cable and becoming electrocuted.

Delivery of Materials and Equipment

See description in Section 2.3.1, “Pre-construction Activities.”

Drainage, Erosion, and Dust Control

See description in Section 2.3.1, “Pre-construction Activities.”

Establishing and Maintaining Staging Areas

See description in Section 2.3.1, “Pre-construction Activities.”

The staging areas, consisting of up to a maximum of 35 acres of paved ground, and 6.3 acres of associated access roads will be installed during the pre-construction phase. The staging areas will be used throughout the construction phase and maintained as needed. Maintenance may consist of re-paving cracked and broken pavement, replacing damaged fences, continued dust control on access roads (including re-gravelling), and other related activities. These activities will be confined to the staging areas plus the graveled or compacted access roadways.

Installation of Fencing, Gates, Lighting, and Parking Areas

See description in Section 2.3.1 for pre-construction aspects of these Covered Activities.

These activities will begin during pre-construction and continue during construction. Security fencing may be installed during the construction phase along boundaries between individual solar developers’ solar facilities within the Solar Development Footprints, depending on the preference of each solar developer. If security fencing between solar developers arrays is installed, a total area of approximately nine acres (39,600 linear feet of internal fencing * 10-foot-wide fence removal disturbance area = 396,000 square feet or ~9 acres) will be affected entirely within the Solar Development Footprint.

Under approved conditions, such as during the use of hand-operated power tools, ancillary lighting will be used to adequately illuminate construction operations during periods of darkness. These light sources will be sited and designed so that light only illuminates intended equipment areas, and will be shielded so that lighting does not spill over onto adjacent areas. Maximum lighting will consist of vehicle-mounted lights used during agency-approved night construction

operations, vehicle-activated lights at each main gate, and lighting activated by motion detectors located at the operations and maintenance buildings and/or switchyards. It is anticipated that less lighting than described above will be required, but this description establishes a maximum values for the purpose of establishing maximum project impacts. The illumination value of project lighting will comply with the “Dark Skies Ordinance,” Section 19.81 of the Kern County Zoning Ordinance. All installed outdoor lighting will meet safety and security standards. Routine maintenance of lighting may include replacement of bulbs, wiring, and fixtures.

Grading and Compacting

The site access roads, inverter areas, and other plant areas will be prepared using standard grading and compaction techniques. Grading of roads will be minimized to the greatest extent possible. The Solar Sites will be graded to direct potential flood waters into channels adjacent to the existing and proposed right of ways, without increasing the water surface elevations more than one foot (Kern County Municipal Code, Section 17.48: Floodplain Management Code). Earth-moving equipment will be utilized. Site leveling of the Solar Development Footprint will be accomplished by disking the site with agricultural equipment and then rolling the site to provide a level surface for the safe installation of the solar equipment by construction personnel. A water truck will be utilized for on-site dust control on dirt roads and assisting in soil compaction throughout the duration of build-out of each parcel. In high traffic areas, dust may be controlled using lignin sulfate or other chemical dust suppressant. These activities will result in disturbance to 3,700.5 acres.

Reconductoring and Installation of Overhead Transmission Line Systems

Construction and upgrade of structures for AC collection and distribution systems will include layout, drilling, installing, and backfilling foundations, as well as activities associated with stringing of new transmission lines (Figure 2-6). Trucks, cranes, drills, and other heavy line equipment will be utilized to install the new structures, and lines may be installed by low-flying helicopter. Transmission Line system activities will be conducted either by Pacific Gas & Electric (PG&E) or by a private subcontractor (under contract to the Developer). Certain transmission activities occurring outside of the Solar Sites will be covered under a separate HCP held by Pacific Gas & Electric (Jones & Stokes 2006) as discussed below.

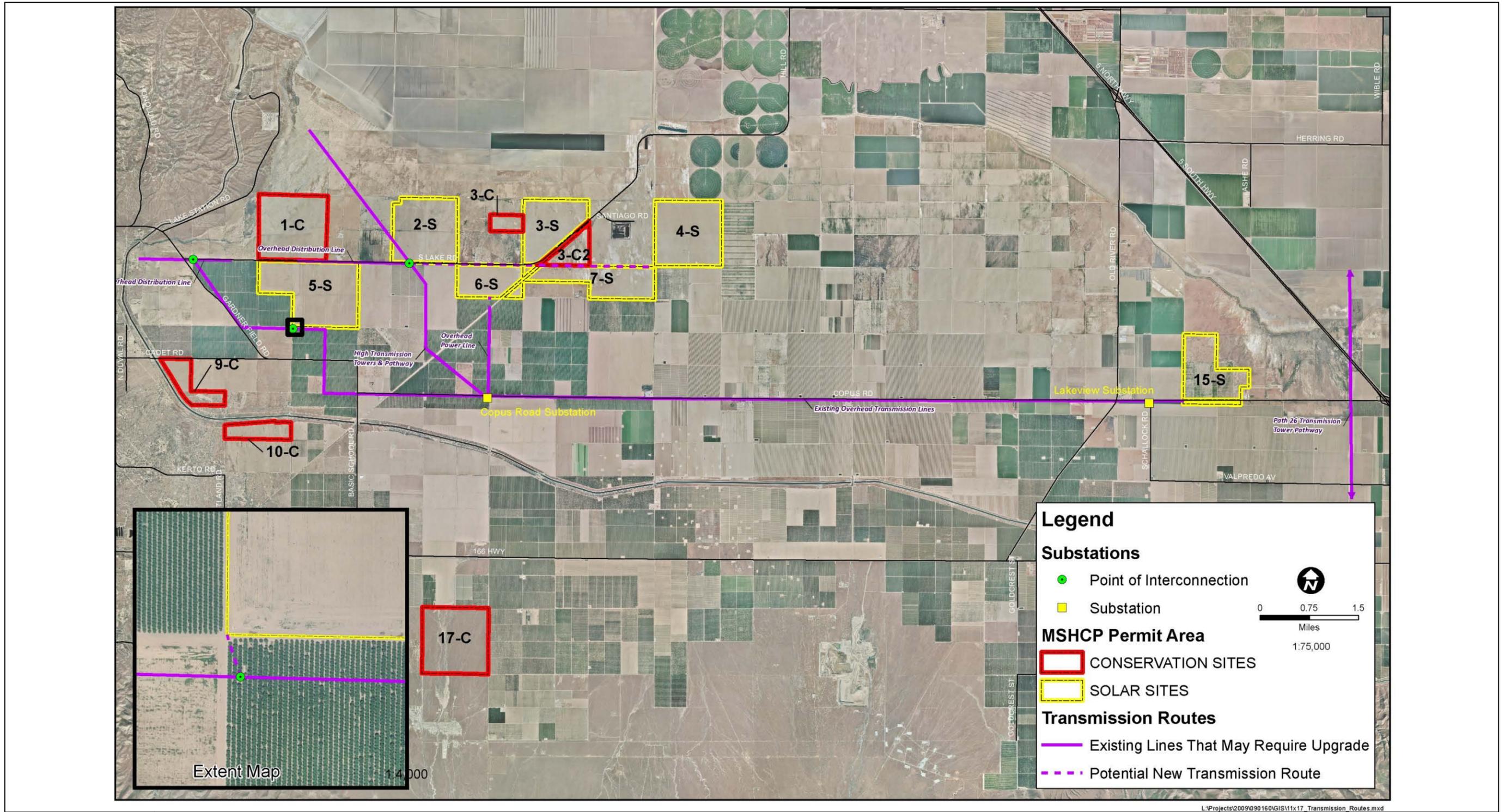
In addition to on-site substations, the following transmission related activities will be conducted by a private subcontractor under contract to the Developer and will be Covered Activities under the MSHCP:

- A short segment of new transmission line (gen-tie line) will be installed to connect Site 5-S to the existing 69kV Maricopa-Copus transmission line. Site 5-S will be connected to the existing transmission line just south of Site 5-S via an approximately 700 foot-long gen-tie line (Figure 2-6). A maximum of two new wooden pole installations and one replacement of a wooden pole at the point of interconnection (POI) with a tubular steel pole (TSP) will be required to accommodate the new gen-tie line. All pole replacements will occur within the PG&E ROW easement on lands owned by Maricopa Orchard, LLC. The ground disturbance associated with the installation of each new pole and the replaced pole would be a maximum of a 50-foot radius, for a total of 23,550 square feet or, 0.54 acres. One of the new poles

would be placed within the project site, which consists of disked lands. All other poles would be placed within an existing orchard, and the installation of these poles may require some orchard trees to be removed.

The following transmission related activities will be conducted by PG&E and will be Covered Activities under the PG&E HCP (Jones & Stokes 2006):

- Up to 10 wooden poles may need to be replaced along the existing Maricopa-Copus 69kV transmission line. Five of those poles would be located to the east of the POI, and five would be located to the west of the POI. The area of disturbance associated with those pole replacements would be a maximum radius of 50 feet around each pole, totaling 78,537 square feet or 1.8 acres. The five poles to the east of the POI are located within an existing orchard (with a 0.9 acre potential disturbance area) and some orchard trees may need to be removed



TRANSMISSION ROUTES, MARICOPA SOLAR SUN COMPLEX,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
2 - 6

to allow adequate work space for the pole replacements. The five poles to the west of the POI would be located within disked lands (with a 0.9 acre potential disturbance area).

- Utility upgrades associated with the development of a 400-acre solar development on Site 15 include: installation of 20 TSPs along Copus Road between the project site and the Lakeview substation or the installation of lattice steel towers (LSTs) as an alternate to the TSPs, pulling and tensioning at each TSP or LST location, potential underground installation of communications cable along the gen-tie route between the project site and Lakeview substation, expansion of the Lakeview substation, expansion of the Copus substation, and installation of telecommunications and related equipment at the Old River substation and Wheeler Ridge substations.
- Up to 20 TSPs or LSTs with 20-foot by 20-foot cement bases would be installed along 2,700 feet of Copus Road between the project site and the Lakeview substation. The towers would be placed on either the north or south side of Copus Road. Work areas would be confined to a maximum area of 50-foot radius around each tower, resulting in a maximum total disturbance area of 157,075 square feet or 3.6 acres. An additional 157,075 square feet, or 3.6 acres, is assumed to be needed for the pulling and tensioning sites.
- Communications cables may be installed underground between the project site and Lakeview substation. The cables would be installed along the 2,700 feet distance where TSPs or LSTs are installed. Underground installation of cables would require the excavation of a trench up to 4 feet deep and 2 feet wide, resulting in a disturbance area of approximately 10 feet wide by 2,700 feet long, or 0.62 acres. The trench would be installed either along the north side or south side of Copus Road, depending upon where the TSPs or LSTs are installed. Both the north and south sides of Copus Road between the project site and Lakeview substation are intensively cultivated agricultural lands. Alfalfa, asparagus, carrots, and other row crops are the primary agricultural crops along the north side of Copus Road, and grapes and alfalfa are the primary crops to the south of Copus Road. The land is cultivated up to the pavement edge of Copus Road on both sides of the road, but on the north side of the road there is sometimes a dirt road along the southern borders of fields with a narrow band of weedy vegetation between Copus Road and the dirt roads.
- Pacific Gas & Electric Company will also conduct various upgrades within their existing Copus, Maricopa, Midway, Lakeview, and Taft substations. These upgrades are generally related to communications and safety protocols required by PG&E. All upgrades will be conducted within the fenced footprints of these existing facilities and do not require the expansion of any substation. Because these upgrades will occur within existing fenced facilities that do not contain habitat that would support sensitive biological resources, significant impacts to biological resources will not occur.
- Upgrades to and expansion of the Lakeview substation may be required by the project. The footprint of the substation may need to be extended to the west by 300 feet and to the south by 200 feet, thus enlarging the substation by approximately 235,000 square feet, or approximately 5.4 acres. The removal and replacement of an existing control building, including concrete foundation, may be required. The installation of a 6 circuit breaker ring-

bus and upgrades of other equipment may be needed. Several entrances of existing lines into the substation will need to be reconfigured, resulting in the removal of up to five existing wooden poles and the installation of up to four new light duty steel poles and up to six new TSPs. The expansion areas of the Lakeview substation are completely within cultivated croplands consisting of grapes (to the south) and alfalfa (to the west). All pole replacements and new poles would be located within existing agricultural fields (alfalfa or asparagus) or along previously cleared dirt roads.

- Upgrades to and expansion of the Copus substation may be required by the project, which would include extending the substation footprint to the south by 100 feet and to the west by 150 feet, resulting in an enlargement of the existing footprint by approximately 72,500 square feet, or 1.7 acres. Fencing would need to be replaced, a small enclosure for telecommunications equipment may need to be installed, and a new control building may need to be located within the expanded footprint area. The expanded footprint and all associated upgrades would be located entirely within an existing citrus orchard.

Installing Signage

See description in Section 2.3.1, “Pre-construction Activities.” The installation of signage will be continued during the construction phase.

Landscaping/Site Enhancement

Drought-tolerant, native plants in pots that are a minimum size of 15 gallons will be planted along the security fence directly adjacent to local county roads to provide a visually appealing view from public roadways. Plants will be watered with drip irrigation or by water truck. The installation of landscaping will be performed within mandatory setback areas from existing public roadways and will result in impacts to an estimated 10.9 acres (20 foot-wide planting area * 4.5 miles of adjacent public roads = 10.9 acres).

Managing Waste

Hazardous and non-hazardous waste will be managed during the construction phase as described in Section 2.3.1, “Pre-construction Activities.”

Paving of Access Roads and Building Areas

With the exception of Site 4-S, each proposed Solar Site has existing paved road access from either South Lake Road (Sites 2-S, 3-S, 5-S, 6-S and 7-S) or Copus Road (Site 15-S). Paving of one access road to Site 4-S will occur. The access road to Site 4-S will encompass paving approximately 3,520 linear feet of roadway, measuring 20 feet wide. Paving of access driveways to each site will encompass paving driveway approaches 12 feet wide by 60 feet long, which will connect to the site’s parking lot, equipment areas, areas used for positioning of construction management crews, shipping and receiving areas, and/or storage and staging areas. The paving of access roads and access driveways will result in disturbance areas totaling approximately 1.7 acres (1.62-acre roadway to Site 4-S and 0.1 acres of paved driveways into the other six Solar

Sites). It is assumed that paved areas will consist of a 6-inch aggregate base with a 2-inch thick paved surface, resulting in an estimate of 1,822 cubic yards of materials.

Where paving is necessary, construction of paving may take up to two months to complete for each Solar Site, and will occur at the beginning of construction. Impervious surfaces within the Solar Sites will be limited to main access driveways, parking lots, equipment areas, shipping and receiving areas, storage and staging areas, and foundations for the Project's operations and maintenance buildings and inverters.

Post Construction Soil Treatment

After clearing, grading, earth moving, and/or excavating, and initial leveling has ceased, all inactive soil areas within the construction site will be either: (1) seeded using native plant species and watered until plant growth is evident; (2) treated with a dust palliative; or (3) watered twice daily until soil has sufficiently crusted to prevent fugitive dust emissions. After ground clearing activities are completed, avoidance area flagging and fencing will be placed where needed and removed in areas where construction is completed. Post-construction soil treatments will occur within the 3,700.5-acre Solar Development Footprint, and will not contribute additional disturbance acreage.

2.3.3 OPERATIONS AND MAINTENANCE ACTIVITIES

Solar equipment has a lifespan of up to 25 years, during which time operations and maintenance activities will be conducted. Operational activities are limited to monitoring facility performance, responding to utility needs for facility cleaning and adjustment, and on-site security.

Trucks (pick-up, flatbed), forklifts, and loaders may be used for routine and unscheduled maintenance, and water trucks will be used to wash solar panels and prevent excessive dust from vehicle traffic. Large, heavy-haul transport equipment will not be routinely needed, but may be used for specific equipment repair or replacement.

Long-term maintenance schedules will be developed to include periodic maintenance and equipment replacement in accordance with manufacturer recommendations. Moving parts, such as motors and tracking module drive equipment, motorized circuit breakers and disconnects, and inverter ventilation equipment, will be serviced on a regular basis, and unscheduled maintenance will be performed as necessary.

The primary water use during project operation will be for washing of the solar panels, with a minor amount of water use for watering landscape and for sanitary requirements. At times it may also be necessary to reduce dust emissions by spraying the ground with water from a water truck. It is presently expected that approximately 1 gallon will be required for washing each panel. The washing frequency may vary depending upon weather conditions, but it is estimated that the panels will be washed twice per year.

Fire protection measures will be dictated by Kern County Fire Department regulations. The operations and maintenance buildings will have fire retardant systems, and portable fire

extinguishers will be mounted outside inverter/electrical distribution containers or pads throughout the solar arrays. If required by the Fire Department, a 50,000-gallon process water tank (or larger as required to provide water for fire control) will be located on each project site.

The following list and descriptions of activities comprise the Covered Activities that will be implemented during the operations and maintenance phase. Some scheduled and unscheduled operations and maintenance activities will be conducted at night when it is possible to safely and cost efficiently power down the solar facilities. During the first year of operation of each individual solar facility, it is anticipated that up to six scheduled, on-site maintenance visits could occur. Maintenance activities for this first year include normal/expected startup issues and are not anticipated to involve any ground disturbing work. In all subsequent years of solar operation, up to four scheduled and eight unscheduled operations and maintenance visits to a solar facility are anticipated to occur. Maintenance activities will involve both scheduled preventative maintenance and unscheduled, unpredictable maintenance. The potential for minimal ground disturbance exists in the form of unearthing cabling for repairs and use of maintenance vehicles among solar arrays.

Many of the activities occurring during the operations and maintenance phase are similar to activities from the pre-construction phase. To avoid redundancy, recurring activities will not be described in detail here. Operations and maintenance activities having the potential to occur at night are noted below. These activities are not necessarily listed in the order in which they will be implemented.

Delivery of Materials and Equipment

This activity is described in Section 2.3.1, “Pre-construction Activities.” During the operations and maintenance phase, the delivery of materials and equipment will occur as much as six times per year and could occur day or night. Examples of delivery activities include, delivery of oil for transformers, delivery of materials for solar panel maintenance, delivery of materials for electrical wire repair or replacement, and, delivery of materials for other unforeseen maintenance and repairs.

Drainage, Erosion and Dust Control

These activities are described in Section 2.3.1, “Pre-construction Activities.” The maintenance of drainage and erosion features and dust control measures will be continued throughout the operations and maintenance phase of the project.

Maintaining Staging Areas

This activity is described in Section 2.3.1, “Pre-construction Activities.” Maintenance of staging areas may continue throughout the operations and maintenance phase of the project, or staging areas may be removed and replaced with solar arrays.

Fencing, Gates, and Parking Areas

These activities are described in Section 2.3.1, “Pre-construction Activities.” Maintenance of fencing, gates, and parking areas will be continued throughout the operations and maintenance phase of the project. These activities may include re-contouring parking surfaces, and repairs and maintenance of security fencing around parking areas, staging areas and operations and maintenance buildings.

Managing Waste

Hazardous and non-hazardous waste will be managed during the operations and maintenance phase. Very little activity is expected on any of the solar facilities during the operations and maintenance phase, so little waste material is expected to be generated. As with other phases of the Project, daily waste management will occur when workers are present on site and waste will be deposited in the appropriate closed containers. Hazardous waste will be removed from the solar facilities immediately after a spill or upon the finding of the waste, and non-hazardous waste will be removed at least once a week.

Meter Reading

Routine physical meter reading may be required to confirm automated readings. Meter reading will involve one vehicle driving on to the Solar Sites. Vehicle use for meter reading will be limited to the access roads and operations and maintenance structure sites (e.g., operations and maintenance building/trailer, substation).

Monitoring Alarms/Security

The Solar Sites may be fenced with an eight-foot high, galvanized chain link fence with barbed wire along perimeters to provide site security during construction and operational phases of the Project. The fence will include vehicle access gates that will remain locked when not in use. Security personnel will be on site to provide 24-hour security. Security personnel may use pick-up trucks or all-terrain vehicles to routinely traverse the site and inspect the site perimeter. Site security may also include the installation of closed circuit security cameras and motion activated lighting. Alarms and security fencing will be maintained as needed.

Operation and Maintenance of Solar Modules

Solar modules will operate 7 days a week, 365 days a year. The system may be solid state with no moving parts, or tracking arrays equipped with motors and other moving parts.

Operations and maintenance activities will be performed during day and night time hours depending on the need to power down the solar facility to perform the needed activity. Solar module operation activities will consist of responding to automated alarms based on monitored data (actual vs. expected tolerances for system output and other key performance metrics), communicating with customers, solar module washing, vegetation and weed management, security activities; and installation, maintenance, and operation of automated panel cleaning systems. Maintenance activities will include repairs to transformers, water/oil separator systems,

electrical equipment, panels and inverters, as well as roads and fences. Solar facility equipment will also need replacing and/or upgrading including, panels, inverters, transformers, wiring, cabling, power lines, mounting hardware, monitoring systems and panel cleaning systems as needed. Visual inspections of transformers, water/oil separator systems, PV panels, inverters, structures, cabling and wiring will also be performed and will not involve ground disturbance.

Solar Panel Cleaning

During the operations and maintenance phase, regular maintenance of the solar panels will involve cleaning and testing of proper function. Cleaning of the solar panels will involve the use of water trucks driving between solar panels throughout the Solar Development Footprint. It is anticipated that cleaning will be conducted by eight water trucks at a time, each of which can make eight trips per day to accomplish cleaning of all 4,411,902 solar panels over all Solar Sites (2 gal/solar panel/year for a total of 8,823,804 gals of water/year at 4,000 gal/truck capacity). Cleaning will be conducted at an estimated frequency of twice per year for a total of 128 truck trips per day for 35 days per year to accomplish cleaning of the entire Project.

Routine maintenance of the solar facilities will involve infrequent use of heavy equipment, including forklifts, heavy haul trucks and vegetation removal equipment. These maintenance activities will be conducted during day or night depending on the need to power down the solar facility of safety and cost efficiency. Night time maintenance activities will occur very infrequently (at most up to six times in the first year, and four times per year in subsequent years), but when they do occur they will present an increased risk to San Joaquin kit fox and Tipton kangaroo rats. Measures are in place to ensure potential impacts to Covered Species due to night activities are avoided or minimized to the extent possible (Section 2.3.5).

Vegetation and Weed Management

During the initial ground clearing and grubbing activities, existing weedy vegetation that develops in low amounts between disking events will be removed from the Solar Development Footprint areas. In scattered localities, low growing tamarisk is present and will need to be removed more aggressively by removing plants by the roots. Other invasive species will be chemical and mechanical means best suited for the species being controlled. Vegetation removal will occur throughout the Project, including on Conservation Sites during and beyond the 35-year permit period.

Residual water that is shed from the PV arrays during cleaning, or inadvertently applied beyond the limits of the PV arrays, will likely stimulate underlying vegetative growth. These areas that become routinely saturated are anticipated to support a relatively vigorous herbaceous layer. Vegetation and weed management will occur during the operations and maintenance phase to maintain access to PV arrays and keep PV panels from becoming obstructed by vegetation.

During the Project's operations and maintenance phase, the solar panels will be cleaned at an estimated frequency of twice a year, and maintained on an infrequent and unscheduled basis. This activity will necessitate having adequate access to the panels, which will be ensured by mowing or scraping access routes between the rows of panels. Because maintenance of access routes requires removal or disturbance of vegetation, they will be only wide enough to

accommodate a single maintenance vehicle. Limiting the installation and maintenance of access roads on the Solar Sites will allow vegetation under and around the solar panels, as well as outside the immediate Solar Development Footprint, to become established.

Vegetation removal could occur twice a year corresponding to the timing of PV array cleaning and to ensure that the arrays remain free of obstruction. If an usual growth of vegetation threatens to obscure solar panels, an additional round of vegetation removal may be required.

Vegetation and weed management on the Movement Corridors and Conservation Sites will be guided by the conservation program (Chapter 5) and the Habitat Management Plan (Appendix C).

2.3.4 DECOMMISSIONING ACTIVITIES

Solar equipment has a lifespan of up to 25 years. At the end of the Project operational term, the Project will be decommissioned and deconstructed. Prior to any decommissioning activities, surveys will be conducted to assess the extent to which Covered Species have occupied the Solar Development Footprint. All minimization, avoidance, and mitigation measures appropriate for presence of Covered Species, such as avoidance barriers, pre- and post-activity sweeps, and monitoring, will be implemented prior to and during decommissioning activities. Minimization, avoidance, and mitigation measures are discussed in Section 2.3.5.

Removal of the solar equipment will have little impact on the land. The PV arrays supporting solar equipment consist of foundation posts embedded in the ground or attached to -concrete ballasts and removal will involve the use of hydraulic cranes to directly uproot foundations without significant ground disturbance. Minimization measures will be implemented, further reducing potential for impact.

Upon completion of operations, the solar operator will be responsible for decommissioning. In the event the solar field is not in operational condition for a period of 12 consecutive months, it will be deemed abandoned and will be removed at the expense of the solar developer. Removal will occur within 60 days from the date that the Kern County Planning and Community Development Department sends a written notice to the property owner, solar field owner, and/or the solar operator.

The following list and descriptions of activities comprise the Covered Activities that will be undertaken during the decommissioning phase. Some of these activities are similar to those described in the pre-construction phase. To avoid redundancy they will not be described in detail here. These activities are not necessarily listed in the order in which they will be implemented.

Drainage, Erosion, and Dust Control

These activities are described in Section 2.3.1, “Pre-construction Activities.” Drainage and erosion control features will be left in place and will not be removed by decommissioning activities. Although most of these features will be composed of earthen berms, there will be some culverts and pipes that will be left abandoned and in-place. Keeping these features in-place

will aid in management of these lands as Conservation Sites by reducing and minimizing periods of flooding and erosion events. Dust control during decommissioning activities will be consistent with those activities and methods previously described.

Managing Waste

Hazardous and non-hazardous waste will be managed during the decommissioning phase as described in Section 2.3.1, “Pre-construction Activities.”

Removal of Access Roads and Fencing

All paved and graveled access roads, parking and staging areas, and access driveways will be removed. It is estimated that 1,822 cubic yards of materials will need to be removed from paved roadways, and 37,268 cubic yards of material will be removed from paved staging and parking areas. An additional 6,708 cubic yards of aggregate will be removed from graveled roads. All perimeter security fencing will be removed and replaced with permanent perimeter fencing constructed of 3- or 4-strand barbed wire or equivalent (e.g. hog fencing). Heavy equipment, large trucks, cranes, backhoes, and other large equipment, as well as various hand tools, will be used during removal of roads and security fencing, and installation of perimeter fencing. All materials removed will be recycled. It is assumed that a total of 4,580 truck trips will be required to remove this material.

Removal of Buildings, Foundations, and Concrete Pads

An operations and maintenance building will be installed on each of the seven Solar Sites. Each building will have a maximum size of 1,800 square feet. Removal of these buildings will be accomplished by use of a front-end loader and dump truck. It is estimated that a total of 600 cubic yards of material consisting of cement foundations, roofing materials, and wooden structural components will be removed from each Solar Site, totaling 4,200 cubic yards of material from all sites.

All leach fields and septic tanks will be left in place, as their removal would involve greater ground disturbance. Leaving this material in the ground will not constitute a significant increase of foreign material. All trenches or holes will be filled with soil from the project site.

Heavy equipment, large trucks, cranes, backhoes, and other large equipment, as well as various hand tools, will be used during removal of buildings. It is assumed that a total of 700 truck trips will be required for the removal of building materials. After demolition is complete, soils will be leveled using heavy machinery including disks, graders, and/or ring-rollers. Existing topography will not be changed during demolition activities or subsequent grading.

Removal of Electrical Cabling

All underground conduits housing electrical cabling will be left in place, but the conduits will be cut off below ground level, and all trenches or holes will be filled with soil from the project site. Electrical cabling contained within the conduits will be removed.

Removal of Solar Systems

Solar infrastructure removal will include the removal of rack systems, tracking systems and motors, PV panels, inverter/transformer and control room structures, electrical conduits and wiring, switch yards, inverter pads, and pads such as tracking motor pads. Concrete pads and foundations will be broken up into smaller pieces and hauled away from the project site for disposal.

Removal of infrastructure and facilities will be conducted in a manner that minimizes ground disturbance and dust, and disturbed soil from removal of support structures and trenches will be replaced. Heavy equipment, large trucks, cranes, backhoes, and other large equipment, as well as various hand tools, will be used during removal of solar facilities and related structures and equipment. It is assumed that a total of 5,140 truck trips will be required for the removal of the solar systems, electrical cabling, and solar related infrastructure. After demolition is complete, soils will be leveled using heavy machinery including disks, graders, and/or ring-rollers, but existing topography will not be changed.

Vegetation and Weed Management

During the decommissioning phase, all planted ornamental vegetation and irrigations systems will be removed. In areas where ground disturbance results from decommissioning activities, vegetation will be replanted using native species as described in the Conservation Sites Management Plan (Appendix C).

2.3.5 PRESERVATION, ENHANCEMENT, MINIMIZATION, AVOIDANCE, AND MITIGATION

Activities to preserve, manage, and enhance habitat, and to avoid and minimize impacts to Covered Species are Covered Activities. As such, they are incorporated into this MSHCP. Habitat management, enhancement, and monitoring activities will be conducted during all phases of the Project and will be conducted on Solar Sites and Conservation Sites as indicated within the descriptions below. Assurance of compliance with the MSHCP will be achieved through biological and Project monitoring carried out by a USFWS (and CDFW) approved, third-party biological monitor (Monitoring Agent).

On-site Habitat Preservation

Movement Corridors totaling 33.8 acres will be preserved. Currently, these Movement Corridors consist of disked lands that have little value for wildlife. Movement Corridors are intended to provide wildlife with a safe means for moving past the Project area. The Corridors provide habitat with escape cover and foraging that can be successfully used by wildlife, particularly the San Joaquin kit fox. By enhancing the habitat within the Movement Corridors, not only would movements of the San Joaquin kit fox be facilitated, but habitat would be provided to encourage use and dispersal by all other Covered Species (Tipton kangaroo rat, Nelson's antelope squirrel, western burrowing owl, and blunt-nosed leopard lizard) and other local wildlife.

Habitat Enhancements

Movement Corridors will be included in the conservation easements placed on the Solar Sites before construction begins. Management will follow the Habitat Management Plan (Appendix C), and will be for the benefit of Covered Species immediately upon recordation of the conservation easement.

Habitat enhancements will be provided within the Movement Corridors to facilitate their use by Covered Species. Enhancements will be installed during the construction phase, and will be monitored and maintained during the operations and maintenance phase. During the decommissioning phase, Movement Corridors and their enhancements will be protected from impacts that could result from decommissioning activities.

Habitat enhancements provided within the Movement Corridors are as follows:

Raised earthen berms will be created to provide refugia for small mammals during flooding events, and to provide burrowing, denning, and perching opportunities for a variety of species. San Joaquin kit fox dens, including escape dens and pupping dens, and burrowing owl perches will be installed. The raised earthen berms will be created along Movement Corridors. All berms will be created using topsoil from the project site. A general access dirt road may be maintained alongside a drainage ditch created at the base of the berm. The berms will be linear to facilitate construction by mechanical means, but they will not necessarily be continuous; gaps will be provided at strategic locations to allow flood waters to pass without causing undue damage to the berms.

- ***San Joaquin Kit Fox (*Vulpes macrotis mutica*) Dens***

Dens will be placed at a rate of eight per mile along Movement Corridors. One in ten dens will be designed as a natal den (or pupping den), while the remainder will be of the more simple refuge den design. Dens will be constructed following standardized configurations as detailed in Appendix D.

- ***Burrowing Owl (*Athene cunicularia*) Perches***

T-posts will be driven into the top of the earthen berms at a rate of eight per linear mile along Movement Corridors. A two-foot-long section of t-post will be welded at a right angle to the top of the main t-post to provide a suitable perching surface. Burrowing owls are expected to use artificial dens constructed for kit fox, so additional burrows specifically constructed for the burrowing owl will not improve the Movement Corridors for that species.

- ***Restoration of Vegetation Using Native Species***

There is sufficient evidence to conclude that lands along the Movement Corridors will not need to be restored; in periods between disking, many of the sites naturally revegetate with a variety of native species including alkali seepweed (*Sueada* sp.), saltbush (*Atriplex* sp.), cheeseweed (*Isocoma acradenia*), and various other native and non-native annuals. Initial revegetation is likely to consist of weedy and somewhat invasive species such as London rocket (*Sisymbrium ireo*) and five-hooked bassia (*Bassia hyssopifolia*), although over time these would diminish as

other species become established. The natural revegetation of these areas, even with weedy species, is anticipated to support native wildlife species, including the Covered Species. Nonetheless, there may be specific instances where seeding will be needed to re-establish a semblance of native habitat.

The desired vegetative cover is from 500 to 1,200 pounds of residual dry matter, consisting of a minimum of five native species per acre. All Movement Corridors will be evaluated annually for a period of three years. If, after three years, the species composition and vegetation cover is less than desired, as outlined in the Habitat Management Plan (Appendix C), a revegetation program will be developed and implemented at that time.

Long-term management of these lands through managed grazing and restoration, where needed, will be implemented as described in Chapter 5. Enhancements, management, and monitoring of the Conservation Sites will follow the Conservation Sites Management Plan (Appendix C).

Third-party Biological Consultant

Prior to the start of any Covered Activities, the qualifications of all third-party biological monitors (biological monitors) that will be involved with the Project will be submitted to the USFWS for their review and approval. The biological monitors will be given the authority to stop any work that may result in the take of listed species. The Project lead biological monitor will be the contact for any employee or contractor who may inadvertently kill or injure a Covered Species; or anyone who finds a dead, injured, or entrapped individual of a Covered Species. The Project lead biological monitor will possess a working cellular telephone whose number shall be provided to the USFWS. In the event of take of an individual (capture or kill) of a Covered Species, the Project lead biological monitor will contact the USFWS by phone within 24 hours of the incident and by written communication within 5 working-days of the incident.

Pre-activity Surveys

Pre-activity surveys are a requirement under this MSHCP to provide information used to minimize or avoid the impacts of solar facility development, operations and maintenance, and decommissioning on Covered Species. Pre-activity surveys will be conducted by biological monitors affiliated with a third-party biological consultant and approved by the USFWS prior to the start of any biological monitoring.

Pre-activity surveys will be conducted no more than 14 days prior to the inception of any project-related activity that involves on-site work (e.g., staking and surveying, compacting, grading, routine and/or unscheduled maintenance, decommissioning, etc.). In the event a break in work occurs for a period of 14 days or more, pre-activity surveys will need to be repeated before work may resume in that specific area. Portions of the Permit Area that are not scheduled for development will not require pre-activity surveys until such time as they are scheduled for development.

Biological monitors will conduct transect surveys with transects spaced 100 feet apart and with the assistance of binoculars to ensure 100 percent coverage of the Solar Site. Biological monitors will focus on detection of Covered Species or their sign, but will also note the presence of other

plant and wildlife species. If individuals or sign of Covered Species are detected, the biological monitor will document the observation with the following data:

- Species
- Type of observation (individual[s], sign, or other)
- Written location and GIS waypoint of observation
- General physical conditions of observation (e.g., size of burrow, condition of burrow, number of openings of burrow, etc.)
- Time of observation
- Date of observation
- Any ongoing work in the vicinity of the observation (in the event that the pre-activity survey is being performed due to a 14-day break in work)
- Photographs of the individual or sign, as possible

Appropriate measures, as outlined in this MSHCP (this Chapter and Chapter 6), will be implemented to ensure that project impacts are minimized or avoided to the extent possible. Such measures may involve establishing an Ecologically Sensitive Area (ESA) and associated buffers to separate Covered Species from project activities, restriction of high impact activities that generate significant ground vibration or noise at or above 120 dBA (A-weighted), and a reduction in speed limits in the vicinity of the ESA. The presence of the ESA will be reported and uploaded to the geo-database as described in Chapter 6.

Pre- and Post-activity Sweeps

Daily pre- and post-activity sweeps are a requirement under this MSHCP to provide information used to ensure project impacts to Covered Species are minimized or avoided to the extent possible. Sweeps will be performed by biological monitors immediately prior to commencement of daily work (pre-activity), and immediately after daily work has been completed (post-activity).

Pre-activity sweeps will involve a morning tailboard meeting with the construction foreman to inform the biological monitor of the location of planned work for the day. The biological monitor will then arrive at the work location to perform the pre-activity sweep no more than 30 minutes prior to work crews arriving. Pre-activity sweeps will be performed in daylight and biological monitors will plan for enough time to complete thorough sweeps before work crews arrive. A pre-activity sweep will involve a thorough inspection of the work site focusing on the following:

- Detecting any new sign of Covered Species (e.g., newly constructed burrows, dens or nest, scat, tracks)
- Detecting individuals of Covered Species
- Inspecting all staged materials and vehicles for the presence of Covered Species that may have taken up shelter in the material or vehicle overnight
- Verifying proper installation of BMPs according to SWPPP guidelines
- Identifying any ESAs already present in the area and ensuring that buffers are well demarcated
- Identifying any potential hazards to Covered Species that need to be addressed

Once a pre-activity sweep has been completed, information from the sweep will be documented in the daily report and the crew foreman will be notified of any findings and/or ESA(s) present in the work area. If any Covered Species or ESAs are present, the biological monitor will provide an on-site tailboard meeting to inform work crews of the species discovered/present, the need to delay or stop work in the event that the individual is present, and/or the ESA avoidance buffer(s) established in the area.

Post-activity sweeps will involve a detailed inspection of the work site as soon as possible upon completion of work. Post-activity sweeps will be performed before work crews leave for the day so that crews will be available to address any remedial actions necessary. Post-activity surveys will involve the following inspections of the work site:

- Presence of any trash items
- Presence of any vehicle or other equipment spills or discharge
- Verify correct installation of BMPs according to SWPPP requirements
- Proper upkeep of ESA buffers, if present

The biological monitor is responsible for ensuring that any and all issues discovered during the post-activity sweep are reported to the crew foreman, and that the issue is corrected before crews leave for the day. Findings of post-activity sweeps will be documented in daily reports.

Construction Monitoring

Daily construction monitoring is a requirement under this MSHCP to ensure project impacts to Covered Species are minimized or avoided to the extent possible. During all phases of the Project, a biological monitor will accompany work crews as they conduct work on site. Biological monitors will be responsible for assisting work crews in avoiding ESAs, and will watch for potential impacts to Covered Species during work activities. The biological monitor will have the authority under this MSHCP to stop work in the event that a Covered Species is detected in proximity of the work site or in the event that an ESA is, or is threatened with being encroached on. If work must be stopped, the construction supervisor and Project lead biologist will be notified to assess the severity of the situation. Work may continue once it has been determined that no take will occur by proceeding. Daily reporting for construction monitoring will be as outlined in Chapter 7.

General Minimization, Avoidance, and Mitigation Measures

All minimization and avoidance measures described under this MSHCP will be followed to ensure take of Covered Species is minimized, avoided, and mitigated to the extent possible. The following general minimization and avoidance measures (GM) will be implemented during all project activities to minimize potential incidental take of Covered Species:

GM-1: Where Covered Activities will occur, pre-activity surveys (see Pre-activity Surveys, this section) shall be conducted by authorized biological monitors (Monitoring Agent) no more than 14 days prior to the beginning of such activities. Immediately prior to project activities, additional pre-activity sweeps shall be conducted to ensure the work

sites are free of Covered Species. If discovered, Covered Species shall always be avoided to the extent possible. A biological monitor shall be on site at all times during project activities (discussed in Section 2.3.2) to ensure that impacts of Covered Activities on Covered Species are minimized or avoided to the extent possible.

- GM-2: An Employee Education Program (EEP) shall be developed and implemented in which individuals, including employees of contractors and subcontractors, who work on the project sites, are informed about the sensitive biological resources (including Covered Species) associated with the Project. This program shall be developed by a Monitoring Agent and shall consist of an on-site or training center presentation, including a slide show and written materials for each participant. The program shall discuss the locations and types of sensitive biological resources on and near the Solar Sites, Conservation Sites, and Movement Corridors; present an overview of the laws and regulations governing the protection of biological resources and the reasons for protecting these resources; discuss the various protection measures to be implemented; and identify official points of contact should questions or issues arise. Workers shall also be trained and directed to recognize Covered Species (live or dead), and they shall coordinate with Project biologists to assure accurate records of the locations of any Covered Species (live or dead) observed in the vicinity of the Permit Area.

Each participant shall be required to sign a statement declaring that the individual employee understands and shall abide by the guidelines set forth in the program materials. A list of all participants shall be maintained and provided to wildlife agency representatives upon request. The program shall be presented annually and as needed to ensure that all workers receive training prior to being allowed to work on the sites, and to ensure compliance with all protection measures. Separate trainings will be conducted for the construction, operations and maintenance, and decommissioning phases.

- GM-3: An SWPPP shall be prepared for all Solar Sites. The plan(s) shall include specific measures to be performed during construction periods that shall prevent discharge into sensitive biological resource areas, including wetlands, sensitive natural communities, and habitats occupied by Covered Species. Specific measures may include installation of hay bales, detention basins, or other means of intercepting excess runoff from the construction areas. Prior to final adoption, the SWPPPs shall be reviewed by the Project's Monitoring Agent to ensure that adequate measures are included. The SWPPP will not include lands or activities not covered in this MSHCP.
- GM-4: Project-related vehicles shall observe a 10-mph speed limit in all project areas, except on county roads and State and federal highways. Nighttime construction traffic shall be prohibited except under prior agency approval. Off-road traffic outside of designated driving areas shall be prohibited.
- GM-5: Covered Activities shall generally be restricted to daylight hours to avoid impacts to Covered Species. During the operations and maintenance phase it will be necessary for some activities to occur at night. Vehicle use during hours of darkness shall be limited to only those vehicles necessary to perform the given work or to conduct necessary

deliveries. Biological monitors shall be required to escort all personnel and their transport vehicles after dark. Speed limits shall be reduced to 5 miles per hour during all night time activities on the project site.

- GM-6: Due to noise susceptibility of Covered Species, noise levels at a distance of 300 feet from the edge of work areas shall be measured with noise meters. Noise measurements need only be taken in construction areas that are located within 300 feet or less of areas known to be occupied by Covered Species. Biological monitors shall be responsible for ensuring that crews are informed of Covered Species occupied areas and that noise measurements have been taken prior to the start of work activities.

Measured noise levels may not exceed 120 decibels on the A-weighted scale (dBA) for a period of more than one hour within any eight-hour period. Where noise exceeds these levels, construction personnel shall erect temporary noise barriers to reduce noise levels to 120 dBA or less. This measure shall be implemented during all phases of the Project.

- GM-7: All materials staged on the project site, and especially in staging areas, shall be spaced so as to not provide areas suitable for Covered Species 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.

- GM-8: Covered Species may be attracted to den-like structures such as pipes, culverts, pallets, wire bales, and construction equipment. All materials and equipment that are stored on a construction site shall be securely capped or covered to prevent use by Covered Species. Materials and equipment should be thoroughly inspected for Covered Species before being buried, capped, or otherwise used or moved in any way. If Covered Species are discovered within staged materials or equipment, all activity in the immediate area shall stop until the Covered Species has left the material or equipment, and the biological monitor has determined that it is safe to resume work.

- GM-9: Perimeter security fencing shall be designed to be permeable to Covered Species and shall be inspected throughout the life of the Project. The perimeter security fence shall leave a minimum 4 to 6 inch opening between the base of the fence and the ground surface. The bottom of the fencing materials or other materials having sharp edges shall be knuckled (wrapped back to form a smooth edge) to protect wildlife that passes under the fence. Raised fencing shall be inspected at six-month intervals and any repairs necessary to maintain the permeability of the fencing shall be made within two weeks of being reported. Where raised fencing cannot be installed, passageways having openings of 4 to 8 inches in diameter constructed of PVC pipe or other suitable materials shall be installed every 100 feet along the fence perimeter. Perimeter security fencing designed with wildlife pass-through channels shall be inspected once per month. All fencing maintenance/repairs shall be made within two weeks of being reported. Wildlife pass-through channels that are found to be blocked shall be cleared as soon as possible to prevent interference with permeability of the fencing. No Project

fencing shall be fitted with slats, which may entrap wildlife attempting to pass through it.

- GM-10: Temporary impermeable fencing or “barrier” fencing will be installed between work areas and areas where Covered Species have been documented to occur to prevent species from becoming exposed to adverse effects from Covered Activities. Occurrence of Covered Species will be documented during pre-project reconnaissance and protocol level surveys, pre-activity surveys, pre- and post-activity sweeps, and during on-going biological monitoring. Barrier fencing will be constructed of 36-inch-tall metal flashing buried six inches below grade. The barrier fencing will be supported on one side (on the construction side of the fence) by stakes, posts of reinforcing bar, or T-posts. The fencing will be affixed to the supports in a manner that will not allow Covered Species to climb the fence (e.g., bolts or fasteners must be a minimum of 18 inches apart).
- GM-11: All trash generated, including packaging materials from equipment and supplies, food-related trash items (such as used sandwich wrappers, cans, bottles, and food scraps), and un-used or discarded equipment and supplies, shall be disposed of in covered containers and removed from the Permit Area at least weekly.
- GM-12: Dogs and other pets shall not be allowed within the Permit Area.
- GM-13: No firearms shall be permitted in the Permit Area. Exceptions include those carried by agents of public law enforcement and security personnel.
- GM-14: Trapping and holding (or relocating) Covered Species, which will involve handling, could be required to avoid lethal take of Tipton kangaroo rats or Nelson's antelope squirrels during the operations and maintenance and decommissioning phases of the Project. Trapping shall only be conducted by a USFWS-approved biologist with appropriate trapping/handling permits. Blunt-nosed leopard lizards and San Joaquin kit fox shall be avoided entirely through implementation of avoidance measures outlined below. The trapping and relocation of Covered Species shall adhere to methodologies specified in the Relocation Plan for the Tipton kangaroo rat and Nelson’s antelope squirrel (Appendix F).
- GM-15: No plants or wildlife shall be taken (i.e., collected or removed), except as necessary for Covered Activities and then only by a biologist with the appropriate permit. Salvage of native species that are to be removed is encouraged, but shall only be performed by a biologist or other personnel trained to identify sensitive species and with the appropriate permit to remove those species. Relocation of wildlife shall only be performed by biologists approved by the USFWS, and under the guidance of the project lead biologist, under the conditions specified in this MSHCP and in the Relocation Plan for the Tipton kangaroo rat and Nelson’s antelope squirrel (Appendix F).
- GM-16: All trapping and relocations shall be conducted with prior approval of the USFWS, shall only be performed by USFWS-approved biologist with appropriate animal handling permits, and shall be followed up with a written report within five business days.

GM-17: Any incidence of take of individuals of Covered Species shall be reported to the USFWS by phone within 24 hours and in writing within five working days. Take of individuals includes capture (accidental entrapment and intentional trapping) and lethal take.

MINIMIZATION AND AVOIDANCE OF HABITAT DISTURBANCE

Solar Sites will be kept relatively clear of vegetation so that the sites are suitable for solar use. Management of vegetation within the Solar Development Footprints will include mowing and grazing on an as-needed basis to lessen the risk of fire and to facilitate solar operations. Vegetation and habitat within the Solar Development Footprints will not be managed specifically for the benefit of Covered Species, but it is anticipated that Covered Species may become established within some portions of some or all of the Solar Development Footprints over time, and while operations and maintenance activities are occurring. The Solar Development Footprints will be monitored to gauge the distribution and occurrence of Covered Species, and to ensure maximum avoidance of Covered Species during operations.

Within Movement Corridors and Conservation Sites, habitat will generally improve for Covered Species through the cessation of disking and management of vegetation density. As discussed further in Section 5.3, vegetation density should be managed to maintain a 20 percent or less cover of shrubs, and a cover of annual forbs and grasses that is between 500 and 1,200 pounds per acre of residual dry matter. In addition to providing habitat for Covered Species, preventing vegetation from becoming “dense” will reduce fire risks and the potential for vegetation to interfere with project operations. Mowing (and managed grazing if appropriate) will be used to maintain vegetation in a condition that optimizes its habitat value for Covered Species (as discussed further in Section 5.3) and is suitable for project operations. As discussed under Adaptive Management Strategy (Section 6.4), vegetation management may be adjusted in response to the results of biological monitoring.

SPECIES-SPECIFIC MINIMIZATION AND AVOIDANCE

The following avoidance and minimization measures will be implemented during Covered Activities to minimize potential incidental take of individual Covered Species:

Minimization and Avoidance Measures for San Joaquin Kit Fox

To protect the San Joaquin kit fox, standard protection measures (USFWS 2011) shall be implemented prior to and during all project activities. These protection measures will incidentally reduce the potential for project impacts to the American badger. Protection measures specific to the San Joaquin kit fox (SJKF-1 through SJKF-10) will be implemented during pre-construction, construction, operations and maintenance, and decommissioning:

SJKF-1: Pre-activity surveys shall be conducted no more than 14 days prior to the beginning of project activities, or any project activity likely to impact the San Joaquin kit fox. If any evidence of site occupation by Covered Species or other special-status species is

observed, an exclusion zone shall be established by an approved biological monitor. Exclusion zones shall be placed in accordance with USFWS recommendations at the following radii:

- Potential Den: 50 feet
- Known Den: 100 feet
- Natal/Pupping Den (Occupied and Unoccupied): Contact USFWS

If dens must be removed, they must be monitored for a minimum of three consecutive nights using cameras or tracking medium to determine kit fox use. If there is no kit fox activity for three consecutive nights, dens may be collapsed. If dens are actively being used by kit fox, no collapse of the den is permitted until all individuals have vacated the den. Destruction of natal dens and other “known” kit fox dens must not occur until authorized by USFWS. Once kit foxes have been confirmed to have vacated the den, and USFWS approval has been obtained, dens may subsequently be hand excavated by a trained wildlife biologist. Replacement dens must be constructed in suitable habitat outside of the construction area.

SJKF-2: 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 five feet deep shall be covered at the close of each working day by plywood or similar materials. Holes and trenches less than five 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 daily for trapped animals regardless of whether or not work is occurring in that area. Before holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the procedures described under SJKF-5 and SJKF-6, below, shall be followed.

SJKF-3: The Project Administrator shall appoint a representative to be the point of contact for any employee or contractor who might inadvertently kill or injure a kit fox, or who finds a dead, injured or entrapped individual. The point of contact’s name and telephone number shall be provided to the USFWS. If any kit fox is inadvertently injured or killed during construction or operations, all work shall be immediately stopped until the cause of injury is determined, and a plan to avoid any additional injury has been implemented in consultation with the project lead biologist and the USFWS.

SJKF-4: In the case of trapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape, or the USFWS shall be immediately contacted for advice.

SJKF-5: Any solar operator, or representative, contractor or subcontractor of a solar operator who inadvertently kills or injures a San Joaquin kit fox shall immediately report the incident to their point of contact. The point of contact shall contact the USFWS and

CDFW immediately in the case of a dead, injured or entrapped kit fox. The CDFW contact for immediate assistance is State Dispatch at (916) 445-0045. State Dispatch shall contact the local warden or biologist.

SJKF-6: The Sacramento Fish and Wildlife Office and CDFW shall be notified via phone within 24 hours and in writing within three working days of the accidental death or injury to a San Joaquin kit fox during Covered Activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal, and any other pertinent information.

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

SJKF-8: Upon completion of the project, all areas subject to temporary ground disturbances including, for example, storage and staging areas, temporary roads, and pipeline corridors, should be re-contoured, if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas will be determined on a site-specific basis in consultation with the USFWS, CDFW, and revegetation experts.

Minimization and Avoidance Measures for the Tipton Kangaroo Rat and Nelson's Antelope Squirrel

To ensure that incidental take of Tipton kangaroo rat and Nelson's antelope squirrel are avoided to the extent possible, the following minimization and avoidance measures (TNM-1 through TNM-4) shall be implemented prior to any pre-construction, construction, operation and maintenance, or decommissioning activities:

TNM-1: All areas of the project sites where there is a potential for Tipton kangaroo rat burrows and Nelson's antelope squirrel burrows to occur, as determined by a biological monitor, shall be inspected for the presence of burrows within 14 days prior to start of any project activity (see "Pre-activity Surveys," this Section). Occupancy by Tipton kangaroo rats and Nelson's antelope squirrel will be determined by trapping in the vicinity of observed burrows, or more conservatively, may be assumed based on the presence of burrows fitting the description for the species. Occupancy by Covered Species is determined by pre-project biological surveys, pre-activity surveys, pre-activity sweeps, and on-going biological monitoring. Biological monitors will coordinate with construction foremen during pre-activity sweeps to identify activities involving high levels of noise that will occur in close proximity to known locations of

Covered Species, and will ensure measurements are taken to monitor noise levels. Activities involving noise levels at or above 120 dBA will require the use of noise buffers or will be limited to less than one hour duration.

- TNM-2: Given current site conditions (Chapter 3), it is not anticipated that the Tipton kangaroo rat, Nelson's antelope squirrel, or other special-status species will occur on the Solar Sites during the pre-construction or construction phases of the Project. If they do become present, ESA buffers shall be established and biological monitors shall ensure that project activities avoid impacting the species. In the event that project activities must occur within areas that have become occupied by Tipton kangaroo rats or Nelson's antelope squirrels, the Relocation Plan (Appendix F) shall be implemented upon prior approval by the USFWS. The Relocation Plan shall be carried out by a permitted and USFWS-approved biologist and all results shall be provided to the USFWS in writing within five business days.
- TNM-3: Tipton kangaroo rats and Nelson's antelope squirrels will be temporarily housed when feasible, to avoid additional stress and disruption to other Tipton kangaroo rat populations through relocation. Temporary housing will be feasible if the duration of project activities resulting in the need for trapping does not exceed ten days. If temporarily housed, Tipton kangaroo rats and Nelson's antelope squirrels shall be held in ventilated containers of at least 12 inches long by 12 inches wide by 4 inches high. The containers shall be partially filled with substrate material and shall be kept in the shade or indoors where ambient temperature shall not exceed 95° Fahrenheit (F), or be allowed to drop lower than 68°F. Likewise, temperatures shall not exceed 95°F during transport. Appropriate food items shall be provided. If relocation becomes necessary, the animals shall be relocated in accordance with the Relocation Plan (Appendix F).
- TNM-4: During operations and maintenance and decommissioning, no small mammal burrows shall be removed without first being inspected by a qualified biological monitor. If removal is unavoidable, then trapping will occur at each burrow for a minimum of four nights. Trapping and potential relocation shall proceed as discussed above and outlined in Appendix F. Once the animals have been removed, all burrows shall be excavated by hand under the direct supervision of a qualified lead biologist and in compliance with USFWS requirements.

Minimization and Avoidance Measures for Burrowing Owls

To ensure protection of the western burrowing owl, the standard protection measures provided in CDFW] March 7, 2012 *Staff Report on Burrowing Owl Mitigation* shall be implemented (CDFG 2012). Under this MSHCP, buffer distances have been reduced from those recommended in CDFG 2012 to ensure protection of the western burrowing owl while limiting interference with the progression of development. Measures to protect western burrowing owls shall be implemented prior to any pre-construction, construction, operation and maintenance, or decommissioning activities. These measures (WEBO-1 and WEBO-2) are summarized as follows:

WEBO-1: Pre-activity surveys of the project area and a 500-foot perimeter of the project area shall be conducted no more than 14 days prior to the start of project activities. If more than 14 days lapse between the time of the pre-activity survey and the start of ground-disturbing activities, another pre-activity survey must be completed (see “Pre-activity Surveys,” this Section).

**Table 2-5
Recommended Restricted Activity Dates and
Standard Buffer Distances – Burrowing Owls**

Location	Time of Year	Level of Disturbance*		
		Low	Medium	High
Breeding burrow/nest	Feb 1-Aug 31	250 ft	500 ft	500 ft
Non-breeding burrow	Sept 1 – Jan 31	160 ft	250 ft	500 ft

* Levels of disturbance are defined as follows:

Low disturbance – Light vehicle (pick-up trucks or similar) traffic at intervals of 12 or fewer per day.

Medium disturbance – light vehicle traffic and construction work consisting of fewer than 10 workers using hand tools with noise levels greater than 95 dbA for a period of 1 hr. or more, measured 100 feet from work area.

High disturbance – Heavy equipment operations, greater than 10 workers per day, noise levels exceeding 95 dbA for over 1 hr in duration.

WEBO-2: If burrowing owls are present on the construction sites (or within 250 feet of the construction sites) during the breeding season (April 15 through July 15), and appear to be engaged in nesting behavior, a fenced ESA buffer shall be installed between the nest site or active burrow and any earth-moving activity or other potential disturbance according to the buffer recommendations presented in Table 2-5. This buffer may be removed once it is determined by the lead biologist that the young have fledged and are no longer dependent on the nest or burrow for survival. Typically, the young fledge by August 31. Actual fledging dates may be earlier or later, and shall be determined by the lead biologist. Standard buffer distances shall be maintained as recommended in CDFG 1995. These buffer distances may be reduced on a case-by-case basis and with the guidance of the lead biologist and prior approval by the USFWS. The standard buffer distances shall only be reduced to a size that retains “no disturbance” to burrowing owls.

Minimization and Avoidance Measures for Blunt-nosed Leopard Lizard

To ensure that there is no lethal take of a blunt-nosed leopard lizard, the following minimization and avoidance measures (BNLL-1 through BNLL-4) shall be implemented prior to any pre-construction, construction, operation and maintenance, or decommissioning activities:

BNLL-1: Barrier fencing shall be provided during all phases of construction between project activity sites and native habitat areas adjacent to those sites (see Figure 2-4). The fencing shall be buried a minimum of six inches below grade and extend a minimum of 36 inches above grade. This barrier fencing shall be constructed of metal flashing,

plastic sheeting, or other materials that cannot be climbed by blunt-nosed leopard lizards, and will be supported on one side (on the construction side of the fence) by stakes, posts of reinforcing bar, or T-posts. The fencing will be affixed to supports in a manner that will prohibit blunt-nosed leopard lizards from climbing the fence. (i.e., bolts or fasteners must be a minimum of 18 inches apart).

BNLL-2: The fencing shall be inspected by a qualified biological monitor on a weekly basis to ensure fence integrity. Any needed repairs to the fence shall be made on the day of their discovery. Fencing shall be installed and maintained during all phases of construction, but is only required when project activities occur within 200 feet of habitat suitable for supporting the blunt-nosed leopard lizard. Fencing may be removed once construction activities are complete.

BNLL-3: Annual surveys shall be conducted on all developed Solar Sites during the blunt-nosed leopard lizard adult activity period (April 14 to July 15) to identify areas inhabited by the species.

BNLL-4 In areas identified as occupied by blunt-nosed leopard lizards, Covered Activities will be restricted to the species active period to ensure that no blunt-nosed leopard lizards aestivating in burrows are crushed. Environmentally Sensitive Areas shall be established and signs shall be posted indicating increased sensitivity of the area. A biological monitor shall be required to accompany all work crews in the vicinity of ESAs. No ground disturbing activities shall occur within identified ESAs. Qualified biological monitors shall inspect ESAs during the adult and juvenile activity period to ensure that all blunt-nosed leopard lizard avoidance measures are being adhered to.

BNLL-5: All vehicular traffic occurring during construction and during operations and maintenance activities, and occurring on all dirt and graveled roads in areas identified as occupied by blunt-nosed leopard lizards shall be limited to 5 mph or less to reduce the potential for mortalities of blunt-nosed leopard lizards from vehicular strikes. Vehicles entering a blunt-nosed leopard lizard occupied area shall require accompaniment by a biological monitor.

2.3.6 MANAGEMENT ACTIVITIES ON CONSERVATION SITES

Continued and appropriate management of Conservation Sites will be conducted by third-party land managers. Conservation Sites will be held in perpetuity, and conservation easements will be recorded on designated lands. The management of Conservation Sites will be conducted by a qualified land management trust or by a qualified biological consulting firm approved by the USFWS. Management of the sites will include a wide variety of activities, including studies to determine the effectiveness of the MSHCP. These activities are described in detail in Chapter 5 and 8, and include required, optional, and possible actions that will be implemented within Conservation Sites.

Management of the Conservation Sites may include a range of the following activities: annual monitoring of Covered Species; studies associated with the Habitat Management Plan; reporting

of findings to agencies; and habitat enhancements to increase sustainability of Covered Species. Habitat management will include: appropriate fencing where no fencing exists, or repair of existing fencing to prohibit trespassing, unauthorized off-road vehicles, and trash dumping; trash removal and signage installation; vegetation improvements appropriate for Covered Species (for example, enhance saltbush, improve grasslands through managed grazing, utilize natural revegetation, etc.); limitation of road use and abandonment of roads no longer needed; and implementation of adaptive management actions in accordance with the Conservation Site Management Plan (Appendix C).

Annual monitoring of Covered Species and their habitat on the Conservation Sites will include the following types of survey activities: vegetation sampling; small mammal trapping; bird surveys; reptile surveys; track and camera stations; and spotlighting. As described further in Chapter 6, annual monitoring for both Covered Species and other special status species will be conducted.

The specific methodologies and frequencies of the conservation plan activities and management of Covered Activities that will occur within Conservation Sites are further discussed in Chapter 5.

2.4 *Activities/Lands Not Covered*

The MSHCP covers all lands and activities for which ITP coverage is needed over the permit term for pre-construction, construction, operations and maintenance, and decommissioning of the Project. Certain activities may occur in the Permit Area over the permit term that are not appropriate for coverage under this MSHCP due to a variety of factors including lack of information, speculative nature of the activities, and other future foreseeable or unforeseeable activities. The activities listed below are not covered under this MSHCP.

2.4.1 MINERAL DRILLING ACTIVITIES

Conditions of Project approval and mitigation measures for the Project allow for mineral rights interests to be served by reserving a maximum of 5 separate 10-acre drilling site areas per 640 acres, and allowing for routes of ingress and egress thereto. The locations of the drilling islands have not yet been identified. Activities associated with the exploration and/or development of potential future drilling sites for the purposes of oil and gas exploration and production by mineral rights owners will be subject to separate incidental take authorization and environmental review, and are not covered by this MSHCP.

2.4.2 UTILITY INSTALLATION, MAINTENANCE, AND REPLACEMENT

Public and private easements exist within the Permit Area. These easements contain existing roads, transmission lines, and pipelines. The installation of utilities unrelated to the Project, and the maintenance or replacement of those existing utilities will be subject to separate incidental take authorization and environmental review, and are not covered by this MSHCP.

2.5 Covered Persons/Entities

Persons covered under this MSHCP (Covered Persons) will be Maricopa Sun, LLC, which will be the project administrator for the Permit. Project Developers and their subcontractors, property owners, solar field owners and operators: and persons involved with Conservation Site management and their contractors, subcontractors, agents, successors, appointees, and representatives will be required to adopt and implement the terms and conditions of the Section 10(a)(1)(B) permit and associated MSHCP, including participation in educational programs and funding mechanisms established in support of the MSHCP, as a condition of sale, lease, or other involvement within the Permit Area.

3.0

ENVIRONMENTAL SETTING AND BIOLOGICAL RESOURCES

3.0 ENVIRONMENTAL SETTING AND BIOLOGICAL RESOURCES

3.1 *Introduction*

This section presents the environmental setting of the MSHCP Permit Area. It describes the baseline biological conditions that occur on the Solar Sites upon which the impact analysis and conservation program were formulated. This section also includes the environmental setting and biological conditions present on the Conservation Sites. A complete report documenting the surveys conducted on the Conservation Sites, the results of those surveys, and the justifications for adopting the Conservation Sites as appropriate mitigation for the loss of habitat associated with development of the project are presented in Appendix G. The setting is described in the context of the following subject areas:

- Geography;
- Topography;
- Climate;
- Land use;
- Soils;
- Hydrology;
- Jurisdictional wetlands and waters;
- Site characteristics; and
- Covered Species.

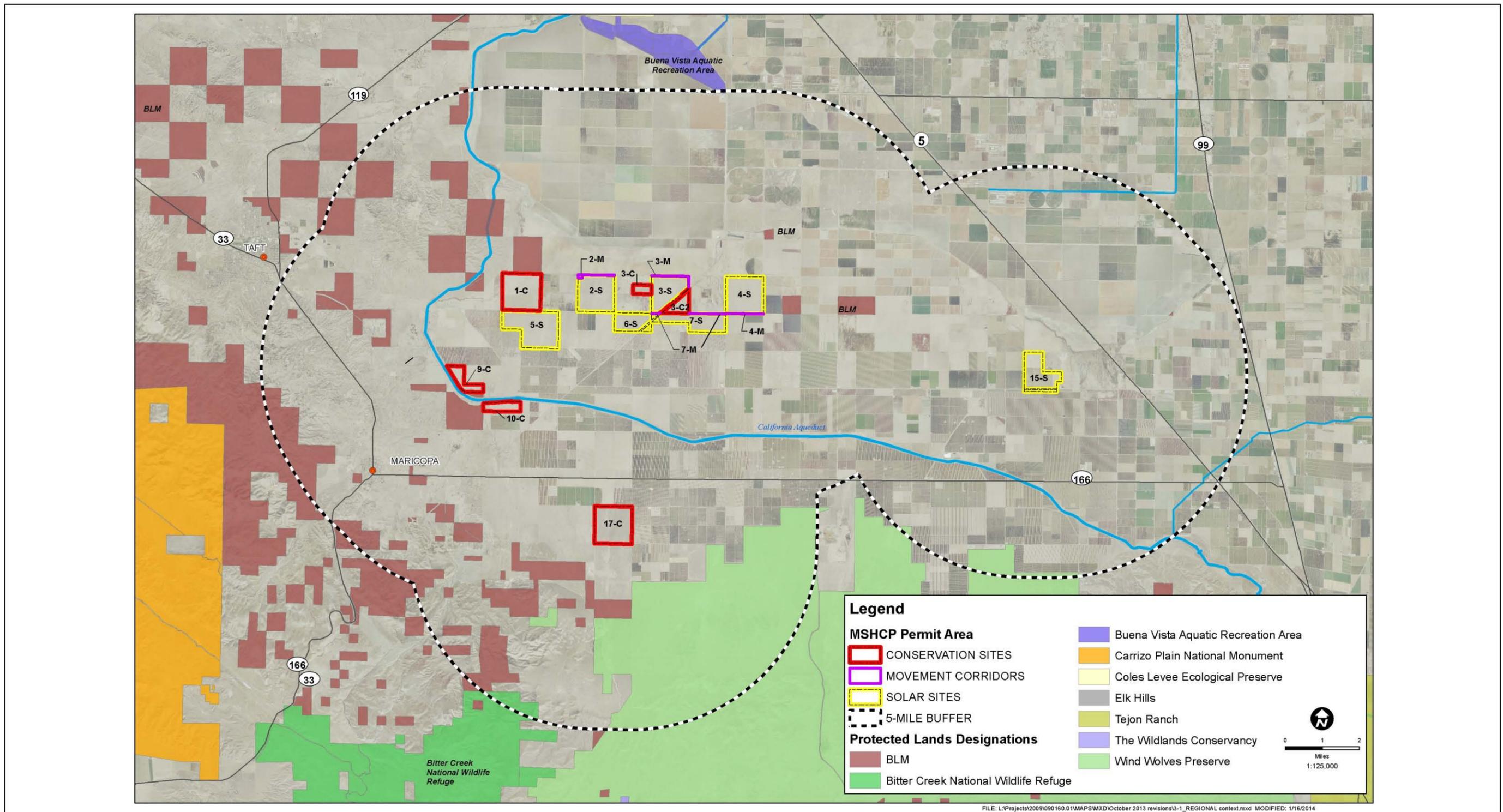
3.2 *Regional Setting*

3.2.1 GEOGRAPHY

The biological resources discussed in this section are those found within the Permit Area and on adjacent lands. The Permit Area is primarily located approximately five miles east of Taft, along South Lake Road and along Old River Road in Kern County, California (see Figure 1-2). Three of the Conservation Sites are contiguous with the Solar Sites, and three are located some distance away: one site is located one mile south of Hwy 166 and approximately 8 miles east of Maricopa (Site 17-C); and two are located approximately one mile southwest of the Solar Sites, bordering the north and south sides of the California Aqueduct (Sites 9-C and 10-C). All of the Conservation Sites are within 6 miles of the Solar Sites, except for Site S-15, which is located approximately 7 miles east of the other Solar Sites and approximately 11 miles northeast of the southernmost Conservation Site (Site 17-C) (Figure 3-1).

3.2.2 TOPOGRAPHY

The topography of the area is mainly flat, cultivated or fallow lands with the only substantial and evident relief provided by ditches, levees, canal berms, and berms along roadways. The project sites are north of the Transverse Range, near the southeastern base of the San Emigdio Mountains, generally to the south and southeast of the historic south shore of Buena Vista Lake.



REGIONAL CONTEXT AND LOCATIONS OF PROTECTED PUBLIC LANDS IN THE VICINITY OF THE PERMIT AREAS, MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure 3-1

Elevations on the Permit Area range from approximately 320 feet AMSL in the eastern end of the Permit Area to approximately 900 feet AMSL in the southern portion. Although the lands that comprise the Permit Area are repeatedly disked for weed control (except the 152.9 acres of Site 3-C2, an 83.25-acre portion of Site 9-C, and the 647.7 acres of Site 17-C), some low relief occurs because the sites have not been laser-leveled. Conservation Sites 17-C and portions of Site 9-C contain natural topography. Conservation Site 3-C2 has not been disked for a number of years for weed control, and retains some low topographic relief.

3.2.3 CLIMATE

The project area has a moderate climate with generally mild temperatures throughout the year. The weather is hot and dry in the summer, and cold and moist in the winter. The average temperature in the winter is 48.5 degrees Fahrenheit (°F) and the average daily minimum winter temperature is 38.3°F. Winter rains are interspersed with spells of cloudy, foggy, or sunny weather. The average summer temperature is 80.7°F and the average daily maximum summer temperature is 94.8°F. The annual average precipitation is 6.32 inches, with all of the precipitation falling as rain. The sun shines 93 percent of the time in the summer, and 73 percent of the time in the winter. The prevailing wind is from the west-northwest. Average wind speed is highest in April and May, at 7.7 miles per hour. Snowfall has not been recorded at Maricopa, and measurable snow is a rare occurrence in Bakersfield (USDA 2009). The growing season is over 350 days per year. Table 3-1 provides the monthly maximum, minimum and mean temperature and precipitation recorded for the Maricopa area.

Table 3-1
Monthly Maximum, Minimum, and Mean Temperature and Precipitation
(Maricopa climate station: <http://www.idcide.com/weather/ca/taft.htm>)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max °F	56.9	63.8	68.6	75.9	83.9	92.2	96.9	95.8	90.0	80.5	66.1	57.2	77.3
Min °F	38.6	42.9	45.7	49.4	56.6	63.9	69.8	68.7	64.7	56.6	45.3	38.0	53.4
Mean °F	47.8	53.4	57.2	62.7	70.3	78.1	83.4	82.3	77.4	68.6	55.7	47.6	65.4
Inches of precipitation	1.16	1.13	1.40	0.51	0.21	0.04	0.00	0.07	0.26	0.20	0.63	0.71	6.32

3.2.4 REGIONAL LAND USE

Much of the native habitat in the project region has been converted to agricultural production, oil field development, urban development, and associated infrastructure (e.g., highways, water conveyance facilities, transmission lines), but remnant stands of native habitat exist at scattered localities. Most of the existing native habitat occurs as recovered lands that have at one time been disturbed by dryland farming, extensive sheep and/or cattle grazing, oil extraction activities, or other causes. Some of the lands containing remaining native habitat have subsurface oil reserves, and oil extraction activities have caused varying levels of disturbance. Much of the remaining native habitat within the region occurs on lands owned and managed by the Bureau of Land Management (BLM). Extensive public and protected land lies to the south and west of the project, but land to the north and east is mostly privately owned and not protected.

Several Ecological Preserves/Reserves and other protected lands are located in the region (Figure 3-1):

- The Lokern and Elk Hills Ecological Reserves, which are administered by the CDFW;
- The Tule Elk State Natural Reserve located near Tupman, which is administered by the California Department of Parks and Recreation;
- The Buena Vista Aquatic Recreation Area, which is administered by the County of Kern;
- The Wind Wolves Preserve, which is administered by The Wildlands Conservancy;
- The Bitter Creek National Wildlife refuge, which is administered by the USFWS; and
- The Carrizo Plains National Monument and the Carrizo Plains Ecological Reserve, which are administered by the USFWS and CDFW.

The Permit Area lands are zoned for agricultural uses and are currently under Williamson Act contracts. All sites are disked for weed control on a repeated basis, with the exception of 3-C2, 17-C, and the lower portion of site 9-C. Adequate water for financially viable farm production is not currently available and there are no irrigation systems present on the majority of the parcels. Scattered wells and ponding basins are present on some parcels. A petition to remove the parcels from the Williamson Act contracts was approved by the County of Kern on March 29, 2011.

3.2.5 SOILS

Soils in the project area are highly variable. According to the United States Department of Agriculture (USDA) Soil Conservation Service map for Kern County, nine different soils are within the project sites (Table 3-2; Figure 3-2), as follows:

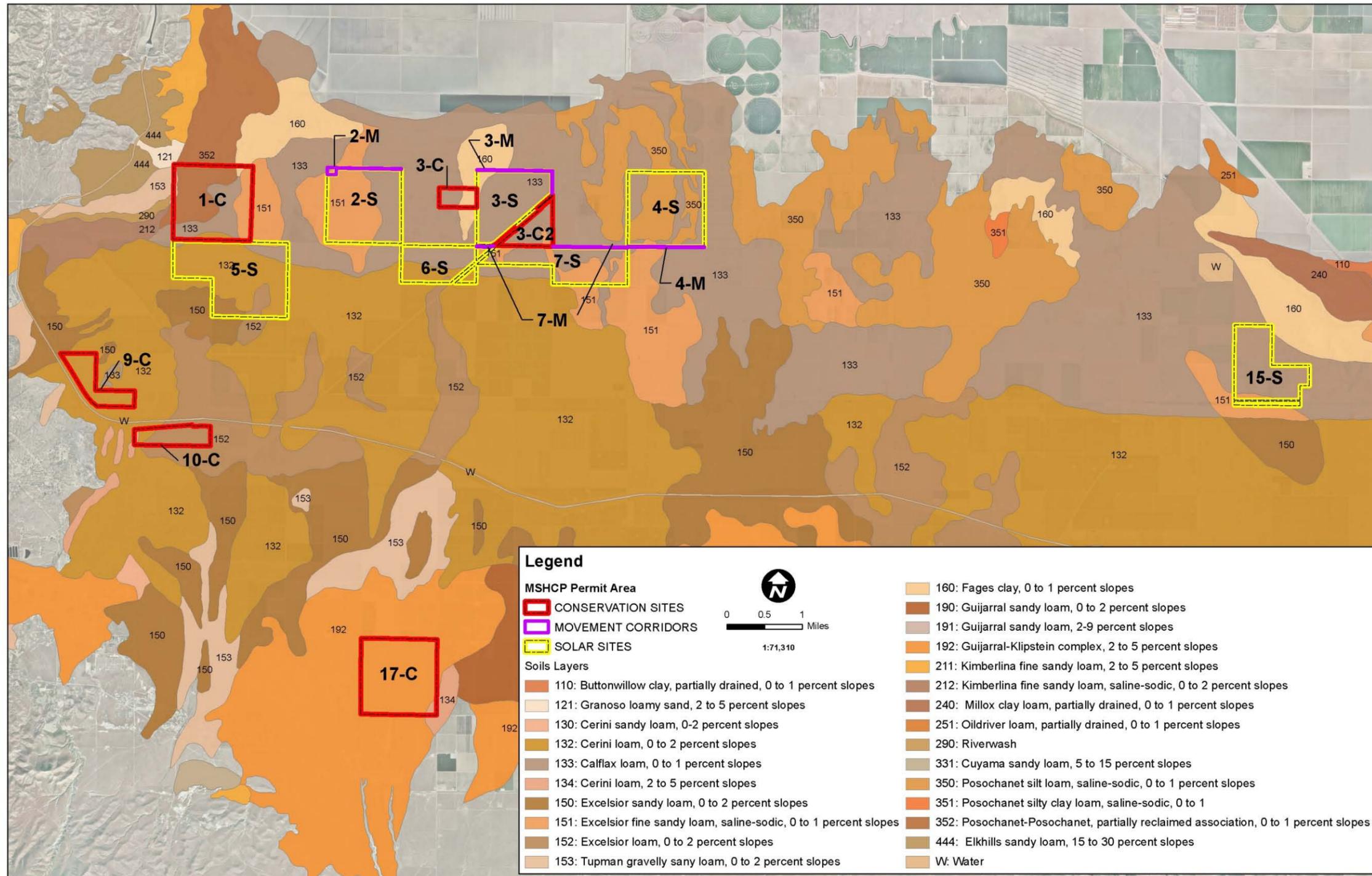
- Cerini loam;
- Calflax loam;
- Excelsior fine sandy loam;
- Excelsior sandy loam;
- Fages clay;
- Posochanet associations;
- Posochanet silt loam (saline-sodic soil);
- Posochanet silty clay loam (saline-sodic soil);
- Tupman gravelly sandy loam; and
- Gujarral-Klipstein complex.

3.2.6 HYDROLOGY

The Maricopa Sun Solar Complex project is located within a semi-arid region, which relies on rainfall, groundwater, and the Kern River for its water supply. Most rainfall occurs in the winter and spring, as is typical for areas with this climate.

Table 3-2
Soil Types Present on the
Maricopa Sun Solar Complex Permit Area Lands

Location	Soil Type Present
Site 1-C	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 153-Tupman gravelly sandy loam (0-2 percent slopes), 160-Fages clay (0-1 percent slopes), and 352-Posochanet-Posochanet (partially reclaimed association, 0-1 percent slopes)
Site 2-S, 2-M	133-Calflax loam (0-1 percent slopes) and 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
Site 3-S, 3-M	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
Site 3-C	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
Site 3-C2	133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
Site 4-S, 4-M	133-Calflax loam (0-1 percent slopes) and 350-Posochanet silt loam (saline-sodic, 0-1 percent slopes)
Site 5-S	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 150-Excelsior sandy loam (0-2 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 152-Excelsior loam (0-2 percent slopes)
Site 6-S	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
Site 7-S, 7-M	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
Site 9-C	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 150-Excelsior sandy loam (0-2 percent slopes)
Site 10-C	132/134-Cerini loam (0-2 percent slopes/2-5 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
Site 15-S	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic; 0-2 percent slopes), and 160-Fages clay (0-1 percent slopes)
Site 17-C	134-Cerini loam (0-2 percent slopes) and 192-Guijarral-Klipstein complex (2 -5 percent slopes)



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USDA SOILS MAP,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 2

The only significant water course in the immediate area of the Project site is the Kern River. The Kern River begins on the western slope of Mount Whitney in the southern Sierra Nevada Mountains and flows southwest. Several minor streams flow into the Kern River, which exists as a contained basin except during high runoff years. The Kern River is fully diverted and used (Kern County Planning and Community Development Department 2010); however, during very wet years, the Kern River reaches the flood channel located on the west of the valley floor and carries water into the Buena Vista Lake Basin that is subject to flooding and ponding (USDA 2009). Other sources of water in the Buena Vista Lake Basin include intermittent streams from the south, such as Bitter Creek, Santiago Creek, Los Lobos Creek, the San Emigdio Creek complex, Pleito and Pleitito Creeks, the Salt Creek complex, and Tecuya Creek, which drain the San Emigdio Mountains portion of the Transverse Ranges. These waters are largely dispersed before reaching the historic Buena Vista Lake Bed. The drainage ways are dry much of the year but carry an extremely heavy flow during thunderstorms and spring runoff (USDA 2009).

A portion of the project area is currently mapped by the Federal Emergency Management Agency (FEMA) as Flood Zone A, and accordingly is within the 100-year flood zone (Figure 3-3). Kern River flows have been regulated since the completion of Isabella Dam in 1953 (Kern County Planning and Community Development Department 2010). Based on flood maps, flooding is likely related to heavy rain fall in the Traverse Range, which flows down the alluvial slopes via streams to the south.

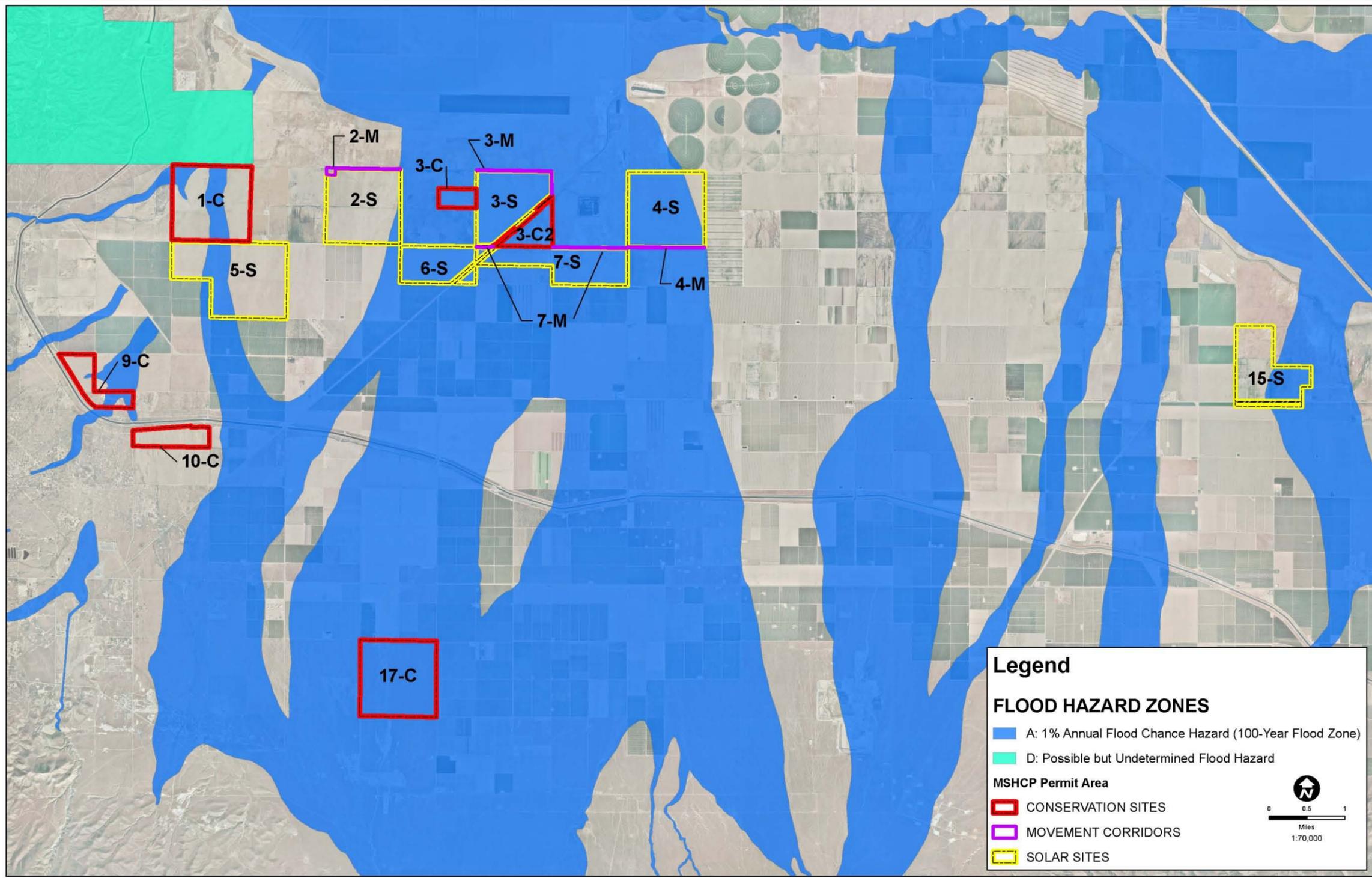
3.2.7 JURISDICTIONAL WETLANDS AND WATERS

The US Army Corps of Engineers (USACE) has regulatory authority over the Clean Water Act (CWA), as provided for by the EPA. The USACE has established specific criteria for the determination of wetlands based upon the presence of wetland hydrology, hydric soils, and hydrophilic vegetation. The presence of wetlands on the Solar Sites was evaluated using these standard wetland delineation criteria. A wetland delineation report was prepared and submitted to the USACE for verification (Quad Knopf 2010b). The presence of wetlands was also evaluated on most of the Conservation Sites. Wetland surveys were conducted on Conservation Sites 1-C, 3-C2, 9-C, and 10-C, including areas within 100 feet of their perimeters (Appendix G). Conservation Sites 3-C and 17-C were not surveyed.

Wetlands, streams, reservoirs, sloughs, and ponds typically meet the criteria for federal jurisdiction under Section 404 of the CWA and state jurisdiction under the Porter-Cologne Water Quality Control Act. Streams and ponds typically meet the criteria for state jurisdiction under Section 1602 of the California Fish and Game Code.

Four types of wetlands and other waters were identified to occur within, or immediately adjacent to the Solar Sites (Quad Knopf 2010a).

- Freshwater emergent wetland
- Waters of the U.S.
- Artificial ponding basins
- Unlined canals



FLOOD HAZARD MAP,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 3

Wetlands that are present on the Solar Sites include one Freshwater Emergent wetland that has been disked (located within Site 2-S). One ponding basin occurs adjacent to the south side of Site 7-S, but this basin is outside of the Permit Area (Appendices B and G). Non-wetland features present include a tributary, two unlined canals, and one “other water.” Within the Conservation Sites are one tributary and one large intermittent wash. No wetlands were identified within the Conservation Sites.

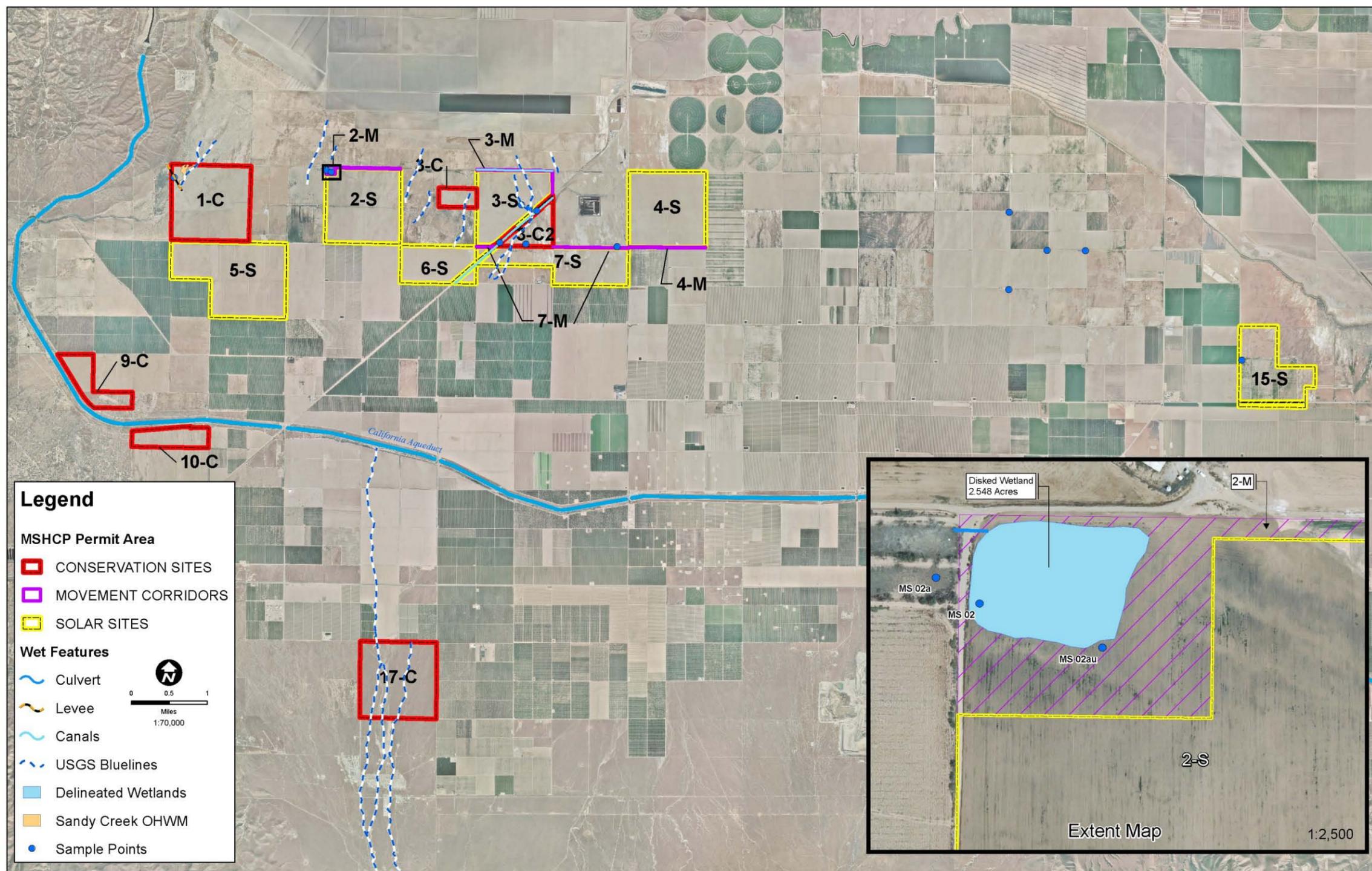
The wetland and non-wetland features are described in Table 3-3 and in the following paragraphs (Quad Knopf 2010b). A wetland delineation map is presented on Figure 3-4.

**Table 3-3
Wetlands and Other Waters Identified within the
Maricopa Sun Solar Complex Permit Area**

Wetland	Location	Type	Acreage/Length
MS 02	Site 2-S	Freshwater Emergent (PEMFX)	2.55 acres
MS 05	South of Site 7-S, not in Permit Area.	Ponding Basin (PUBFX)	3.88 acres
Other Waters			
Tributary	Site 1-C	Tributary	10.45 acres/3,887 feet
Blue-line drainages	Site 17-C	Large Intermittent Wash	2.42 acres, 20 feet by 1 mile long
Canal #1	Site 3-S	Unlined Canal	0.97 acres/5,288 feet
Canal # 2	Sites 6-S and 7-S	Unlined canal	2.06 acres/8,964 feet

Freshwater Emergent Wetland

Based upon a review of the Wetland Delineation report (Quad Knopf 2010a) and a site visit to verify those findings by USACE, the only jurisdictional wetland within the Solar Sites is the freshwater emergent wetland in the northwest corner of Site 2-S. This wetland will be incorporated into the Movement Corridor that traverses the north portion of that site. The burned root crowns of common cattails (*Typha latifolia*), an obligate wetland indicator, are clearly visible in the disked soil, and the soil is hydric. This wetland lies within a shallow basin and is approximately 2.55 acres in extent (Table 3-3). Immediately adjacent, but outside the project boundary, is an artificially bermed ponding basin, which also meets USACE wetland criteria. This ponding basin is all that remains of the once more extensive wetland mapped by the National Wetland Inventory (NWI) at this site. The land around these features is disked. The remnant wetland on Site 2-S and the wetland to the west that occurs off site are connected by a culvert that crosses under a dirt road that separates these two wetland features. This wetland area will not be impacted by the project, and exclusion barrier fencing will be established between the wetland and the work area to eliminate the potential for any adverse affects to the wetland. The wetland area on Site 2-S will be enhanced by cessation of diskings.



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WETLAND DELINEATION MAP,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 4

Artificial Ponding Basins

One artificial ponding basin that meets the criteria for wetlands was found south of Site 7-S, off of but adjacent to the Permit Area. This basin is classified by the Cowardin System as PUBFx (Palustrine, Unconsolidated Bottom, Semi-permanently flooded, excavated). This feature is a narrow pond running east-west, 3.88 acres in extent (Table 3-3). Upland habitat adjacent to this wetland is ruderal. The outflow of this basin feeds into a channel off site that runs to the north and has tamarisk (*Tamarix chinensis*) and Fremont cottonwood (*Populus fremontii*) along the banks. Quailbush (*Atriplex lentiformis*) and five-hook bassia (*Bassia hyssopifolia*) are profuse in the basin, and this feature exhibits hydric soils and wetland hydrology. Two similar features were mapped by the NWI immediately to the south, but these have been removed sometime in the past and are no longer present. This pond and the associated habitat will not be impacted by the project, and exclusion barrier fencing will be established between this pond and the work area to eliminate the potential for any impacts to this area.

Other Waters

A Water of the U.S. is located within the northeast portion of Site 1-C. Site 1-C is a Conservation Site and the jurisdictional waters within Site 1-C will be avoided and not disturbed by construction or conservation activities, improvements or enhancements. Several blue-line intermittent streams occur on Sites 3-S, 3-C, 3-C2, and 7-S. These are isolated waters that currently do not exhibit beds, banks or other characteristics of Waters of the U.S. Based upon site verification by the USACE, these were determined not to be under federal jurisdiction and do not currently meet the criteria of “other waters.”

Non-wetland Features: Unlined Canals

Two unlined canals occur within the Permit Area as described below.

- **Canal #1** collects flood waters and drains the cultivated lands in the northern portion of the Project area. It runs west to east along the northern border of Solar Site. The length of this feature along the northern border of Solar Site 3-S is 5,288 feet, and the average width of the Ordinary High Water (OHW) is eight feet. The OHW acreage of this feature on Site 3-S is 0.97 acres. The bottom is largely unvegetated, but the banks of the canal support annual sunflower (*Helianthus annuus*), quailbush, tamarisk, and five-hook bassia. This feature will not be impacted by the project. A Movement Corridor has been established along this canal and it will be kept intact.
- **Canal #2** has its source at Santiago Creek near State Route 166 and drains orchards to the south of the Permit Area. This feature is an artificial, unlined canal from SR 166 to its terminus along the northeast corner of Solar Site 3-S (Figure 3-4). The OHW width is approximately 10 feet, and the length of the canal on site is 8,964 feet. The OHW acreage of this feature within the Permit Area is 2.06 acres. Quailbush, annual sunflower, and five-hook bassia are present on its banks throughout most of the on-site length. South of the Permit Area, it is mostly devoid of vegetation.

This feature lies within an existing public easement (railway easement). The Solar Development Footprint does not include this easement and this canal will be protected by a mandatory 30-foot setback from the easement.

3.2.8 SITE CHARACTERISTICS

The Project region once supported a wide variety of plant and wildlife species, but much of the diversity and abundance has been reduced and species composition has been altered by dramatic changes in land use. Land use in the region that has contributed to significant declines in plant and wildlife diversity include the conversion of native lands to agriculture, disturbance by oil extraction and associated conveyance structures, urbanization; and the construction of infrastructures and utilities, including pipelines, roads, canals, and power transmission lines. The loss of habitat associated with these disturbances has resulted in many species being listed as threatened or endangered by the CDFW and the USFWS. These species are protected by the FESA and/or the CESA. Other species are listed as species of special concern by the agencies and are afforded a lesser level of protection. Briefly, special-status species are defined as plants and animals that are legally protected under FESA, CESA, or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing (see Section 3.3.1).

The Permit Area of this MSHCP encompasses a total of 5,784.3 acres. The Solar Sites consists of 3,798.2 acres (which include mandatory setbacks and Movement Corridors). The Solar Development Footprints total 3,700.5 acres, and the Movement Corridors encompass 33.8 acres (see Table 2-1).

The seven Solar Sites (Sites 2-S, 3-S, 4-S, 5-S, 6-S, 7-S, and 15-S), including the Movement Corridors, have been disked for weed control on a biannual basis. Due to the lack of available water, none of the land that is proposed for development (Solar Development Footprints) has been utilized in the past eight years for agricultural purposes. All of the land surrounding the proposed project sites is designated and zoned for agriculture and most of it is in active agricultural production, but some isolated parcels are in an unfarmed state and contain some native species (see Section 2.2, Figure 2-2). All of the Solar Sites are kept free of natural vegetative communities through biannual disking of each site. Primarily weedy species sprout between disking activities. The only native plant that sprouts in significant numbers following disking is seepweed (*Suaeda nigra*), which occurs in scattered localities. Some individuals of other species occur incidentally on some of the Solar Sites. Because disking occurs in the spring and fall of each year, the seepweed and other species never become established to any great degree and mostly remain as short seedlings, rarely maturing to established shrubs. Some surrounding parcels contain remnants of native Saltbush Scrub and Alkali Sink Scrub habitat in various sized blocks, which are highly fragmented and isolated from one another. Specific site occurrence information on vegetation is provided in Table 3-4.

Table 3-4
Plant Species Occurring on Solar Sites and
Adjacent Lands of the Maricopa Sun Solar Complex
 (Source: Quad Knopf 2010a, 2010c)

Family Name	Scientific Name	Common Name	Project Site
Amaranthaceae	<i>Amaranthus</i> sp.	Amaranth	Adjacent to Site 4-S
Apocynaceae	<i>Asclepias fascicularis</i>	Narrow-leaf milkweed	Adjacent to Site 15-S
Asclepiadaceae	<i>Asclepias fascicularis</i>	Mexican milkweed	Adjacent to Site 15-S
	<i>Centaurea solstitialis</i>	Yellow starthistle	Occurring on Site 15-S
	<i>Helianthus annuus</i>	Annual sunflower	Occurring on Site 3-S
	<i>Helianthus</i> sp.	Sunflower	Adjacent to Site 3-S
	<i>Baccharis salicifolia</i>	Mulefat	Adjacent to Site 15-S
	<i>Achillea millefolium</i>	Yarrow	Adjacent to Site 15-S
	<i>Isocoma acradenia</i>	Alkali goldenbush	Occurring on Site 2-S, 15-S
	<i>Lactuca serriola</i>	Wire lettuce	Occurring on Site 3-S, 5-S
	<i>Xanthium strumarium</i>	Common cocklebur	Occurring on Site 3-S
	Boraginaceae	<i>Amsinckia menziesii</i>	Fiddleneck
<i>Heliotropium curassavicum</i>		Salt heliotrope	Occurring on Site 2-S, 3-S
Brassicaceae	<i>Sisymbrium irio</i>	London rocket	Occurring on Site 3-S, 5-S, 6-S, 15-S
	<i>Brassica nigra</i>	Black mustard	Occurring on Site 3-S

The six Conservation Sites (Site 1-C, Site 3-C, Site 3-C2, Site 9-C, Site 10-C, and Site 17-C) total 1,894.4 acres. The Solar Sites will be converted to Conservation Sites once the solar facilities are decommissioned, resulting in a total of 5,692.6 acres of compensatory lands provided at the end of the project (see Table 2-1). The Movement Corridors will be managed as conservation land during the life of the project, but will be conserved in perpetuity along with the Solar Sites and Conservation Sites once the Project is decommissioned. With the exception of Sites 3-C2, the southern 83.25 acres of Site 9-C, and all of 17-C, all of the lands within the Permit Area are periodically disked for weed control. Site 3-C2 was previously disked, but has not been disked for some time and has recovered from previous disturbances. The only native plant that sprouts in significant numbers following disking is seepweed, which occurs in scattered localities, particularly on Site 3-C. Site 1-C also contains some scattered saltbush shrubs and *Isocoma*, primarily along the levee in the northwest corner of the site (which totals 2.44 acres), but some scattered quailbush shrubs survive disking. Native saltbush scrub habitat occurs on 83.25 acres of Site 9-C, and all of Site 17-C is vegetated with a matrix of annuals grassland, saltbush scrub, and *Isocoma*. Forty-four plant species occur within the Conservation Sites, Movement Corridors, and surrounding adjacent lands (Table 3-5).

Table 3-5
Plant Species Occurring within Conservation Sites, Movement Corridors, and
Adjacent Lands of the Maricopa Sun Solar Complex

(Source: Quad Knopf 2010a, 2010c)

Family Name	Scientific Name	Common Name	Project Site	
Asteraceae	<i>Ambrosia acanthicarpa</i>	Annual bursage	Adjacent to Site 10-C	
	<i>Centaurea solstitialis</i>	Yellow starthistle	Adjacent to Sites 9-C, 10-C	
	<i>Conyza coulteri</i>	Coulter's conyza	Adjacent to Sites 9-C, 10-C	
	<i>Hemizonia kelloggii</i>	Kellogg's tarweed	On and adjacent to Site 9-C	
	<i>Heterotheca grandiflora</i>	Telegraph weed	On and adjacent to Site 9-C	
	<i>Helianthus annuus</i>	Annual sunflower	Occurring on Sites 3-C, 3-C2, 3-M; Adjacent to Site 10-C	
	<i>Helianthus</i> sp.	Sunflower	Adjacent to Site 3-C2, 3-M	
	<i>Isocoma acradenia</i>	Alkali goldenbush	Occurring on Sites 2-M, 9-C; Adjacent to Sites 9-C, 10-C,	
	<i>Lactuca serriola</i>	Wire lettuce	Occurring on Sites 9-C, 3-C, 3-C2, 3-M; Adjacent to Site 9-C	
	Boraginaceae	<i>Xanthium strumarium</i>	Common cocklebur	Occurring on Sites 3-C, 3-C2, 3-M
<i>Amsinckia menziesii</i>		Fiddleneck	Occurring on Sites 1-C, 2-M, 3-C, 3-C2, 3-M, 9-C, 10-C; Adjacent to Sites 9-C, 10-C	
Brassicaceae	<i>Heliotropium curassavicum</i>	Salt heliotrope	Occurring on Sites 3-S, 3-C, 3-C2, 3-M	
	<i>Sisymbrium irio</i>	London rocket	Occurring on Sites 1-C, 3-S, 3-C, 3-C2, 3-M, 9-C	
	<i>Brassica nigra</i>	Black mustard	Occurring on Sites 3-S, 3-C, 3-C2, 3-M	
	<i>Lepidium</i> sp.	Peppergrass	Adjacent to Site 10-C	
Chenopodiaceae	<i>Raphanus sativus</i>	Radish	Adjacent to Site 9-C	
	<i>Sisymbrium orientale</i>	Eastern rocket	Adjacent to Site 9-C	
	<i>Salsola tragus</i>	Russian thistle	Adjacent to Sites 9-C, 10-C; Occurring on Sites 3-C, 3-C2, 3-M, 9-C, 10-C	
	<i>Bassia hyssopifolia</i>	Five-hook bassia	Occurring on Sites 3-C, 3-C2, 3-M, 10-C ; Adjacent to Site 10-C	
	<i>Atriplex lentiformis</i>	Quailbush	Occurring on Sites 1-C, 3-C, 3-C2, 3-M, 9-C, Adjacent to Site 10-C	
	<i>Chenopodium album</i>	Lamb's quarters "weedy chenopods"	Occurring on Sites 3-S, 3-C, 3-C2, 3-M	
	<i>Suaeda nigra</i>	Seepweed	Occurring on Sites 3-S, 3-C, 3-C2, 3-M, 17-C	
	<i>Atriplex polycarpa</i>	Allscale saltbush	Occurring on Site 9-C; Adjacent to Sites 9-C, 10-C	
	Convolvulaceae	<i>Convolvulus arvensis</i>	Orchard bindweed	Occurring on Site 1-C
		<i>Convolvulus</i> sp.	Morning glory	Occurring on Site 1-C
Euphorbiaceae	<i>Eromocarpus setigerus</i>	Dove weed	Adjacent to Site 10-C	
Lamiaceae	<i>Trichostema ovatum</i>	Vinegar Weed	Occurring on Site 17-C	
	<i>Marrubium vulgare</i>	White horehound	Adjacent to Site 10-C	
	<i>Malacothamnus</i> sp.	Bushmallow	Adjacent to Site 9-C	
Plantaginaceae	<i>Bromus diandrus</i>	Ripgut brome	Occurring on Site 9-C; Adjacent to Site 9-C	
Poaceae	<i>Bromus hordeaceus</i>	Soft brome	Occurring on 17-C; Adjacent to Sites 9-C and 10-C	
	<i>Bromus madritensis</i> ssp. <i>rubens</i>	Red brome	Occurring on Sites 2-M, 9-C; Adjacent to Site 10-C	

Table 3-5 (continued)
Plant Species Occurring within Conservation Areas, Movement Corridors, and
Adjacent Lands of the Maricopa Sun Solar Complex
 (Source: Quad Knopf 2010a, 2010c)

Family Name	Scientific Name	Common Name	Project Site
Geraniaceae	<i>Erodium</i> sp.	Filaree	Occurring on Site 9-C; Adjacent to Site 9-C
	<i>Cynodon dactylon</i>	Bermuda grass	Occurring on Site 1-C
	<i>Distichlis spicata</i>	Saltgrass	Occurring on Sites 3-C, 3-C2, 3-M
	<i>Schismus</i> sp.	Mediterranean barley	Occurring on Sites 2-M, 3-S, 3-C, 3-C2, 3-M, 9-C; Adjacent to Site 9-C
Rosaceae	<i>Prunus dulcis</i>	Almond	Adjacent to Site 5-S
Salicaceae	<i>Salix laevigata</i>	Red willow	Adjacent to Site 15-S
	<i>Salix goodingii</i>	Black willow	Adjacent to Site 15-S
	<i>Salix</i> sp.	Willow	Occurring on Site 2-S, 2-M
Solanaceae	<i>Datura wrightii</i>	Jimsonweed	Occurring on Site 5-S; Adjacent to Site 9-C
Tamaricaceae	<i>Nicotiana glauca</i>	Tree tobacco	Adjacent to Site 10-C
	<i>Tamarix chinensis</i>	Tamarisk	Occurring on Sites 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, 3-M, 15-S, 17-C; Adjacent to Sites 9-C, 10-C, 15-S
Typhaceae	<i>Typha latifolia</i>	Narrowleaf cattail	Adjacent to Site 15-S

General wildlife observed in 2009, 2010, and 2012 (Quad Knopf 2010c, 2010d, 2012) (Appendix G) during visual surveys, small mammal trapping studies, focused surveys for the San Joaquin kit fox, and focused surveys for blunt-nosed leopard lizard (*Gambelia sila*) in and surrounding the Permit Area includes coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), desert cottontail (*Sylvilagus audubonii*), black-tailed jack rabbit (*Lepus californicus*), deer mouse (*Peromyscus maniculatus*), Heermann's kangaroo rat (*Dipodomys heermanni*), barn owl (*Tyto alba*), red-tailed hawk (*Buteo jamaicensis*), lesser nighthawk (*Chordeiles acutipennis*), American kestrel (*Falco sparverius*), greater roadrunner (*Geococcyx californianus*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), California horned lark (*Eremophila alpestris actia*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), California whiptail (*Aspidoscelis tigris munda*), common side-blotched lizard (*Uta stansburiana*), and western toad (*Anaxyrus boreas*). Specific site occurrence information for these species is provided in Table 3-6.

Table 3-6
Wildlife Species Occurring on Permit Area Lands and
Lands Adjacent to the Maricopa Sun Solar Complex
 (Source: Quad Knopf 2010a)

Scientific Name	Common Name	Project Site
Amphibians		
<i>Anaxyrus sp. or Spea sp.</i>	toad	Sites 3-S, 3-M, 3-C, 3-C2,
Reptiles		
<i>Aspidoscelis tigris munda</i>	California whiptail	Sites 3-S, 3-M, 3-C, 3-C2,
<i>Crotalus oreganus</i>	western rattlesnake	Site 15-S
<i>Gambelia sila</i>	blunt-nosed leopard lizard	Adjacent to Sites 2-S, 2-M, 3-S, 3-M, 3-C, 3-C2, 17-C
<i>Phrynosoma blainvillii</i>	California horned lizard	Adjacent to Sites 3-S, 3-M, 3-C, 3-C2,
<i>Uta stansburiana</i>	common side-blotched lizard	Sites 3-S, 3-M, 3-C, 3-C2, 15-S
Birds		
<i>Athene cunicularia</i>	western burrowing owl	Sites 3-S, 3-C2, 6-S, 7-S, 9-C; Adjacent to Sites 1-C, 2-S, 2-M, 3-C, 5-S, 10-C, 15-S
<i>Buteo swainsoni</i>	Swainson's hawk	Adjacent to Sites 4-S, 4-M
<i>Chordeiles acutipennis</i>	Lesser nighthawk	Site 15-S
<i>Circus cyaneus</i>	northern harrier	Site 15-S, Adjacent to Sites 1-C, 3-S, 3-M, 3-C, 3-C2, 4-S, 4-M, 6-S
<i>Corvus corax</i>	raven	Sites 1-C, 2-S, 2-M, 15-S
<i>Corvus brachyrhynchos</i>	crow	Site 15-S
<i>Elanus leucurus</i>	white-tailed kite	Site 5-S
<i>Eremophila alpestris actia</i>	California horned lark	Site 15-S
<i>Falco sparverius</i>	American kestrel	Site 15-S
<i>Lanius ludovicianus</i>	loggerhead shrike	Site 17-C
<i>Tyto alba</i>	barn owl	Sites 3-S, 3-M, 3-C-3, 3-C2, 5-S, 15-S
<i>Zenaidura macroura</i>	mourning dove	Site 15-S
Mammals		
<i>Ammospermophilus nelsoni</i>	Nelson's antelope squirrel	Site 9-C; Adjacent to Sites 1-C, 10-C, 17-C
<i>Spermophilus beecheyi</i>	California ground squirrel	Site 15-S
<i>Peromyscus maniculatus</i>	deer mouse	Sites 1-C, 2-S, 2-M, 3-S, 3-M, 3-C, 3-C2, 9, 10, 15-S
<i>Dipodomys nitratoides nitratoides</i>	Tipton kangaroo rat	Sites 1-C, 9-C; Adjacent to Sites 2-S, 2-M, 3-S, 3-M, 3-C, 3-C2, 10-C
<i>Dipodomys heermanni</i>	Heermann's kangaroo rat	Sites 1-C, 9-C; Adjacent to Sites 2-S, 2-M, 3-S, 3-C, 3-C2, 3M, 10-C
<i>Onychomys torridus tularensis</i>	Tulare grasshopper mouse	Sites 1-C, 6-S, 9-C, 15-S
<i>Lepus californicus</i>	black-tailed jackrabbit	Sites 1-C, 2-S, 2-M, 3-S, 3-M, 3-C, 3-C2, 4-S, 4-M, 7-S, 7-M, 15-S
<i>Sylvilagus audubonii</i>	cottontail	Sites 1-C, 2-S, 2-M, 3-S, 3-M, 3-C, 3-C2, 4-S, 4-M, 7-S, 7-M, 15-S
<i>Felis catus</i>	house cat	Site 6-S
<i>Taxidea taxus</i>	American badger	Site 17-C
Canidae	unknown canid	Site 15-S
<i>Canis familiaris</i>	domestic dog	Sites 7-S, 7-M, 15-S
<i>Canis latrans</i>	coyote	Sites 1-C, 3-S, 3-M, 3-C, 3-C2, 5-S, 15-S
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	Adjacent to Sites 1-C, 15-S, 17-C

A search of existing databases and literature was conducted to determine sensitive biological resources occurring in the Project region. Information was obtained from the California Natural Diversity Database (CNDDDB) (CDFG 2009), California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2009), Recovery Plan for the Upland Species of San Joaquin Valley, California (USFWS 1998), and the Federal Endangered and Threatened Species List (USFWS 2009). Five sensitive natural communities, twenty special status plant species (Table 3-7), and thirty-nine special status wildlife species (Table 3-8) are known to occur within the Project region. The distributions of these species in the Project region, based upon records available from the CNDDDB, are provided in Figures 3-5A-D. Detailed descriptions of the determination of special-status species to be covered under the MSHCP are provided below. Special-status species that are determined to be present or to become present on the Permit Area and for which take is authorized under the MSHCP are referred to as “Covered Species.” Further details on the criteria for determining Covered Species are provided below.

There are CNDDDB records within a five-mile radius of the Permit Area for the following special status wildlife species.

- Blunt-nosed leopard lizards (*Gambelia sila*)
- San Joaquin kit foxes (*Vulpes macrotis mutica*)
- Tipton kangaroo rats (*Dipodomys nitratooides nitratooides*)
- Buena Vista Lake shrews (*Sorex ornatus relictus*)
- Nelson’s antelope squirrels (*Ammospermophilus nelsoni*)
- American badgers (*Taxidea taxus*)
- Western burrowing owls (*Athene cunicularia*)

Quad Knopf found no CNDDDB records indicating that the California horned lizards (*Phrynosoma blainvillii*), Swainson’s hawks (*Buteo swainsoni*), white-tailed kites (*Elanus leucurus*), California horned larks (*Eremophila alpestris actia*), or northern harriers (*Circus cyaneus*) occur within a five-mile radius of the Project sites, although these special status species were observed during the 2009, 2010 and 2012 studies conducted on the project sites (Quad Knopf 2010c 2012) (Appendix G). Special-status wildlife species are generally not present on the Solar Sites, but primarily exist in scattered, isolated populations within the southern San Joaquin Valley, particularly north and east of the California Aqueduct where the Project is primarily located. The special-status species observed either on the Permit Area or on adjacent lands include the blunt-nosed leopard lizard, San Joaquin kit fox, Tipton kangaroo rat, Nelson’s antelope ground squirrel, western burrowing owl, and American badger (see Table 3-6 and Appendix B).

Table 3-7
Sensitive Vegetation Communities and Special Status Plant Species
Occurring in the Region of the Maricopa Sun Solar Habitat Conservation Plan Area
 (Source: CDFG 2009, CNPS 2009, and USFWS 2009)

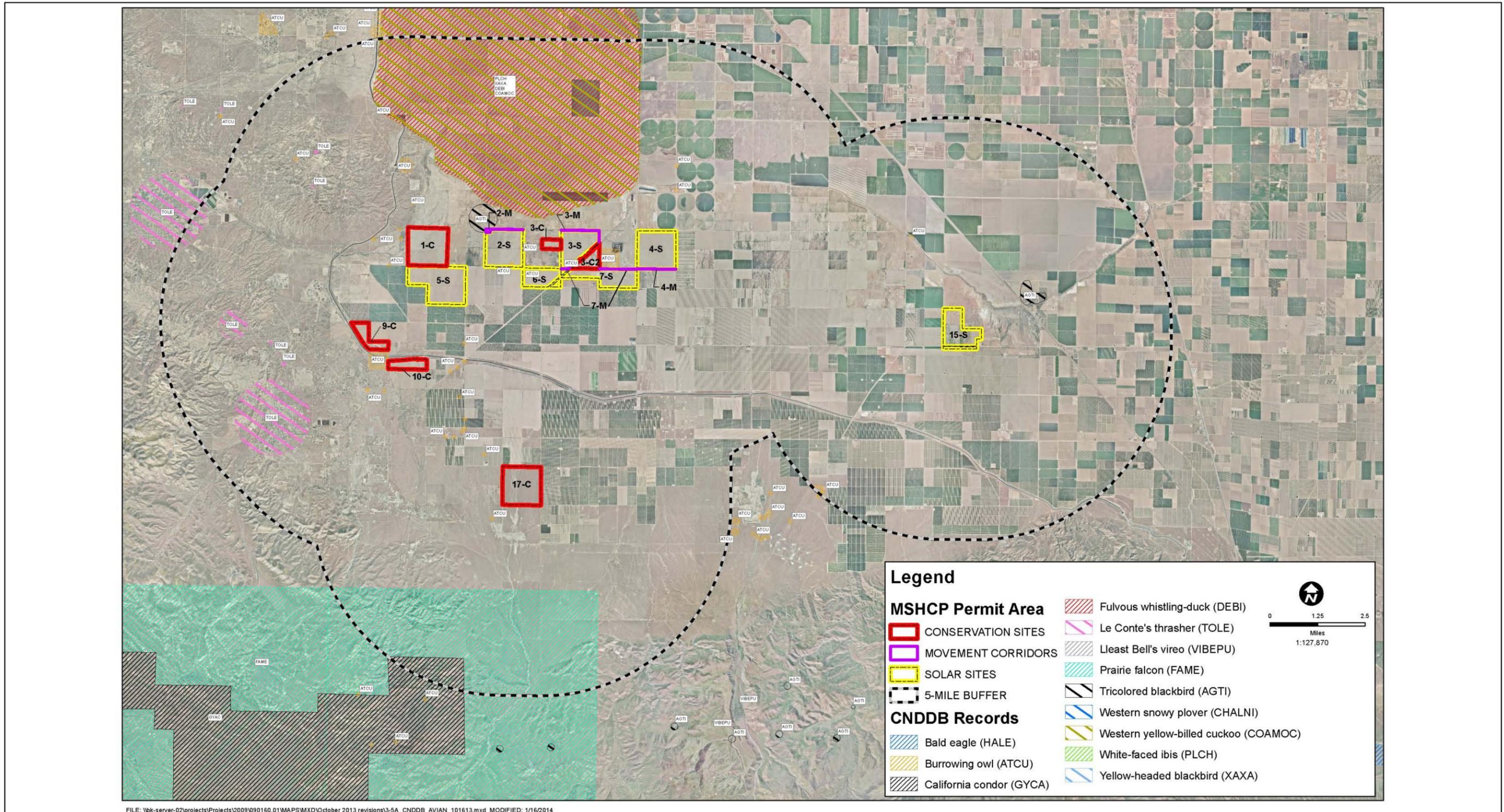
Scientific Name	Common Name	Status
Sensitive vegetative communities		
Great Valley Cottonwood Riparian Forest	Great Valley Cottonwood Riparian Forest	Protected under CEQA
Great Valley Mesquite Scrub	Great Valley Mesquite Scrub	Protected under CEQA
Valley Sacaton Grassland	Valley Sacaton Grassland	Protected under CEQA
Valley Saltbush Scrub	Valley Saltbush Scrub	Protected under CEQA
Valley Sink Scrub	Valley Sink Scrub	Protected under CEQA
Plants		
<i>Allium howellii</i> var. <i>clokeyi</i>	Mt. Pinos onion	1B.3
<i>Astragalus hornii</i> var. <i>hornii</i>	Horn's milk-vetch	1B.1
<i>Atriplex cordulata</i>	heartscale	1B.2
<i>Atriplex tularensis</i>	Bakersfield smallscale	CE, 1B.1
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills crownscale	1B.2
California (<i>Erodium</i>) <i>macrophyllum</i>	round-leaved filaree	1B.1
<i>Caulanthus californicus</i> (<i>Stanfordia californica</i>)	California jewel-flower	FE, CE, 1B.1
<i>Caulanthus coulteri</i> var. <i>lemmonii</i>	Lemmon's jewelflower	1B.2
<i>Cirsium crassicaule</i>	slough thistle	1B.1
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	Hispid bird's beak	1B.1
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2
<i>Eremalche kernensis</i>	Kern mallow	FE, 1B.1
<i>Eriastrum hooveri</i>	Hoover's eriastrum	4.2
<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i>	Tejon poppy	1B.1
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	1B.1
<i>Layia hetereotricha</i>	oale-yellow layia	1B.1
<i>Layia leucopappa</i>	Comanche Point layia	1B.1
<i>Monardella linoides</i> ssp. <i>oblonga</i>	Tehachapi monardella	1B.3
<i>Monolopia congdonii</i>	San Joaquin woollythreads	FE, 1B.2
<i>Stylocline citroleum</i>	oil neststraw	1B.1

Status Definitions

- FE Federally Endangered
- CE California Endangered
- 1B.1 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Seriously Endangered in California
- 1B.2 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Fairly Endangered in California.
- 1B.3 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Not Very Endangered in California
- 4.2. Plants of limited distribution - Watch list, Fairly endangered in California (20-80% occurrences threatened)

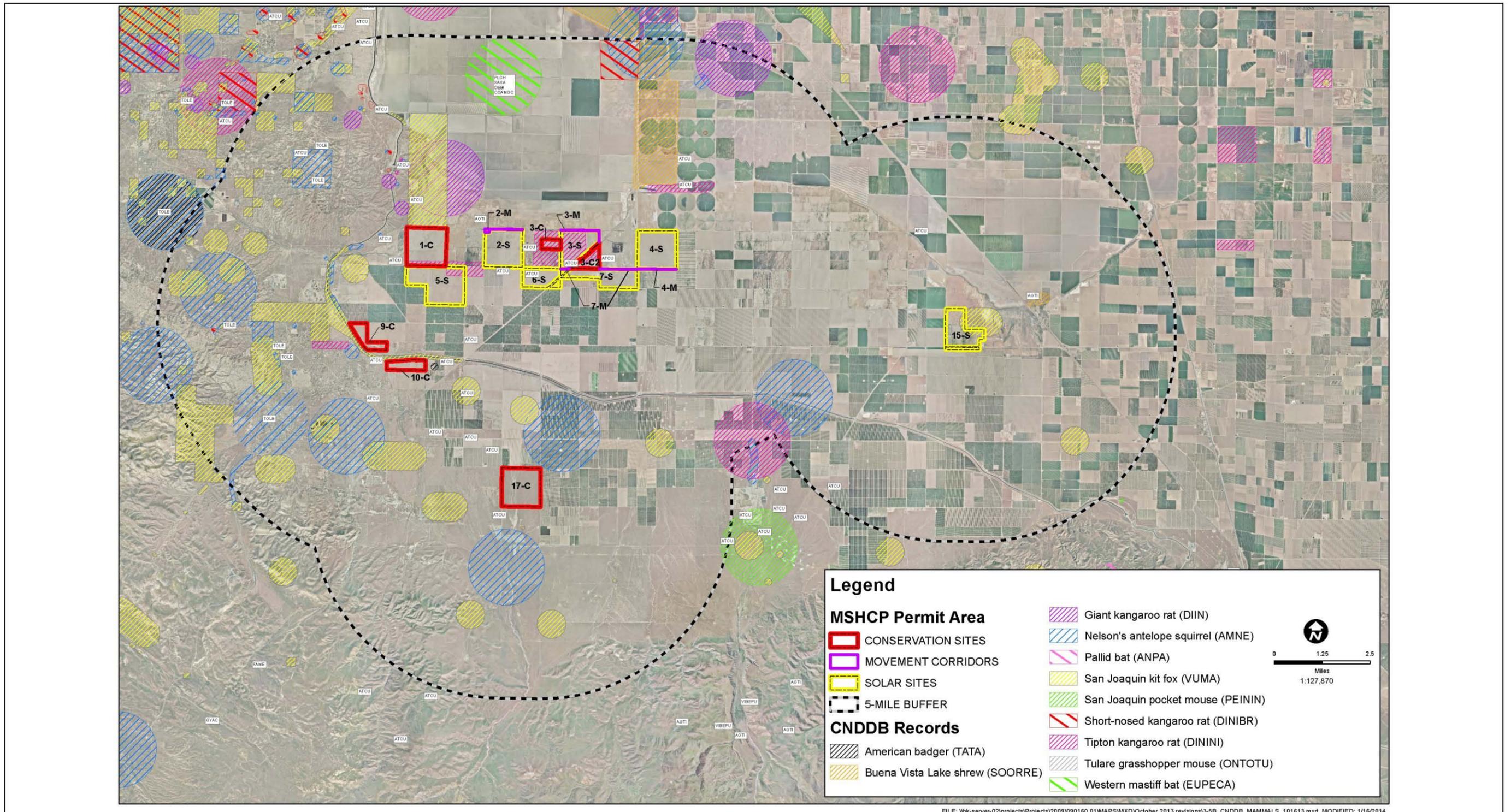
Table 3-8
Special Status Wildlife Species
Occurring in the Region of the Maricopa Sun Solar Habitat Conservation Plan Area
 (Source: CDFG 2009, CNPS 2009, and USFWS 2009)

Scientific Name	Common Name	Status
Invertebrates		
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT
<i>Euproserpinus euterpe</i>	Kern primrose sphinx moth	FT
Fishes		
<i>Hypomesus transpacificus</i>	Delta smelt	FT, CT
Amphibians		
<i>Rana aurora draytonii</i>	California red-legged frog	FT
<i>Spea hammondi</i>	western spadefoot	CSC
Reptiles		
<i>Actinemys marmorata pallida</i>	western pond turtle	CSC
<i>Anniella pulchra pulchra</i>	silvery legless lizard	CSC
<i>Gambelia sila</i>	blunt-nosed leopard lizard	CE, FE, CDFW fully protected
<i>Masticophis flagellum ruddocki</i>	San Joaquin whipsnake	CSC
<i>Phrynosoma blainvillii</i>	California horned lizard	CSC
<i>Thamnophis gigas</i>	giant garter snake	FT, CT
Birds		
<i>Agelaius tricolor</i>	tricolored blackbird	CSC
<i>Athene cunicularia</i>	western burrowing owl	CSC
<i>Buteo swainsoni</i>	Swainson's hawk	CSC
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT
<i>Charadrius montanus</i>	mountain plover	CSC
<i>Circus cayaneus</i>	northern harrier	CSC
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	CE
<i>Dendrocygna bicolor</i>	fulvous whistling-duck	CSC
<i>Elanus leucurus</i>	white-tailed kite	CDFW fully protected
<i>Eremophila alpestris actia</i>	California horned lark	CDFW watch list
<i>Falco mexicanus</i>	prairie falcon	CDFW watch list
<i>Gymnogyps californianus</i>	California condor	FE, CE
<i>Lanius ludovicianus</i>	loggerhead shrike	CDFW watch list
<i>Plegadis chihi</i>	white-faced ibis	CDFW watch list
<i>Toxostoma lecontei</i>	Le Conte's thrasher	CSC
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	CSC
Mammals		
<i>Ammospermophilus nelsoni</i>	Nelson's antelope squirrel	CT
<i>Dipodomys ingens</i>	giant kangaroo rat	FE, CE
<i>Dipodomys nitratoides brevinasus</i>	short-nosed kangaroo rat	CSC
<i>Dipodomys nitratoides nitratoides</i>	Tipton kangaroo rat	FE, CE
<i>Eumops perotis californicus</i>	western mastiff bat	CSC
<i>Onychomys torridus tularensis</i>	Tulare grasshopper mouse	CSC
<i>Perognathus inornatus inornatus</i>	San Joaquin pocket mouse	CSC, BLMS
<i>Sorex ornatus relictus</i>	Buena Vista Lake shrew	FE
<i>Taxidea taxus</i>	American badger	CSC
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE, CT



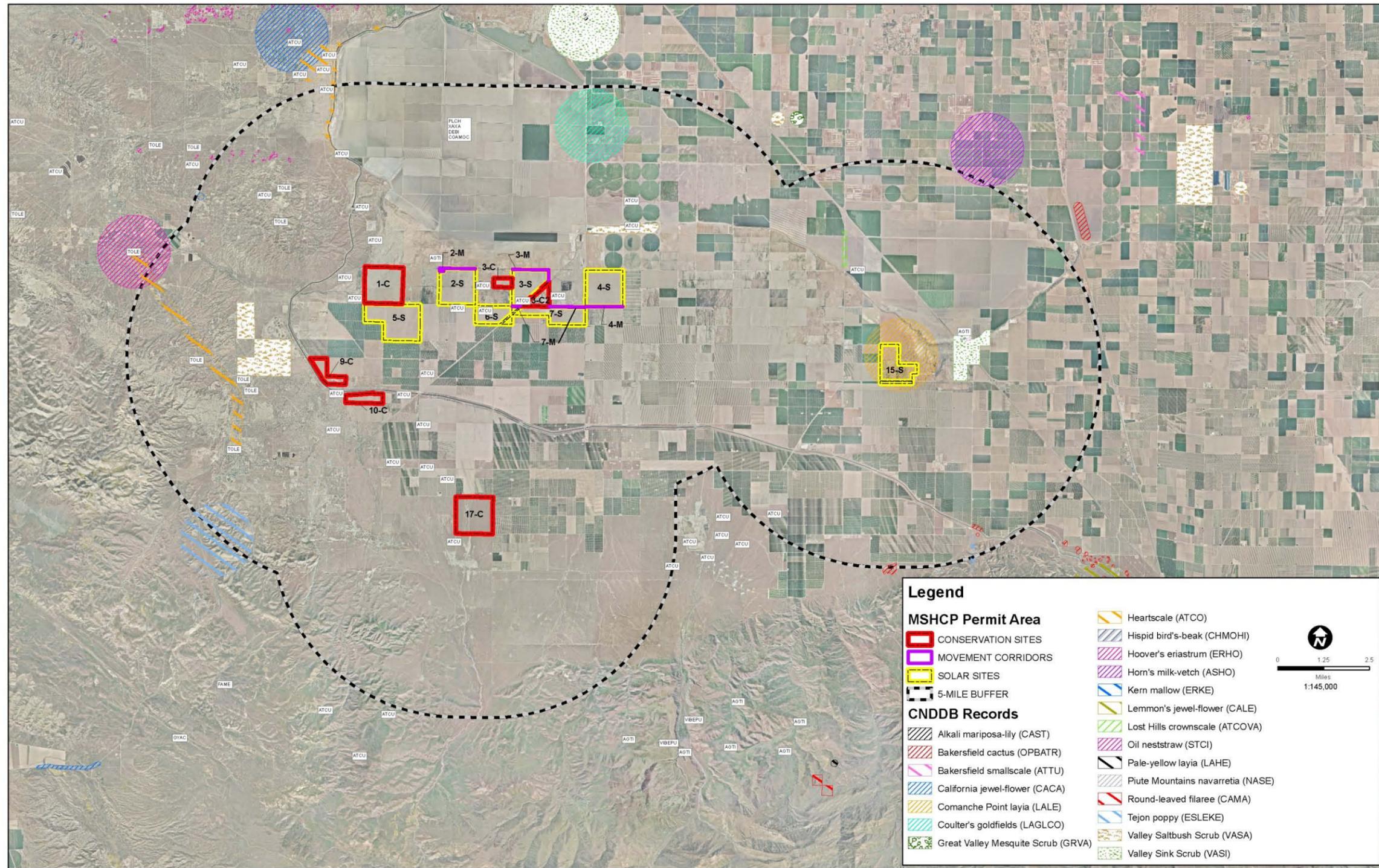
CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDDB) SENSITIVE AVIAN SPECIES OBSERVATIONS,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 5A



CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDDB) SENSITIVE MAMMAL SPECIES OBSERVATIONS,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 5B

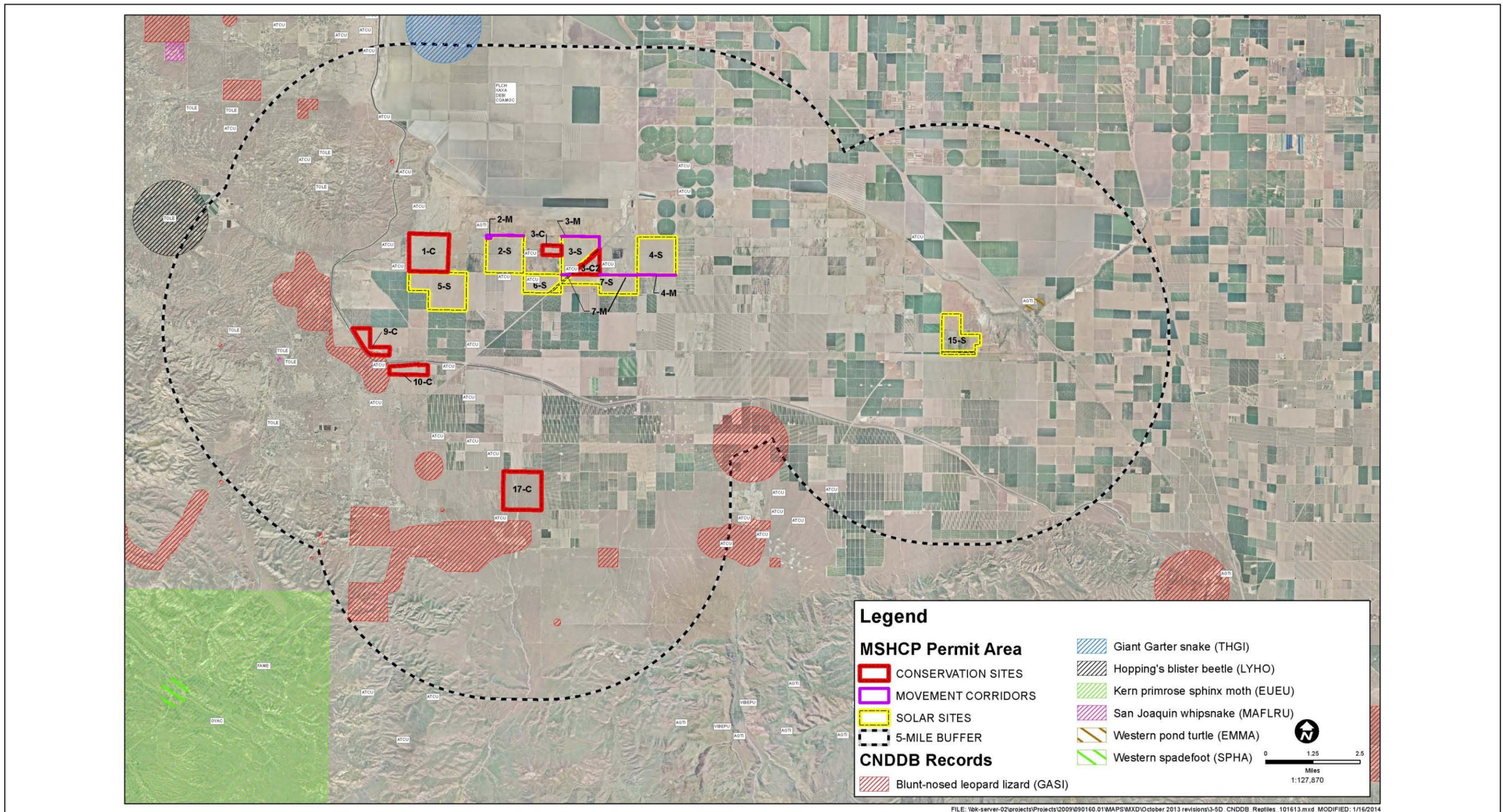


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CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDDB) SENSITIVE PLANT SPECIES OBSERVATIONS,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 5C

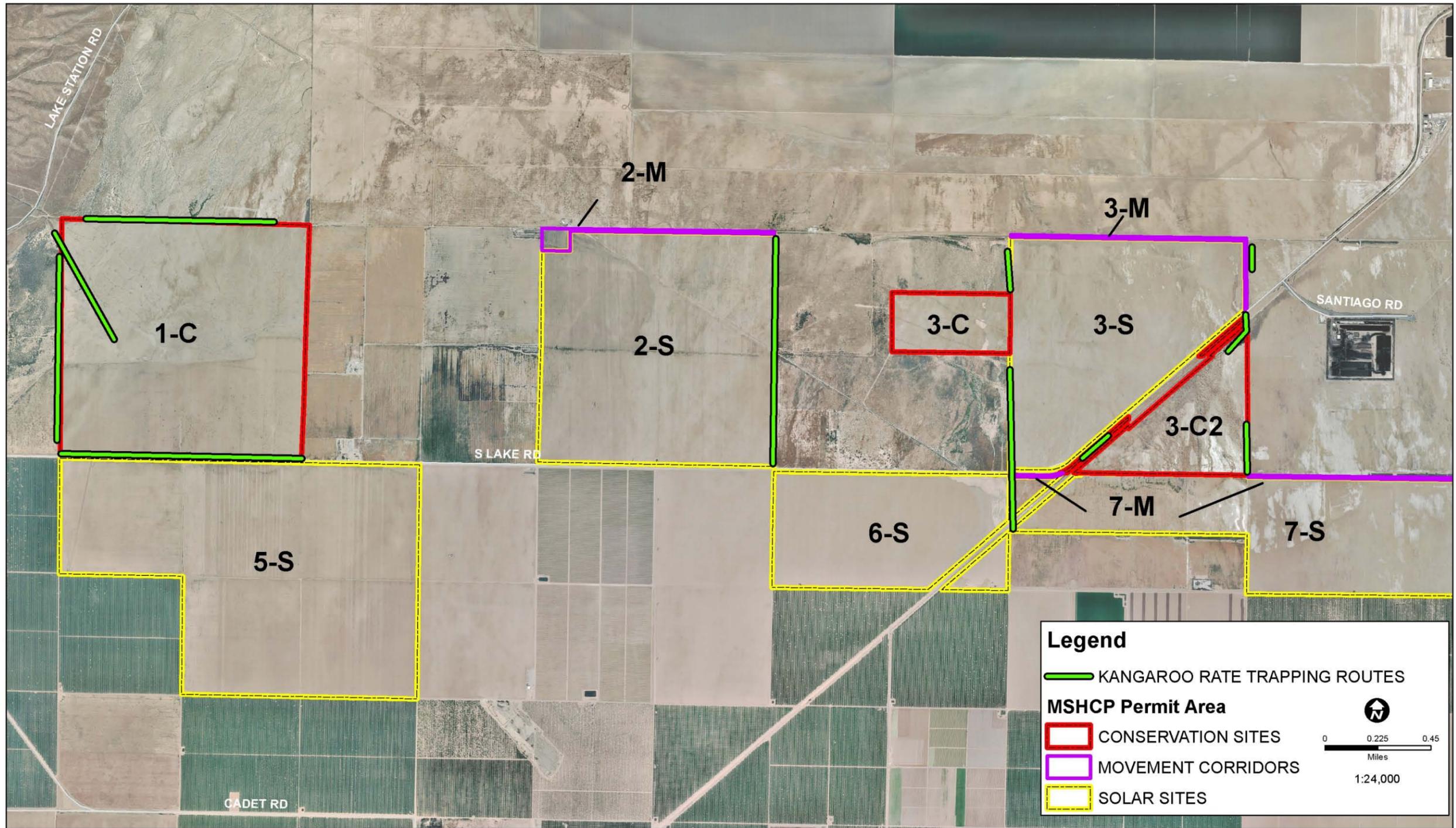


CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDDB) SENSITIVE REPTILE, AMPHIBIAN, INSECT, AND INVERTEBRATE SPECIES OBSERVATIONS, MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure 3 - 5D

An evaluation of the potential for each sensitive natural community and special status plant and animal species is provided below for each site and adjacent lands. The evaluation is based upon extensive site investigations, including:

- Reconnaissance-level “windshield” surveys conducted in 2009 and 2010 (Quad Knopf, 2009; Quad Knopf 2010c) on Sites 1-C, 2-S, 3-C, 3-C2, 3-S, 4-S, 5-S, 6-S, 7-S, and 15-S;
- A reconnaissance-level transect survey was conducted on Site 17-C in 2009 (Quad Knopf 2009) consisting of four, north-south, one-mile-long meandering transects. The four transects were nearly equally spaced across the site and resulted in approximately 25 percent visual coverage of the area;
- Focused surveys were conducted in 2009, 2010, and 2012 (Quad Knopf 2012) (Appendix G) on the various sites including:
 - Pedestrian transect surveys conducted on each Solar Site (Sites 2-S, 3-S, 4-S, 5-S, 6-S, 7-S, and 15-S) and on five of the six Conservation Sites (1-C, 3-C, 3-C2, 9-C, and 10-C), with transects spaced at 100-foot intervals;
 - Protocol-level small mammal trapping (100 traps per linear mile, set and checked for three to four consecutive nights) within the Permit Area and on adjacent lands containing small mammal burrows (Figures 3-6A-B). Trapping was conducted on Sites 1-C, 2-S, 3-C2, within the native habitat occurring on Site 9-C, on lands adjacent to the eastern edge of Site 2-S, on lands adjacent to the western side of Site 3-S, on lands adjacent to the north and west sides of Site 10-C, lands to the south of Site 10-C, and lands adjacent to the eastern side of Site 15-S;
 - Protocol-level blunt-nosed leopard lizard surveys (12 days of surveys between April 15 and July 15 and five survey days between August 15 and September 15) conducted within suitable habitat (Figures 3-7A-B). Surveys were conducted on lands adjacent (within 500 feet) to the north and west sides of Site 1-C, on the lands adjacent to the east of Site 2-S to the lands adjacent to the west side of Site 3-S, on the lands adjacent to the east side of Site 15-S, on Site 3-C2, within the 83.25 acres of native habitat occurring on Site 9-C, on the lands adjacent to the west of Site 9-C, and on lands adjacent to the north and west sides of Site 10-C, and on lands south of Site 10-C;
 - Protocol-level San Joaquin kit fox surveys consisting of searches for potential dens, night spotlighting around each site, and monitoring track stations equipped with cameras with infra-red and motion sensitive triggers (generally, with one station established in each corner and the center of each site) (Figure 3-8); and
 - Raptor nest surveys consisting of identifying any stands of trees and manmade structures (such as transmission towers) that would provide suitable nesting habitat for raptors, and recording any raptors or potential raptor nests within all Solar Sites, within all Conservation Sites, and within 0.5 miles of the Permit Area.

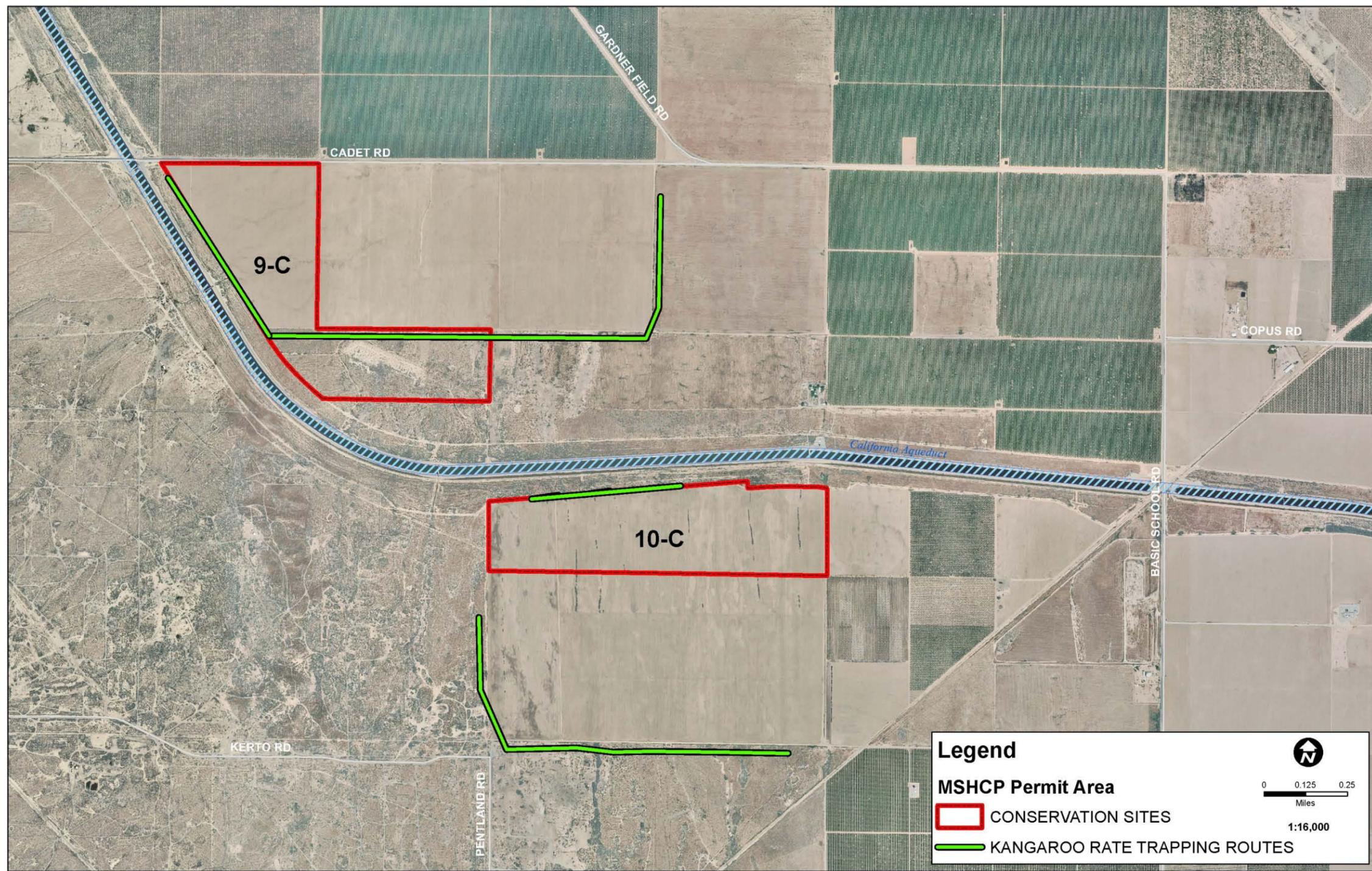


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SMALL MAMMAL TRAPPING LINES,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 – 6A

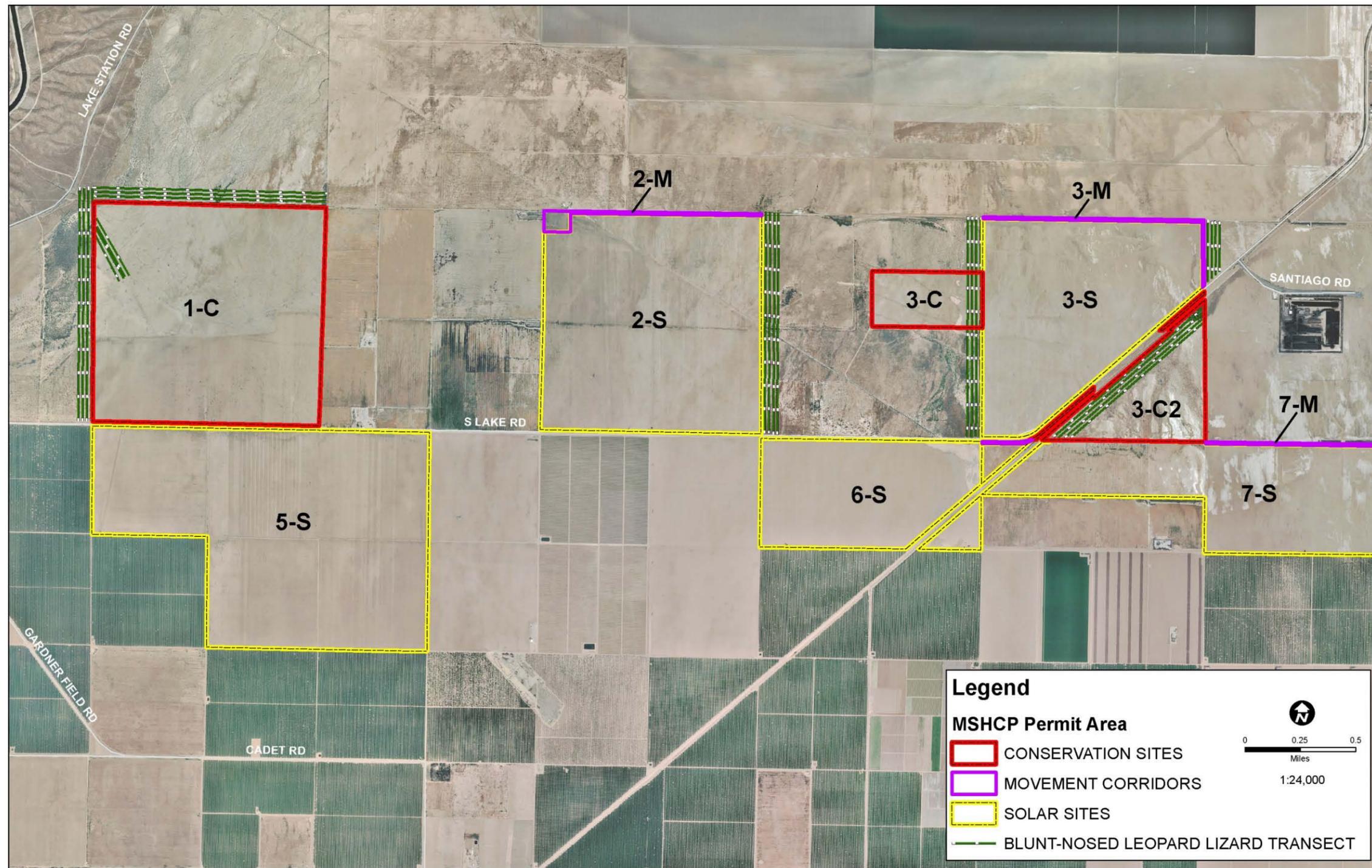


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SMALL MAMMAL TRAPPING LINES,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 6B

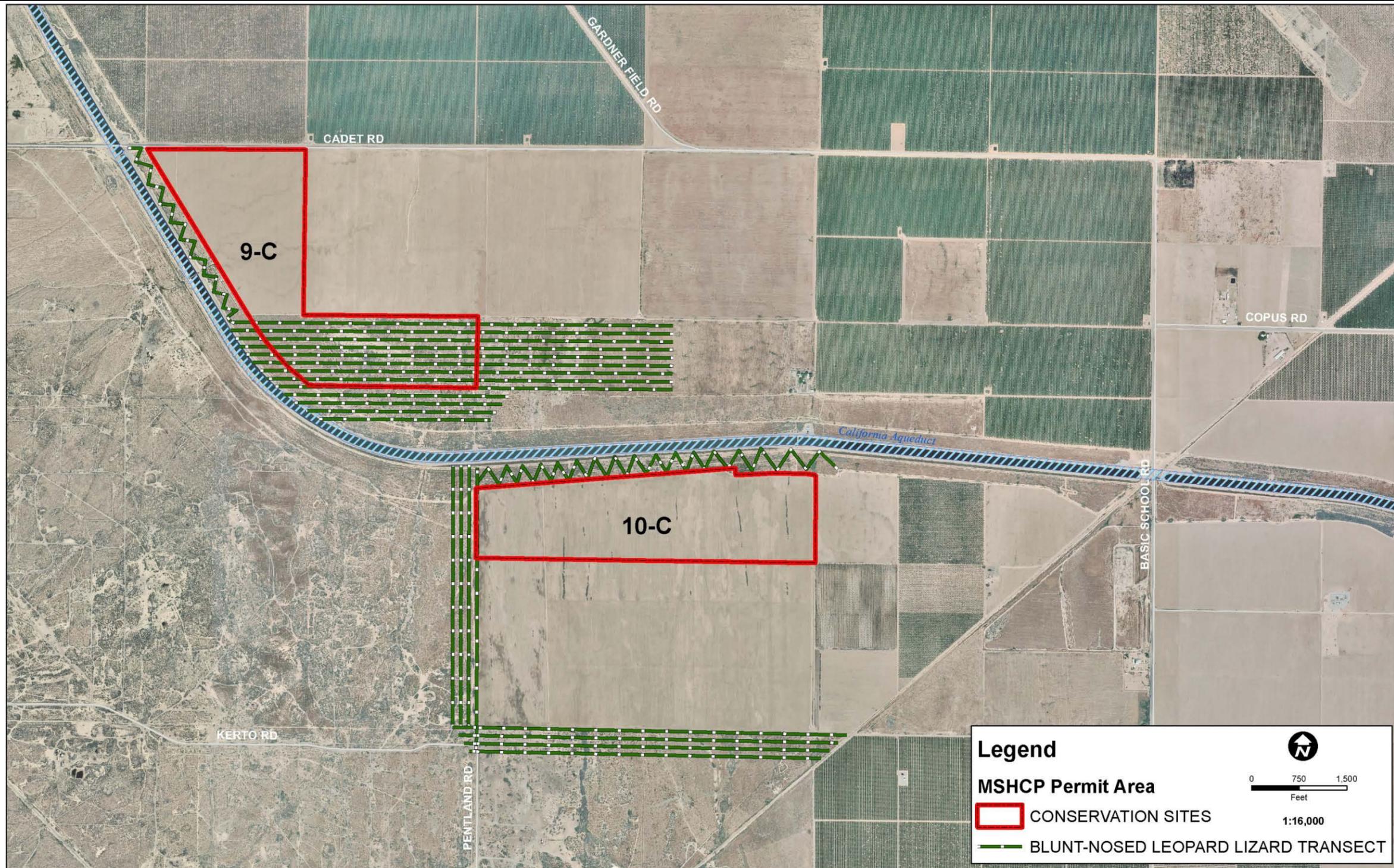


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BLUNT-NOSED LEOPARD LIZARD TRANSECT,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 - 7A

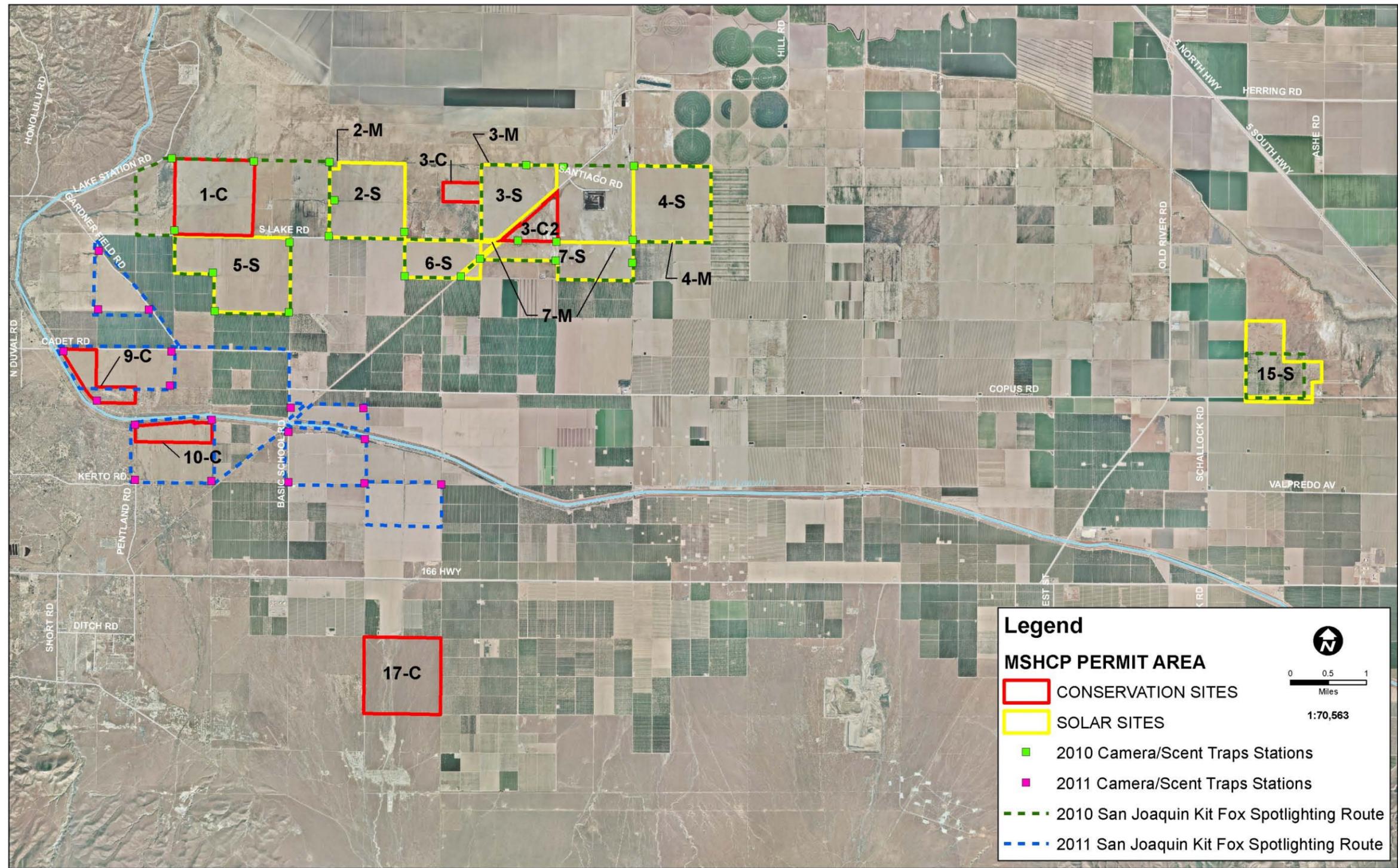


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BLUNT-NOSED LEOPARD LIZARD TRANSECT,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 – 7B



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SAN JOAQUIN KIT FOX SPOTLIGHTING,
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3 – 8

The following site-by-site descriptions of the Permit Area include information on land use, sensitive natural communities, general vegetation occurrence, and general and special status plant and wildlife species occurrence.

Solar Sites (3,798.2 acres)

The Solar Sites (described in Section 2.2, illustrated on Figure 1-2), including the Movement Corridors, formerly supported agricultural uses; these sites encompass 3,798.2 acres. Due to the lack of available water, the land owners ceased agriculture production more than 8 years ago; however, the land has been kept in a farm-ready condition by repeated disking to control weeds. The Solar Sites are currently not fenced or actively improved.

Site 2-S (628.8 acres)

The site has been disked for weed control on a biannual basis, except for the sides of an earthen berm located along the northern edge of the site. The site is mostly bare ground with occasional weedy annual plants that include salt heliotrope (*Heliotropium curassavicum*), tamarisk, red brome (*Bromus madritensis rubens*), fiddleneck (*Amsinckia menziesii*), Mediterranean barley (*Hordeum murinum*), quailbush, and seepweed. A lone willow tree, which appears to be a black willow/weeping willow hybrid (*Salix gooddingii* and *S. babylonica*), exists near the electrical transmission lines in the southeast quarter of the site. Most of the annual plants occur along the earthen berm located at the north end of the site. Scattered seepweed shrubs are on the sides of the berm along the northern portion of the project site, but these scattered shrubs do not comprise a functional Valley Sink Scrub community. The surrounding lands consist of vineyards, an alfalfa (*Medicago sativa*) field, and disked fields. To the east of this site is native Saltbush Scrub habitat, which has had past disturbance by disking. This area is vegetated with disturbed chenopod scrubland, seepweed, Allscale saltbush, Mediterranean grass (*Schismus arabicus*), red brome, fiddleneck, alkali goldenbush (*Isocoma acradenia*) and a few large tamarisks.

Site 2-S was likely to have been historically vegetated with a matrix of Valley Saltbush Scrub and Alkali Sink Scrub vegetation communities. However, the site is not currently vegetated and is managed by repeated disking, which has eliminated all but the occasional plant. There are no historical records of special status plant or wildlife species occurring on the site (See Figures 3-5A-D), and habitat that would support special status species does not occur (Quad Knopf 2010c). Similarly, due to the high level of disturbance, it is unlikely but possible that special status species including heartscale (*Atriplex cordulata*), Lost Hills crown scale (*Atriplex coronata* var. *vallicola*), recurved larkspur (*Delphinium recurvatum*), Kern mallow (*Eremalche kernensis*), Hoover's eriastrum (*Eriastrum hooveri*), Tejon poppy (*Eschscholzia lemmonii* ssp. *Kernensis*), San Joaquin woollythreads (*Monolopia congdonii*), and/or oil neststraw (*Stylocline citroleum*) might occur within native saltbush scrub habitat that exists on adjacent lands to the east of Site 2-S.

Quad Knopf found no historic records indicating the occurrence of sensitive wildlife species on the project site (See Figures 3-5A-D) and no evidence could be found that Covered Species occupy this site (Table 3-9) (Appendix B). However, the San Joaquin kit fox and western burrowing owl may occasionally make forays onto and across the project site for foraging or movement purposes. Blunt-nosed leopard lizards, western burrowing owls, and Tipton kangaroo

rats were observed on adjacent land to the east of Site 2-S (Appendix B). The Tipton kangaroo rat and the blunt-nosed leopard lizard may forage onto Site 2-S and thus be subject to impacts from project construction, operations and maintenance, and decommissioning. To minimize impacts, barrier fencing (See Figure 2-4) will be installed along the edges of this site where these species occur or may occur, thus reducing the potential for take. Several dens located on adjacent lands are of the size and configuration that would qualify as potential San Joaquin kit fox and American badger dens, although diagnostic sign of these species was not present. Other special status species (e.g., western mastiff bat, white-tailed kite) may overfly the project site from time to time.

**Table 3-9
Existing Solar Site Conditions and Presence of Covered Species,
Maricopa Sun Solar Complex**

Site No.	Area (Acres)	Site Condition/Vegetation	Presence of Covered Species*
2-S	628.8	Fallow farmland, actively disked for weed control, minimal vegetation present	None present, but SJKF and WEBO may be transients; BNLL, TKR, and WEBO known to occur nearby
3-S	460.4	Fallow farmland, actively disked for weed control, minimal vegetation present; NWI mapped freshwater emergent wetlands; field surveys determined that the area lacks hydric soils or wetland vegetation	WEBO was sighted on this site, SJKF may be transients; BNLL, TKR, and WEBO known to occur nearby
4-S	652.5	Fallow farmland, actively disked for weed control, no vegetation present; a ponding basin is located on lands off site, adjacent to the southwest corner of this site	None present; SJKF and WEBO may be transients
5-S	797.2	Fallow farmland, actively disked for weed control, minimal vegetation present	None present; SJKF and WEBO may be transients
6-S	304.2	Fallow farmland, actively disked for weed control, minimal vegetation present	WEBO observed on site; SJKF may occur as transient; TKR and BNLL not present
7-S	471.6	Fallow farmland, actively disked for weed control, minimal vegetation present; NWI mapped emergent wetlands in the north central portion no longer present; a small (3.88-acre) ponding basin is present, off site, at the south corner	WEBO observed on site; SJKF may occur as transient; TKR and BNLL not present on site, but present on adjacent lands to the north; Covered Species may be present within existing easements, but no evidence of presence was obtained and those areas are not within the Solar Development Footprint
15-S	483.6	Fallow farmland, actively disked for weed control, minimal vegetation present; several NWI mapped wetlands are no longer present due to frequent disking	None present; WEBO, SJKF observed on adjacent lands and are expected to be present as transients on the site; TKR may also occur on adjacent lands.

* SJKF = San Joaquin kit fox; WEBO = western burrowing owl; BNLL = blunt-nosed leopard lizard; and TKR = Tipton kangaroo rat.

Site 3-S (460.4 acres)

Site 3-S has been disked for weed control on a biannual basis, except for an irrigation ditch that is bounded on both sides by dirt roads and that is located to the north of the disked field. The ditch and roads are maintained to control weeds, but weedy species are present at a greater

frequency than on the disked portions of this site. The site is sparsely vegetated with weedy annual plant species (especially along the irrigation ditch), including London rocket (*Sisymbrium irio*), five-hook bassia, black mustard (*Brassica nigra*), seepweed, Russian thistle (*Salsola tragus*), Mediterranean grass, saltgrass (*Distichlis spicata*), tamarisk, quailbush, annual weedy chenopods, and annual sunflower. The adjacent land consists of disked fields, a fallow field with a small patch of Valley Sink Scrub, which is highly degraded by disking, native habitat with an expanse of Chenopod Scrub habitat, and ponding basins that are vegetated with tamarisk, seepweed, saltbush, and scattered iodine bush (*Allenrolfea occidentalis*).

Quad Knopf found no historical records indicating the occurrence of special status species on Site 3-S (See Figures 3-5A-D). No sensitive vegetation communities occur on the site and no special status species of plants were observed on the site. The disked portion of the site does not contain habitat that would support special status species (Quad Knopf 2010c). The irrigation ditch at the north end of the site is maintained (by scraping and perhaps by the use of herbicides) at a lesser frequency than the disked portions of the site, and may be more suitable to support special status plant species. Even though no special status plants were observed in this area and the habitat is of poor quality, this area might contain special status plants. However, this area is not within the Solar Development Footprint and is within an area that will be conserved as a Movement Corridor. There is also a potential that special status plant species may be present in adjacent native habitat that occurs to the west of the Site 3-S. Special status species potentially occurring in this adjacent habitat include heartscale, Lost Hills crowscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw.

Based on a search of the CNDDDB database, much of Site 3-S was once occupied by Tipton kangaroo rats (see Figures 3-5A-D). However, the only Covered Species observed on the site was one western burrowing owl that was perched on the ground; no burrow was present (Table 3-9). The San Joaquin kit fox was not observed on the site, but may occasionally make forays onto and across the site. Covered Species observed on adjacent lands include western burrowing owl, blunt-nosed leopard lizard, and Tipton kangaroo rat. The Tipton kangaroo rat may also occur along the berms of a canal that is located within a Movement Corridor along the north end of the site. Although trapping was not conducted at this location and there are few burrows present, an unidentified kangaroo rat was observed along this canal (Appendix B). The Tipton kangaroo rat and the blunt-nosed leopard lizard may forage onto Site 3-S, and thus be subject to impacts from project construction, operations and maintenance, and decommissioning. To minimize impacts, barrier fencing will be installed along the edges of the site where these species occurs or may occur (see Figure 2-4), thus reducing the potential for take. Western burrowing owl dens and California horned lizard scat were observed on adjacent lands. Similarly, other special status species (e.g., western mastiff bat, white-tailed kite, and northern harrier) may overfly the project site from time to time.

Site 4-S (652.5 acres)

The entirety of Site 4-S has been disked on a biannual basis for weed control and there is no topographic relief. Along the margins are a few weedy species, such as amaranth (*Amaranthus* sp.), but the site is otherwise devoid of vegetation. The adjacent land consists of row crop fields (onions and carrots), disked fields, fallow fields, and alfalfa fields. A ponding basin vegetated with thick quailbush and some tamarisk, and a canal vegetated with cottonwood, tamarisk,

mulefat (*Baccharis salicifolia*) and five-hook bassia are adjacent to the southwest corner of the site.

Quad Knopf found no historical records indicating the occurrence of sensitive natural communities or special status plant species on Site 4-S (see Figures 3-5A-D), but it is likely that this site was once vegetated with Valley Saltbush Scrub, a sensitive natural community. Repeated disking has eliminated all native vegetation from the site, and there is no habitat present that would support special status plant species. Similarly, intensive agricultural activities occurring on adjacent lands have eliminated habitat that would support special status plant species from those areas, except perhaps on lands adjacent to the southwest corner of Site 4-S, where there is a remnant habitat patch.

Quad Knopf found no historic records indicating the occurrence of sensitive wildlife species on the site (see Figures 3-5A-D) and no special status wildlife species were observed on the site. San Joaquin kit fox and American badger may occasionally make forays onto and across the site, and other special status wildlife species (e.g., western mastiff bat, northern harrier, white-tailed kite) may overfly the project site from time to time. Northern harrier and a pair of Swainson's hawks were observed on adjacent lands.

Site 5-S (797.2 acres)

Site 5-S has been disked on a biannual basis for weed control and is all bare ground, except for an occasional weedy annual plant or plants that occur individually or in small isolated patches. Plants observed on this site included Bermuda grass (*Cynodon dactylon*), orchard bindweed (*Convolvulus arvensis*), Johnsongrass (*Sorghum halepense*), five-hook bassia, London rocket, Russian thistle, and lamb's quarters (*Chenopodium album*). Annual weedy atriplex occurs on some portions of this site, particularly along the margins. Some scattered patches of jimsonweed (*Datura wrightii*), prickly lettuce (*Lactuca serriola*), Mediterranean barley, and alkali mallow (*Malvella leprosa*) also were present. The adjacent lands are disked fields containing almond (*Prunus dulcis*) orchards, and an alfalfa field.

Quad Knopf found no historical records indicating the occurrence of special status species on Site 5-S (see Figures 3-5A-D), and no sensitive vegetation communities or special status plants were observed. The site does not contain habitat that is suitable to support special status plant species. Lands to the south, west, and east are cultivated and do not support special status species. Land to the north of Site 5-S, and separated from Site 5-S by South Lake Road, supports a variety of special status species (see descriptions of lands adjacent to Site 1-C).

Quad Knopf found historical records indicating the existence of the Tipton kangaroo rat on the northeast portion of Site 5-S or on lands adjacent to the northern border of the site (see Figures 3-5A-D). No Covered Species were observed on the site (Table 3-9). Tipton kangaroo rats are currently absent from the site, having been extirpated by the conversion of habitat through regular disking. The San Joaquin kit fox and western burrowing owl could be transients and occur on the site from time to time. The only special status species observed on this site was a white-tailed kite that was overflying the site (Table 3-9). Western burrowing owls were observed on the adjacent lands to the north. Other special status species (e.g., western mastiff bat and northern harrier) may overfly the project site from time to time.

Site 6-S (304.2 acres)

Site 6-S has been repeatedly disked for weed control and is bare ground with an occasional weedy plant, except for a small strip of land occurring within an existing railroad easement (see Appendix B). The vegetation existing in the railroad easement includes thick growth of London rocket, scattered Russian thistle, five-hook bassia, and annual atriplex (probably *Atriplex argentea*). A canal is present off site, along the southeastern border that contains some quailbush, annual sunflower, and some scattered tamarisk. Other lands adjacent to Site 6-S are disked fields, orchards, and the native chenopod scrub habitat that occurs between sites 2-S and 3-S.

Quad Knopf found no historic records indicating the occurrence of special status species on the Site 6-S (see Figures 3-5A-D), and no sensitive vegetation communities or special status species plants were observed on the site. No habitat that would support special status plant species occurs on the portion of this site that is within the Solar Development Footprint; however, some habitat is present within the existing railroad easement that could support special status plant species. Special status species might occur to the north on adjacent lands that are vegetated with disturbed saltbush scrub. Special status plant species potentially occurring on those adjacent lands include heartscale, Lost Hills crowscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw.

Quad Knopf found no historic records indicating the occurrence of sensitive wildlife species on the site (see Figures 3-5A-D). The only Covered Species observed was a western burrowing owl; however, no burrow for this western burrowing owl was found, and it was therefore assumed to be foraging on the site and not a resident (see Appendix B and Table 3-9). The San Joaquin kit fox may occasionally make forays onto and across Site 6-S. Other special status species (e.g., western mastiff bat, white-tailed kite) may overfly the project site from time to time. On adjacent lands, western burrowing owl and northern harrier were recorded. The Tipton kangaroo rat, western burrowing owl, blunt-nosed leopard lizard, San Joaquin kit fox, loggerhead shrike, American badger, and California horned lizard could possibly occur north of the site in native chenopod scrub habitat. The site is isolated from this native habitat by South Lake Road, but the Tipton kangaroo rat and blunt-nosed leopard lizard could forage onto the site, and thus be subject to impacts from project construction, operations and maintenance, and decommissioning. To minimize impacts, barrier fencing will be installed along the edges of the site where these species occur or may occur (see Figure 2-4), thus reducing the potential for take.

Site 7-S (471.6 acres)

The entirety of this site has been disked on a biannual basis for weed control, except for a small strip of land occurring within an existing railroad easement and within an easement along South Lake Road. These areas are not within the Solar Development Footprint. The site is mostly bare ground, with some scattered patches of weedy species that recover after diskings, including five-hook bassia, yarrow (*Achillea millefolium*), annual sunflower, tamarisk, and some trunks of burned black willows. These plants are common in the existing easements. The site is surrounded by disked lands, orchards, and a fallow field that is vegetated with weedy species and tamarisk.

Quad Knopf found no historic records indicating the occurrence of special status plant species on the site (see Figures 3-5A-D), and no sensitive vegetation communities were present on the site. The site does not contain habitat that would support special status plants, except within existing easements that are not within the Solar Development Footprint. Lands surrounding this site are in active agriculture or are managed by repeated disking. It is unlikely that special status plant species occur on these adjacent lands.

Quad Knopf found no historic records indicating the occurrence of sensitive wildlife species on Site 7-S (see Figures 3-5A-D). Biologists made two observations of the western burrowing owl on the site, but no other observations of Covered Species or other special status wildlife species or their diagnostic signs (Table 3-9). The San Joaquin kit fox may occasionally make forays onto and across the project site. Other special status wildlife species (e.g., western mastiff bat, white-tailed kite) may occasionally overfly the project site. The habitat located within the railroad easement and within the easement along South Lake Road has the potential to harbor nesting loggerhead shrikes (*Lanius ludovicianus*), and other migratory birds and raptors. It is unlikely that the blunt-nosed leopard lizard or Tipton kangaroo rat occur in this area, because the dense, weedy understory is not a desirable habitat for these species. Native lands within Section 22, northwest of Site 7-S, are known to host the western burrowing owl, Tipton kangaroo rat, blunt-nosed leopard lizard, and California horned lizard; and may support San Joaquin kit fox, American badger, or loggerhead shrikes. Site 7-S is isolated from this native habitat by South Lake Road, but Tipton kangaroo rat and blunt-nosed leopard lizard could forage onto the site, and thus be subject to impacts from project construction, operations and maintenance, and decommissioning. To minimize impacts, barrier fencing will be installed along the edges of the site where these species occurs or may occur (see Figure 2-4), thus reducing the potential for take.

Site 15-S (483.6 acres)

Site 15-S is entirely disked for weed control and is devoid of vegetation. Disturbed Valley Sink Scrub, a sensitive vegetative community, occurs to the northeast of Site 15-S. Other surrounding lands are disked fields, alfalfa fields, asparagus fields, a vineyard, and a fallow field that is mostly vegetated with London rocket. A ponding basin that contains tamarisk, red willow (*Salix laevigata*), black willow, mulefat, yarrow, quailbush, seepweed, common cattails, and Mexican milkweed (*Asclepias fascicularis*) is located north of this site.

There is a historic record of Comanche Point layia (*Layia leucopappa*) occurring in the vicinity the site (see Figures 3-5A-D). The accuracy of that recorded observation is a one-mile radius, and although the record overlaps the site, it is not known whether the species occurred within Site 15-S. Currently no sensitive vegetation communities or special status plant species are present on the site because of the repeated disking that routinely occurs, and there is no habitat that would support Comanche Point layia. Disturbed Valley Sink Scrub, a sensitive vegetative community, occurs to the northeast and east of Site 15-S. This was likely the dominant natural vegetation community occurring on Site 15-S prior to the site's conversion to agricultural use. The potential exists for Comanche Point layia to occur on adjacent lands north and east of the site.

A review of CNDDDB records indicate that Site 15-S was once occupied by San Joaquin kit fox (see Figures 3-5A-D). Quad Knopf found no evidence that any Covered Species occur on the site, but a San Joaquin kit fox and five western burrowing owls were observed to the east of the site on adjacent lands. These Covered Species could occur on the site as transients. Although the site itself has little potential to harbor sensitive biological resources, except as transients or foragers, the Valley Sink Scrub habitat to the north and east of the site has the potential to support the blunt-nosed leopard lizard, Tipton kangaroo rat, Nelson's antelope squirrel, San Joaquin kit fox, and western burrowing owl, which are known to occur on those lands. The Tipton kangaroo rat, Nelson's antelope squirrel, and blunt-nosed leopard lizard could forage onto the site, and thus be subject to impacts from project construction, operations and maintenance, and decommissioning. To minimize impacts, barrier fencing will be installed along the edges of the site where these species occur or may occur (see Figure 2-4), thus reducing the potential for take.

Conservation Areas

Although the Movement Corridors are technically included along with the acreage described within the Solar Sites, the Movement Corridors will be part of the areas managed as conservation areas, and thus are discussed in this section. This discussion includes Movement Corridors that are present along the northern border of site 2-S (2-M), along the northern and eastern borders of site 3-S (3-M), along the southern border of site 4-S (4-M), and along the northern border of 7-S (7-MW and 7-ME). This section also describes the conditions present on and adjacent to each of the six Conservation Sites (1-C, 3-C, 3-C2, 9-C, 10-C, and 17-C).

Existing conditions on lands that will be set aside for the conservation of species are variable, consisting of lands that are currently disked, and lands that contain native habitat and are known to currently support Covered Species. Information on current conditions of these lands was summarized from the studies conducted on the Maricopa Sun Solar Complex sites (Quad Knopf 2010a, 2010b, 2010c, 2010d, 2012) (Appendix G), and from supplemental studies for the Maricopa West Solar Project (Quad Knopf 2010e), which are summarized in Appendix B.

Movement Corridors

The Project includes four Movement Corridors totaling 33.8 acres. The Movement Corridors are distinct from the Solar Development Footprint and will be avoided by construction activities. During development of solar facilities, the Movement Corridors will be managed for the benefit of Covered Species to facilitate their movement in and around the Solar Sites. Movement Corridors will be protected under the same conservation easement placed on adjoining Solar Sites at the point building permits are acquired for those Solar Sites. Movement Corridors will be incorporated into the conservation strategy undertaken on the adjoining Solar Site, and protected and managed for Covered Species in perpetuity once the solar project is decommissioned.

MOVEMENT CORRIDOR 2-M (12.5 ACRES)

Movement Corridor 2-M is located along the northern border of Site 2-S. The corridor includes an earthen berm and an existing wetland. Much of this corridor is bare ground and is in a disked state, but some scattered vegetation exists along the earthen berm. No sensitive vegetation

communities occur within this corridor (aside from the disked wetland area), and it is unlikely that this area contains special status plant species due to the routine disking and other maintenance activities. Covered Species were not observed within this corridor. Some burrows exist along the earthen berm and the Tipton kangaroo rat might exist in very low numbers within this corridor.

MOVEMENT CORRIDOR 3-M (7.8 ACRES)

Movement Corridor 3-M is located along the northern and eastern borders of Site 3-S. The portion of the corridor along the northern border contains an irrigation canal. Portions of the northern corridor and the entire eastern corridor are managed by routine disking. The canal portion of the northern corridor is maintained by removing weedy plant species, but at a frequency that is somewhat less than the disked areas. Along the canal, within the corridor, is a dirt road that is not vegetated, other than with scattered weedy species (e.g., five-hook bassia). Consequently, the disked portions are barren ground with scattered plants invading between periods of disking, whereas the irrigation canal is more heavily vegetated. No sensitive vegetation communities occur within this corridor, and it is unlikely that this area contains special status plant species due to the routine disking and other maintenance activities. Covered Species were not observed within this corridor. However, some small mammal burrows exist along the canal, an unidentified kangaroo rat was observed along the road that follows the canal, and the Tipton kangaroo rat might exist in very low numbers within this corridor.

MOVEMENT CORRIDOR 4-M (6.1 ACRES)

Movement Corridor 4-M is located along the southern border of Site S-4. It consists entirely of bare ground that has been subject to repeated disking. It does not contain habitat capable of supporting Covered Species or special status plant species.

MOVEMENT CORRIDOR 7-M (7.4 ACRES)

This corridor consists of two separate areas: one area (7-MW) that follows an east-west easement along South Lake Road, connecting with the railroad easement on its east end; and another area (7-ME) along the northern border of Site 7-S that connects Site 3-C2 to Movement Corridor 4-M. Both of these areas consist of disked lands that contain no vegetation other than an occasional weedy plant. No Covered Species were observed and no special status plants or special status wildlife species occur on these lands. Lands adjacent to these corridors (i.e., the easement along South Lake Road, the railroad easement, and site 3-C2) are known to contain habitat that might support Covered Species.

Conservation Sites

The six Conservation Sites encompass 1,894.4 acres (See Figure 1-2; Table 2-1). The Conservation Sites will be placed into a permanent Conservation Easement and managed in perpetuity for the benefit of Covered Species and other special status species. Enhancements, management actions and goals, and long-term monitoring of these lands are described in Chapter 5. The description of current conditions on each Conservation Site and justifications for adopting these sites as conservation lands are presented in Appendix G. Site conditions are summarized below.

SITE 1-C (656.6 ACRES)

This site is regularly disked for weed control and the majority of the site contains no vegetation, but there is an old levee structure in the northwest corner of the site that is not disked. That structure is vegetated with valley saltbush, quailbush, and *Isocoma*. The site historically contained freshwater shrub wetlands (USFWS 2012). The area lacks hydric soils or wetland vegetation, but there are some remnant characteristics that indicate past water flows across the site from southwest to northeast. Those areas that exhibit signs of flow have been determined by the USACE to be federally regulated waters that are hydrologically connected to a Traditional Navigable Water (per communication, Ramon Aberasturi, USACE).

The site is sparsely vegetated with weedy plant species, including fiddleneck, orchard bindweed, Bermuda grass, London rocket, tamarisk and quailbush. There are scattered Allscale saltbush shrubs and seepweed along the levee and the basins associated with the levee. There are native Valley Sink Scrub and saltbush scrub habitats present on the adjacent land, to the north and west of Site 1-C, which are known to contain sensitive species. The other surrounding land use includes alfalfa production, orchards, and disked fields.

Quad Knopf found no historical records indicating the occurrence of special-status plant species on Site 1-C (see Figures 3-5A-D), but it is likely that the site was once vegetated with saltbush scrub, which is a sensitive vegetation community. Past disking has eliminated all but a small portion of the saltbush scrub habitat type, which is now restricted to the northeast corner. That area will be enhanced as described in Section 5, *Conservation Program*. No special status plants or habitat that would support special status plants are present on the site. Native Valley Sink Scrub and saltbush scrub habitat is present on the adjacent land to the north and west of the project site. Special status plant species that might occur in these adjacent lands include heartscale, Lost Hills crowscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw.

There are historical records of the Tipton kangaroo rat existing along the southern portion of the site (see Figures 3-5A-D). The only Covered Species observed on the site was the Tipton kangaroo rat (Quad Knopf 2010a) (Table 3-10), which occur in the northeast corner of the site, which contains non-disked habitat. A very narrow strip at the margins of South Lake Road, where the existing road easement is not disked, was trapped for the Tipton kangaroo rat, but none were captured in that area. The habitat occurring within the northwest corner of the site provides suitable habitat not only for the Tipton kangaroo rat but also for the San Joaquin pocket mouse (*Perognathus inornatus inornatus*), Tulare grasshopper mouse (*Onychomys torridus tularensis*), and other special status species. Western burrowing owl, Nelson's antelope squirrels, and a San Joaquin kit fox skull were found in adjacent habitats. Observations of northern harrier and diagnostic sign of American badger were observed in adjacent native habitat. These species could forage on or otherwise occur as transient visitors to the site. Other special status species (e.g., western mastiff bat and white-tailed kite) may overfly the project site from time to time. Other special status species that might also occur in the adjacent lands include LeConte's thrasher (*Toxostoma lecontei*), and blunt-nosed leopard lizard.

Table 3-10
Existing Maricopa Sun Solar Complex Conservation Sites Conditions
and Presence of Covered Species

Site No.	Area (Acres)	Site Condition/Vegetation	Presence of Covered Species*
1-C	656.6	Fallow farmland, actively disked for weed control, little vegetation except in the northwest corner along an existing levee; mapped as NWI freshwater shrub wetlands; however, field surveys determined that the area lacks hydric soils or wetland vegetation, but USACE determines that federal Waters are present	TKR observed on site. SJKF, NAS, and WEBO observed on adjacent lands and may be transients on site. BNLL may also be present on adjacent lands, but protocol surveys failed to locate them
3-C	80.4	Fallow farmland, actively disked for weed control, no vegetation	No Covered Species observed. Adjacent lands contain WEBO, TKR, BNLL, and possibly NAS and SJKF
3-C2	152.9	Fallow farmland which was managed for weed control in past years, but disking has not occurred in recent years; the site has partially recovered, supporting annual grasses, seepweed, and some scattered saltbush and tamarisk	WEBO observed. No TKR captured despite extensive trapping. SJKF may be a transient
9-C	180.6	83.25 acres vegetated with Atriplex scrub, the remainder is disked with no vegetation	WEBO, NAS, and TKR are known to occur on the 83.25 acre portion. BNLL and SJKF might also be present. WEBO and SJKF may be a transient on the remaining portion of this site
10-C	176.2	Fallow farmland, actively disked for weed control, no vegetation	No Covered Species were observed. The SJKF, WEBO, NAS, TKR, and BNLL are all known to occur nearby
17-C	647.7	Relatively natural state, consisting of saltbush and goldenbush dominated scrublands	No Covered Species observed. Two special status species observed on site. WEBO, SJKF, BNLL, and NAS are known from nearby. The site is located within the "Core" area of SJKF

*WEBO = western burrowing owl, SJKF = San Joaquin kit fox, NAS = Nelson's antelope squirrel. TKR = Tipton kangaroo rat, BNLL = blunt-nosed leopard lizard.

SITE 3-C (80.4 ACRES)

Site 3-C is located along the western edge of Site 3-S. It has been disked on a biannual basis and is devoid of vegetation. Site 3-C formerly supported agricultural land uses and has been kept in a farm-ready condition by repeated disking and is surrounded on three sides by native saltbush scrub habitat. This site does not contain habitat that is suitable to support special status plant species and none were observed during surveys. No Covered Species were observed on this site. Lands adjacent to this site are known to contain the western burrowing owl, blunt-nosed leopard lizard, and Tipton kangaroo rat. These species, along with the San Joaquin kit fox, could be present as transients and could become established on the site once disking ceases. Other special status species (e.g., western mastiff bat, white-tailed kite, and northern harrier) may overfly the project site from time to time.

SITE 3-C2 (152.9 ACRES)

Site 3-C2 is vegetated with a matrix of introduced grasses, seepweed, and some scattered saltbush scrub and tamarisk. The entirety of this site had been disked for weed control on a biannual basis, but it has not been disked in a number of years. The site is sparsely vegetated with weedy annual plant species, including London rocket, five-hook bassia, black mustard, seepweed, Russian thistle, Mediterranean grass, saltgrass, tamarisk, quailbush, annual weedy chenopods, and annual sunflower. London rocket is very dense on portions of this site, and other areas have a preponderance of bare ground. The adjacent land consists of disked fields to the east, and saltbush scrub to the south and west. To the north is a matrix of disturbed saltbush scrub and alkali sink habitat.

Quad Knopf found no historical records indicating the occurrence of special status species on the site (see Figures 3-5A-D). No sensitive vegetation communities or special status plant species were present on the site (Quad Knopf 2010a). It is reasonable to conclude that there is an absence of special status plant species because of the regular disking, but there is the potential that they could become established as recovery of this site proceeds. The potential exists that special status plant species may be present in adjacent native habitat that occurs to the north, south and west of the site. Special status species potentially occurring in this adjacent habitat include heartscale, Lost Hills crowscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw.

Based on a search of the CNDDDB database, much of this site was once occupied by Tipton kangaroo rats (see Figures 3-5A-D). This site is known to contain western burrowing owls and the habitat appears to be suitable to support the Tipton kangaroo rat, but none were captured on this site during trapping efforts (Quad Knopf 2010a). Although there is no evidence to support a determination of their presence, the Tipton kangaroo rat, San Joaquin kit fox, and blunt-nosed leopard lizard could become established within this site. Special status species observed on adjacent lands include western burrowing owl, northern harrier, blunt-nosed leopard lizard, and Tipton kangaroo rat.

SITE 9-C (180.6 ACRES)

Site 9-C borders native habitat that occurs along the right-of-way of the California Aqueduct, which provides a viable movement corridor for a wide variety of special status species, including those species that will be covered by this MSHCP. The northernmost portion of Site 9-C has been disked on a biannual basis for weed control, and is nearly devoid of vegetation. The southernmost 83.25-acre portion of the site and areas to the south and west of Site 9-C are vegetated with Atriplex scrub habitat. These areas mostly contain Saltbush Scrub, a sensitive vegetative community, dominated by saltbush with sparse ground cover of fiddleneck and Mediterranean grass. Some disking, mounding of dirt, and other disturbances are present near the center of this patch of Saltbush Scrub habitat.

The land south of the southeast corner of Site 9-C consists of non-native grassland habitat that exhibits signs of previous sheep grazing (e.g., sheep pellets, tracks, and sheep carcass). A stubble

field along the east perimeter of Site 9-C contains a substantial amount of Russian thistle and some tamarisk. Cadet Road to the north of the site separates Site 9-C from almond orchards.

The southern 83.25-acre portion of Site 9-C is known to provide habitat for the Tipton kangaroo rat, Nelson's antelope squirrel, and western burrowing owl, and is likely to be used by the San Joaquin kit fox. The blunt-nosed leopard lizard might also be present in this site, although protocol-level surveys failed to verify its presence.

SITE 10-C (176.2 ACRES)

Site 10-C is repeatedly disked for weed control and it currently lacks vegetation. Irrigation standpipes and pumps are present within this site, indicating past agricultural use. The habitat adjacent to the south and west of Site 10-C is vegetated with Allscale saltbush. These areas are used for sheep grazing, which is particularly evident to the south of the site. The off-site area to the west and southwest is used for oil production, with numerous active and inactive oil wells present. The habitat adjacent to the north of the site, along the California Aqueduct right-of-way, is vegetated with saltbush scrub, tamarisk, and other shrub species. The California Aqueduct right-of-way is a known corridor for a variety of special status wildlife species. Along the east side of the project site are disked fields, divided by a middle section consisting of an almond orchard. To the east, beyond these disked fields, are almond and apricot orchards.

This site is not known to support Covered Species, although the San Joaquin kit fox and western burrowing owl may forage on the site or be present as transients. As is the case with Site 9-C, Site 10-C is contiguous with existing habitat along the California Aqueduct, and native habitat occurs to the west and south of the site. Because this site is close to existing habitat, it is likely that the site will recover and provide conservation benefits to Covered Species rather quickly, providing habitat for San Joaquin kit fox, western burrowing owl, Nelson's antelope squirrel, blunt-nosed leopard lizard, and Tipton kangaroo rat.

The historic geographic range of the Tipton kangaroo rat was limited to arid-land communities occupying the valley floor of the Tulare Basin (USFWS 2010). The spatial distribution extended from Lemoore and Hanford (Kings County) in the north; southeast along State Route 99 south to Arvin (Kern County); and then westward to the southern, eastern, and northern shores of the former Buena Vista Lake (Kern County); and then northward through the Antelope Plain along a line marked by Buttonwillow, Lost Hills (Kern County), Kettleman City (Kings County), and Westhaven (Fresno County; Service 1988:25609).

The current distribution is not well known or documented. The presence of Tipton kangaroo rats at sites south of Buena Vista Lake is not certain and several sites actually occupied by Tipton kangaroo rats at present are not characterized as being within the current distribution (USFWS 2010). Nonetheless, the general boundaries of the south and west portions of the range of this species is considered to coincide with the California Aqueduct (Williams 1986). This has been generally accepted by the biological community and holds true with some exceptions: it is not clear whether the Tipton kangaroo rat formerly or currently occurs in the Lokern Natural Area (USFWS 2010), and the Tipton kangaroo rat is a targeted species for protection in that area; and

there are multiple CNDDDB records of Tipton kangaroo rats located south of the California Aqueduct in the area adjacent to Site 10-C (CNDDDB 2013).

The habitat in the vicinity of Site 10-C, being saltbush scrub on the floor of the valley rather than on the alluvial plain of the coast or transverse range, is suitable for Tipton kangaroo rats. The morphology of individuals captured from this area is representative of both Tipton kangaroo rat and short-nosed kangaroo rat (*D. n. brevinasus*) characteristics, thus suggesting that this limited geographic area represents an intergrade zone for this species (Uptain, unpubl. Data). Although it would be reasonable to include Site 10-C as conservation habitat for the Tipton kangaroo rat, we have not done so because of the ongoing controversy of range boundaries and species identifications.

SITE 17-C (647.7 ACRES)

Site 17-C is in a relatively natural state, having never been actively farmed or tilled. Vegetation on the site is predominantly Chenopod Scrub, along with non-native grassland mosaic. Valley Saltbush Scrub, a CDFW sensitive natural community, is present over a large portion of the site (see Figures 3-5A-D). No other sensitive natural vegetative communities are present on the site or in the project vicinity. Two special status species were observed on the project site: vinegar weed, which is a CNPS list 1B plant, and the loggerhead shrike, which is on the CDFW watch list. No Covered Species were observed on the site, but there are historic records of the blunt-nosed leopard lizard, San Joaquin kit fox, and Nelson's antelope squirrel in the vicinity of this site, and the habitat on this site is suitable to support these species. The site does not occur within the range of the Tipton kangaroo rat. The American badger also occurs within the vicinity of the site (see Figures 3-5A-D). Suitable habitat exists on the site to support wildlife and several species are likely to be present (Quad Knopf 2009). The San Joaquin kit fox "core" habitat (USFWS 1983) occurs in the western portion of the site and the site is nearly contiguous with Windwolves Preserve, which provides an east-west linkage corridor for the species (Appendix H).

3.3 Covered Species

The species covered under the authority of this MSHCP are those species that are currently listed or are likely to become listed by the federal government within the project's life, and which may be subject to "take" as defined by the federal Endangered Species Act (Table 3-11). The definition of special status species, the criteria used to evaluate whether any particular species should be covered by the MSHCP, the final list of Covered Species, and the known occurrence and brief description of potential impacts to those species are presented in the sections below.

Species considered for coverage by this MSHCP include plants and animals that are legally protected under FESA, CESA, or other regulations; and species that are considered sufficiently rare by the scientific community to qualify for such listing, and include species that are:

- Listed or proposed for listing as threatened or endangered under the FESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants] and various notices in the Federal Register [FR] [proposed species]);

- Candidates for possible future listing as threatened or endangered under the FESA (66 FR 54808, October 2001);
- Listed or proposed for listing as threatened or endangered under FESA (50 CFE 17.11 [listed animals] and various notices in the FR [proposed species]); and
- Candidates for possible future listing as threatened or endangered under FESA (66 FR 54808, October 30, 2001).

3.3.1 COVERED SPECIES EVALUATION CRITERIA

To determine which species would be covered by the MSHCP, a list of species that occur or may occur in the Project area was compiled on the basis of information from the following resources:

- CNDDDB;
- CNPS's (2010) Electronic Inventory of Rare and Endangered Vascular Plants of California; and
- USFWS's federally-protected species list.

A list of 17 species was generated from these sources, and the potential occurrence of these species in the Permit Area and surrounding lands was evaluated based on the following criteria (Quad Knopf 2010c). For each species with potential to occur in the Project area (based upon their presence in the CNDDDB, occurrence in a list of species generated by topographic quadrangle by the USFWS, or suitable habitat occurring on and adjacent to the Project sites), information was gathered on its status, distribution, ecological information, threats, recovery actions, and conservation and management efforts. The following criteria were then applied to each species to determine whether it would be covered by this MSHCP. To be covered, a species had to meet the following criteria:

- **Status:** The species is protected under the FESA of 1973 or is likely to become listed within the permit term (35 years);
- **Range:** The species is historically known to occur within the project vicinity or will likely occur on or near the Solar Sites during project implementation;
- **Occurrence:** The species is known to occur in the project vicinity based on presence of credible evidence, or the species could potentially become present on the Solar Sites during the course of the project because of project-related habitat enhancements;
- **Habitat:** Suitable habitat for the species exists on the Solar Sites or on land adjacent to the Solar Sites; therefore, the species is potentially present or may become present during the course of the project; and
- **Potential for Take:** The species will likely be subject to take by covered activities.

A summary of the evaluation criteria and determinations of Covered Species are provided in Table 3-11.

3.3.2 COVERED SPECIES DESCRIPTIONS

This MSHCP covers five species that may be subject to take by Covered Activities (Table 3-12). Although not all of these species currently inhabit the Solar Development Footprint, they may inhabit adjoining properties or may become established on the Solar Development Footprint or Conservation Sites and Movement Corridors as disking ceases and habitat enhancement is implemented. A summary of the natural history of these species and the occurrence of Covered Species within the Permit Area is below. A complete analysis of the risk of take to these species is presented in Chapter 4, *Potential Biological Impacts and Levels of Take*, of this MSHCP. Natural history information for species not covered by this MSHCP and reasons for not pursuing coverage of certain species are presented in Appendix I.

San Joaquin Kit Fox (Vulpes macrotis mutica)

STATUS

The San Joaquin kit fox was listed as endangered by the U.S. Department of the Interior in 1967 and listed as threatened by the State of California in 1971 (USFWS 1983). A Recovery Plan for Upland Species of the San Joaquin Valley that outlines objectives to halt the decline of the species and increase population sizes was first completed in 1983 and then followed with a revised recovery strategy in 1998. Subsequent conservation actions have included acquisition of important habitat by the BLM, CDFW, California Energy Commission, Bureau of Reclamation, USFWS, the Center for Natural Lands Management, Windwolves Preserve, and the Nature Conservancy. Substantial long-term research has been conducted on populations in the Naval Petroleum Reserves and in the Carrizo Natural Area. The Endangered Species Recovery Program (ESRP) has been conducting a wide range of studies in recent years. These studies have provided important information on kit fox habitat requirements, behavior, demographics, and threats.

The goal of the recovery plan is to maintain a viable metapopulation of San Joaquin kit foxes on private and public lands throughout the species' range. This will include preservation of existing core and satellite populations. Areas where core populations are found include the Carrizo Plain Natural Area in San Luis Obispo County; the natural lands of western Kern County, including the Naval Petroleum Reserves, the Lokern Natural Area, and adjacent natural lands inhabited by San Joaquin kit foxes; and the Ciervo-Panoche Natural Area of western Fresno and eastern San Benito Counties. Camp Roberts and Fort Hunter Liggett also provide important habitat for San Joaquin kit foxes in the Salinas and Pajaro River watersheds. Additional lands in the San Joaquin Valley that have San Joaquin kit foxes or the potential to have them include refuges and other lands managed by the CDFW, California Department of Water Resources, Center for Natural Lands Management, Lemoore Naval Air Station, Bureau of Reclamation, USFWS, as well as various private lands in these areas.

**Table 3-11
Evaluation of Species for Coverage by the MSHCP**

Species	Status		Criteria for Likelihood of Occurrence			Potential for Take	Covered Species	Comments
	Federal	State	Range	Occurrence	Habitat			
Plants								
<i>Caulanthus californicus</i> (= <i>Stanfordia californica</i>) California jewel-flower	FE	CE, 1B.1	N	N	N	N	N	Suitable habitat to support this species does not occur within the Solar Sites or on adjacent lands. This species is thought to be extinct on the floor of the San Joaquin Valley.
<i>Eremalche kernensis</i> Kern mallow	FE	1B.1	Y	N	N	N	N	Suitable habitat that would support this species does not occur within the Solar Sites. Suitable habitat is located on some adjacent lands: to the north and northwest of Site 1-C, east of Site 2-S, and west of Site 3-S. These areas are not within the Solar Development Footprint and will be avoided by project activities. An analysis of potential project affects to this species is presented in Appendix I. There is suitable habitat on two conservation sites -- in the southern 83.25 acres of Site 9-C and on 17-C, although this species was not identified in those areas.
<i>Monolopia (Lembertia) condonii</i> San Joaquin woollythreads	FE	1B.2	N	N	N	N	N	Suitable habitat that would support this species does not occur within the Solar Sites. Suitable habitat is located on some adjacent lands: to the north and northwest of Site 1-C, east of Site 2-S, and west of Site 3-S. These areas are not within the Solar Development Footprint and will be avoided by project activities. An analysis of potential project affects to this species is presented in Appendix I. There is suitable habitat on two conservation sites -- in the southern 83.25 acres of Site 9-C and on 17-C. although this species was not identified in those areas.
Invertebrates								
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	FT	-	N	N	N	N	N	Suitable habitat for this species does not occur within the Permit Area.

**Table 3-11
Evaluation of Species for Coverage by the MSHCP (Continued)**

Species	Status		Criteria for Likelihood of Occurrence			Potential for Take	Covered Species	Comments
	Federal	State	Range	Occurrence	Habitat			
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	FT	-	N	N	N	N	N	Suitable habitat for this species does not occur within the Permit Area. The Project will not result in take of this species.
<i>Euproserpinus euterpe</i> Kern primrose sphinx moth	FT	-	N	N	N	N	N	The Permit Area is outside of the known range of this species and suitable habitat for this species does not exist in the Permit Area. The project will not result in take of this species.
Fishes								
<i>Hypomesus transpacificus</i> Delta smelt	FT	CT	N	N	N	N	N	The Permit Area is not within the known range of this species, suitable habitat to support this species does not occur within the Permit Area, and the project will not result in take of this species.
Amphibians								
<i>Rana draytonii</i> California red-legged frog	FT	-	N	N	N	N	N	The Permit Area is outside of the known range of this species and there is no habitat within the Permit Area that would support this species. The project will not result in take of this species.
Reptiles								
<i>Thamnophis gigas</i> giant garter snake	FT	CT	N	N	N	N	N	There is no habitat within the Permit Area that would support this species. The project will not result in take of this species.
<i>Gambelia sila</i> Blunt-nosed leopard lizard	FE	SE	Y	Y	Y	Y	Y	This species occurs on lands adjacent to some of the Solar Sites and Conservation Sites. The project will result in take of this species in the form of harm and harassment through the loss of habitat.
Birds								
<i>Athene cunicularia</i> western burrowing owl	-	CSC	Y	Y	Y	Y	Y	This species historically occurs within five miles of the Permit Area and was observed within the Permit Area. The Project could result in take of this species in the form of harm and harassment through loss of habitat.

**Table 3-11
Evaluation of Species for Coverage by the MSHCP (Continued)**

Species	Status		Criteria for Likelihood of Occurrence			Potential for Take	Covered Species	Comments
	Federal	State	Range	Occurrence	Habitat			
<i>Charadrius alexandrinus nivosus</i> western snowy plover	FT	-	N	N	N	N	N	This species would not occur within the Permit Area, except possibly as a seasonal transient. The Project will not result in take of this species.
<i>Gymnogyps californianus</i> California condor	FE	CE	N	N	N	N	N	This species does not historically occur within five miles of the Permit Area, and it was not observed in the Permit Area. The project will not result in take of this species.
Mammals								
<i>Dipodomys ingens</i> giant kangaroo rat	FE	CE	Y	N	N	N	N	This species historically occurs within five miles of the Permit Area, but neither this species nor its sign was observed within the Permit Area or adjacent land. Suitable habitat is not present within the Permit Area or on adjacent land. The project will not result in take of this species.
<i>Ammospermophilus nelsoni</i> <i>Nelson's antelope squirrel</i>	-	CT	Y	Y	Y	Y	Y	This species occurs in the Project vicinity, is currently listed as threatened by the State of California, and may become listed by the federal government during the life of the Project. The Project could result in take of this species in the form of harm and harassment through the loss of habitat.
<i>Dipodomys nitratoides nitratoides</i> Tipton kangaroo rat	FE	CE	Y	Y	Y	Y	Y	This species historically occurs within the Permit Area and on adjacent land, it is present on Sites 1-C and 9-C, and it is present on lands adjacent to sites 2-S and 3-S, and perhaps 15-S. The Project will result in take of this species.
<i>Sorex ornatus relictus</i> Buena Vista Lake shrew	FE	CSC	Y	N	N	N	N	This species historically occurs within five miles of the Permit Area. There is low quality habitat for this species occurring in ponding basins on lands adjacent to some Solar Sites, but no habitat capable of supporting this species occurs within the Solar Development Footprint. This species was not captured during trapping efforts. The Project will not result in take of this species.

**Table 3-11
Evaluation of Species for Coverage by the MSHCP (Continued)**

Species	Status		Criteria for Likelihood of Occurrence			Potential for Take	Covered Species	Comments
	Federal	State	Range	Occurrence	Habitat			
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	FE	CT	Y	Y	Y	Y	Y	This species occurs within the Project vicinity and likely historically occurred within the Permit Area. It is likely that this species is present on the Solar Sites as a transient forager, and would be subject to take during construction and operation of the project. Suitable habitat to support this species occurs on Conservation Sites 3-C2, 9-C, and 17-C.

* These species have the potential to become candidates for listing, threatened, or endangered by the United States Fish and Wildlife Service during the operational life of the Project and are therefore included as Covered Species.

Table 3-12
List of Species Proposed for Coverage, MSHCP

Common Name	Scientific Name	Status*		
		Federal	State	Other
Mammals				
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE	ST	-
Tipton kangaroo rat	<i>Dipodomys nitratooides nitratooides</i>	FE	SE	-
Nelson's antelope squirrel	<i>Ammospermophilus nelsoni</i>	-	ST	-
Birds				
Western burrowing owl	<i>Athene cunicularia</i>	-	CSSC	MBTA
Reptiles				
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE	SE	FPS

- Status designations are: CSC = California Special of Special Concern, FE = federally endangered, FPS = fully protected species, FT = federally threatened, SE = State endangered, ST = State threatened, MBTA = protected by the Migratory Bird Treaty Act.

LIFE HISTORY

San Joaquin kit fox currently only inhabits the San Joaquin Valley and surrounding foothills of the Coast Ranges, Sierra Nevada, and Tehachapi Mountains, and on the Carrizo and Elkhorn Plains. Much of the historic natural vegetative communities within the range of the San Joaquin kit fox has been eliminated and is now represented only by small, isolated and degraded remnants. Accordingly, San Joaquin kit foxes are now primarily confined to isolated parcels of natural lands in Kern, Tulare, Kings, Fresno, Madera, San Benito, Merced, Stanislaus, San Joaquin, Alameda, and Contra Costa counties.

San Joaquin kit foxes occur in a variety of habitats, including grassland, scrublands, oak woodland, alkali sink scrubland, vernal pool areas, and alkali meadow communities. San Joaquin kit foxes are also known to occur in extensively modified habitats, such as oil fields and wind turbine facilities (USFWS 1998). They are present, but generally less abundant, in other highly modified landscapes, such as agricultural row crops, irrigated pastures, orchards, vineyards, and grazed annual grassland. They prefer habitats with loose-textured soils that are suitable for digging, but they occur on every soil type found in the Central Valley and surrounding foothills.

The diet of San Joaquin kit foxes varies with season and geographic locality, based on local availability of potential prey. Typically the diet consists of kangaroo rats, pocket mice, white-footed mice, and other nocturnal rodents. San Joaquin kit foxes also prey on black-tailed hares, Nelson's antelope squirrels, desert cottontails, ground-nesting birds, and insects (USFWS 1998).

San Joaquin kit foxes can, but do not necessarily, breed their first year. Adult pairs of foxes stay together throughout the year and can begin breeding at one year of age. During September and October, females begin to clean and enlarge their pupping dens, and mating usually occurs between December and March. Litters of two to six pups are born between February and late March, with pups emerging from the den after about a month. Population growth rates generally

vary positively with reproductive success, and kit fox density is often positively related to both current and the previous year's prey availability (Cypher et al. 2000).

San Joaquin kit fox dens are generally located in open areas with grass or grass and scattered brush, and seldom occur in areas with thick brush. Preferred sites are relatively flat, well-drained terrain (USFWS 1998). The kit fox requires underground dens for temperature regulation, shelter, reproduction, and predator avoidance. Dens are usually located on loose-textured soils on slopes less than 40 degrees, but the characteristics (number of openings, shape, slope, aspect) of dens vary across the fox's geographic range. Kit foxes dig their own dens, but also use those constructed by other animals. They also frequently use human-made structures (culverts, abandoned pipelines, or banks in sumps or roadbeds) as den sites.

Kit foxes may range up to 20 miles at night (Girard 2001) during the breeding season, and somewhat less (6 miles) during the pup-rearing season. Home ranges vary from less than 1 square mile up to approximately 12 square miles (Knapp 1978; Spiegel and Bradbury 1992; White and Ralls 1993).

OCCURRENCE WITHIN THE PERMIT AREA

San Joaquin kit foxes were not observed within the Permit Area or on surrounding lands during night spotlighting surveys or track and camera station monitoring conducted for the Project (Quad Knopf 2010c); however, they were observed on land adjacent to the east side of Site 15-S (see Appendix B). Potential San Joaquin kit fox dens were located on lands adjacent to the north and west of Site 1-C, and a San Joaquin kit fox skull was found on adjacent lands along the western boundary of Site 1-C (see Appendix B). The CNDDDB reports 25 records of San Joaquin kit foxes within five miles of the Permit Area (see Figure 3-5B) between 1971 and 2002. The largest concentration of these records is located to the west and south of the Permit Area. The Solar Sites and all other portions of the Permit Area, including Conservation Sites, are dispersal habitat for the San Joaquin kit fox (See Appendices G and H).

Tipton Kangaroo Rat (Dipodomys nitratooides nitratooides)

STATUS

The Tipton kangaroo rat was listed as endangered by the U.S. Department of the Interior in 1988, and listed as endangered by the State of California in 1989. Recovery actions covered in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) include habitat management studies of Tipton kangaroo rats at sites representing the range of existing habitat conditions for the species; studies of competition between Tipton and Heermann's kangaroo rat, focusing on how different habitat management affects the population dynamics of the two species at sites of coexistence; population studies that measure population size and environmental fluctuations at sites representative of the range of natural land area and habitat conditions for the species; and inventories and assessments of existing natural lands.

LIFE HISTORY

The historical geographic range of Tipton kangaroo rats was over 1.7 million acres of arid-land communities occupying the valley floor of the Tulare Basin. By 1985, the inhabited area had been reduced to about 60,000 acres or about 4 percent of the historically occupied acreage. Currently, Tipton kangaroo rats inhabit small, scattered, isolated fragments of remnant habitat. In the southern San Joaquin Valley, this includes the Kern and Pixley National Wildlife Refuges, and other scattered areas within Kern, Tulare, and Kings Counties.

The Tipton kangaroo rat is limited to arid-land communities occupying the valley floor of the Tulare Basin in level or nearly level terrain. They occupy alluvial fan and floodplain soils ranging from fine sands to clay-sized particles. Generally, woody shrubs of one or more species are sparsely scattered over occupied terrain with scant-to-moderate ground cover of grasses and forbs. Tipton kangaroo rats are commonly associated with spinescale saltbush (*Atriplex spinifera*), Allscale saltbush, leafcover saltweed (*Atriplex covillei*), quailbush, iodine bush, alkali goldenbush, mesquite (*Prosopis glandulosa*), and seepweed (Williams 1985).

The Tipton kangaroo rat eats mostly seeds, with small amounts of green, herbaceous vegetation and insects supplementing their diet when available (USFWS 1998). Little is known about Tipton kangaroo rat reproduction in the wild. Mating appears to begin in the winter and most females seem to have one litter per year, although litters of two or more may be born during exceptional years (USFWS 1998). Young are born in burrows.

Burrow systems are usually in open areas, but may occur in thick scrub. They are typically simple, but may include interconnecting tunnels. Most are less than 10 inches deep. Burrows are most prominent on slightly elevated mounds, the berms of roads, canal embankments, railroad beds, and bases of shrubs and fences where wind-blown soils accumulate above the level of surrounding terrain.

Loss, fragmentation, and degradation of habitat associated with agricultural conversion in the San Joaquin Valley continue to decrease the remaining habitat of the Tipton kangaroo rat. As a result of industrial and agricultural related developments, cultivation, formation of patches of exotic grasses, urbanization, and flooding, there is an increase of habitat destruction or modification (USFWS 1998). The more common Heermann's kangaroo rat may competitively exclude or reduce the density of Tipton kangaroo rats where they co-occur.

OCCURRENCE WITHIN THE PERMIT AREA

Tipton kangaroo rats were trapped on Site 1-C and portions of Site 9-C, and on lands adjacent to Sites 2-S, 3-S, and 10-C during the small mammal trapping surveys conducted for the Project (Quad Knopf 2010c). This species may be present within the railroad easement in Sites 6-S and 7-S, and along the South Lake Road easement to the north of Site 7-S and to the east of Site 15-S, although the species was not captured at those locations. Similarly, this species may be present along the berm and canal embankments that are located at the north of Site 3-S. CNDDDB records from 1985 show occurrence of the species along the south border of Site 1-C, north border of Site 5-S, to the east of Site 2-S, and on and to the west of Site 3-S. The regular disking on the

Solar Development Footprint has eliminated this species from areas where it once occurred. CNDDDB records of Tipton kangaroo rat consist of multiple records from 1985 located to the north of Site 4-S, within a five-mile radius of the Permit Area; and a record located southwest of Site 5-S from unknown year. Currently, no habitat that would support this species exists at these locations. Tipton kangaroo rat is expected to forage onto the Solar Development Footprints of Sites 2-S and 3-S, and perhaps into Sites 6-S and 7-S. This species is likely to invade at least some of the Solar Sites very soon after cessation of disking.

Nelson's Antelope Squirrel (Ammospermophilus nelsoni)

STATUS

The Nelson's antelope squirrel was designated a threatened species by the State of California in 1980. The Nelson's antelope squirrel was removed as a Category 1 candidate for federal listing in 1995. Conservation actions are addressed in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998). Actions required to conserve the Nelson's antelope squirrel include the following: determination of habitat management prescriptions for Nelson's antelope squirrels on the southern San Joaquin Valley floor; an inventory of potential habitat for Nelson's antelope squirrels in the Allensworth, Semitropic Ridge, and Kettleman Hills natural areas, and along the western edge of the Valley between Pleasant Valley, Fresno County, and McKittrick Valley-Lokern Area, Kern County; protection of additional habitat for Nelson's antelope squirrels in the Pixley National Wildlife Refuge, Allensworth Natural Area; development and implementation of a population monitoring program for Nelson's antelope squirrels at sites representative of their existing geographic range; and protection of additional habitat for Nelson's antelope squirrels in the Panoche Region of western Fresno, eastern San Benito Counties, western Kern County, and the Semitropic Ridge Natural Area (USFWS 1998).

LIFE HISTORY

Nelson's antelope squirrels are restricted to desert and scrubland habitats. The historical geographic range occurred within the southern and western areas of the Tulare Basin, the San Joaquin Valley, and up to the Cuyama Valley and the Carrizo and Elkhorn Plains. Its current range is now estimated to be uncultivated habitat within the San Joaquin Valley. This species is thought to be extirpated from the Tulare Basin floor, only occurring in the marginal habitat in the foothills of the mountains bordering the west of the basin. Populations of Nelson's antelope squirrel occur in Lokern and Elk Hills, and on the Carrizo and Elkhorn Plains. In all, approximately 102,055 acres have been deemed fair to adequate habitat for Nelson's antelope squirrels within its historic range (USFWS 1998).

Habitat of Nelson's antelope squirrels consist of grasslands with moderate shrub cover, which includes such species as salt bush, ephedra (*Ephedra* sp.), bladder pod (*Peritoma arborea*), goldenbush (*Isocoma* sp.), snakeweed (*Gutierrezia* sp.), and others. The squirrels live in small underground familial colonies on sandy, easily excavated grasslands.

Nelson's antelope squirrels are opportunistic omnivores. Common food is green vegetation and insects, but is largely dependent on what is seasonally available (Hawbecker 1975; Harris 1993). Nelson's antelope squirrels are largely diurnal and are active for much of the day. However,

during extreme high or low temperatures they will often stay in their ground burrows. Nelson's antelope squirrels often excavate their own ground burrows, but if the opportunity presents itself they will use a burrow that was constructed by another small mammal, such as kangaroo rats.

Nelson's antelope squirrels breed between late winter and early spring. Young are usually born between March and April. Only one litter is produced each year. Mortality rates of young are about 70 percent their first year, and the annual adult survival rate is between 50 and 60 percent (Williams and Tordoff 1988).

Nelson's antelope squirrels are social animals (Grinnell and Dixon 1916). They do not expend much energy throughout the day because of the extreme temperatures in their environment (Hawbecker 1953), and there is little activity during the heat of the day. Although there is no evidence of hibernation, the squirrels are not bothered by the cold and can survive temperatures below freezing in their burrows (Hawbecker 1958). The squirrels are also known to fully stretch out and roll over in the dust on the ground. These dust baths appear to be very enjoyable activities for the squirrels and may also be used to prevent infestation of parasites (Hawbecker 1959).

Nelson's antelope squirrels are cautious when emerging from their burrows (Grinnell and Dixon 1916). They have a specific route that they follow when foraging for food. If danger seems near, they will run into a burrow along their foraging route to get to safety (Hawbecker 1953). They move quickly and do not spend much time in one place (Hawbecker 1975). The whitish color of the underside of their tails can be seen when they run. The squirrels will curl their tails forward over their backs, and flick and twitch them back and forth as they run (Grinnell and Dixon 1916). This movement can present the illusion of thistledown fluttering in the wind, which could be ignored by any potential predators (Grinnell and Dixon 1916). To further help prevent predation, the Nelson's antelope squirrel has an alarm call. These alarm calls are not loud, but associated with convulsive body movements (Taylor 1916).

OCCURRENCE WITHIN THE PROJECT AREA

Nelson's antelope squirrels were observed on 83.25 acres of native habitat on the southeastern portion of Site 9-C, adjacent to the north and west sides of Conservation Site 1-C, on the west side of Conservation Site 9-C, and on the west and south sides of Conservation Site 10-C (See Appendix B). Nelson's antelope squirrel was not observed to occur within any of the Solar Sites and there is currently no habitat on the Solar Sites that could support this species. All lands in the Permit Area are potential habitat and with the cessation of disking and natural revegetation of project lands, foraging and breeding habitat is expected to occur. At that time, the Project lands will become more suitable to support Nelson's antelope squirrel and will place the species at risk of project impacts.

The CNDDDB has 28 records of Nelson's antelope squirrels occurring within a five-mile radius of the Project site between 1918 and 2006. Historically the largest concentration of sightings is to the west of Sites 1-C and 5-S; however, habitat capable of supporting this species is no longer present west of Site 5-S. The proximity of Nelson's antelope squirrel to the Project makes it likely that the species will become present at some point over the 35-year period of the permit.

STATUS

The western burrowing owl is listed by CDFW as a California Species of Concern (CSC) and is protected by the Migratory Bird Treaty Act (MBTA). There is no current federal status, but there have been several petitions to list this owl as a federally threatened or endangered species. It is possible that it will become listed during the life of the project.

There is no recovery plan for the western burrowing owl. Common management efforts employed to conserve existing western burrowing owl colonies include prevention of all disturbances during the nesting season, installation of permanent artificial burrows, and management of the vegetation around the burrows by mowing or managed grazing.

LIFE HISTORY

The western burrowing owl is a summer resident in the western half of the U.S., and a year-round resident in the southwestern portion of the U.S., and northern and central Mexico. In California, the species inhabits the lowlands of the Central Valley and the desert environments of the southeastern part of the state. Although western burrowing owls still exist in most portions of their historic range, their population densities have declined due to habitat loss, degradation, and fragmentation.

Western burrowing owls occupy grasslands, deserts, sagebrush scrub, agricultural areas (including pastures and untilled margins of cropland), earthen levees and berms, coastal uplands, and urban vacant lots; as well as the margins of airports, golf courses, and roads. Western burrowing owls select sites that support short vegetation, even bare soil, presumably because they can easily see over it. However, they will tolerate tall vegetation if it is sparse. Owls will perch on raised burrow mounds or other topographic relief, such as rocks, tall plants, fence posts, and debris piles, to attain good visibility (Haug et al. 1993). Western burrowing owls are primarily crepuscular in their foraging habits, but will hunt for insects and small vertebrates during both day and night.

The breeding season of the western burrowing owl begins in March or April and extends through August. Average clutch size is five or six eggs, and they rarely produce a second brood. Where site conditions are optimal, western burrowing owls sometimes form loose colonies, which is unusual for avian predators (Haug et al. 1993). The female will lay an egg every 1 or 2 days until she has completed a clutch, which can consist of 4 to 12 eggs (usually 9). She will then incubate the eggs for three to four weeks while the male brings her food. After the eggs hatch, both parents will feed the chicks. Four weeks after hatching, the chicks are able to make short flights and begin leaving the nest burrow. The parents will still help feed the chicks for 1 to 3 months. While most of the eggs will hatch, only 4 to 5 chicks usually survive to leave the nest.

During the breeding season, western burrowing owls spend most of their time within 162 to 325 feet of their nest or satellite burrows (Haug and Oliphant 1990). During the day, they forage in the vicinity of the natal burrow, where they find it easy to prey on insects in low, open vegetation. Western burrowing owls will nest in loose colonies, although owls display intraspecific territoriality immediately around the nest burrow (Haug et al. 1993). Western

burrowing owls in California typically begin pair formation and courtship in February or early March, when adult males attempt to attract a mate.

When hunting, western burrowing owls will take advantage of natural perches to wait until they spot prey. They then swoop down on prey or fly up to catch insects in flight. Sometimes, they chase prey on foot across the ground.

An immediate threat to the western burrowing owl is the conversion of grassland habitat to urban and agricultural uses, and the loss of suitable agricultural lands to development. Equally important is the loss of fossorial rodents, such as small ground squirrel species, across much of the owl's historical range. Another cause of population declines is thought to be pesticide use, but evidence does not clearly indicate that other contaminants are reducing populations (Gervais et al. 1997). Habitat fragmentation (Remsen 1978) probably increases foraging distances, making hunting less efficient and potentially reducing reproductive success. In urban settings, owls occurring in isolated habitats may experience frequent disturbances from adjacent land uses and barriers to foraging areas.

OCCURRENCE WITHIN THE PERMIT AREA

Western burrowing owls were observed on Solar Sites 3-S, 6-S, 7-S and on Conservation Sites 3-C2 and 9-C (see Appendix B) (Quad Knopf 2010c). Western burrowing owls were also observed adjacent to Sites 1-C, 2-S, 2-M, 3-C, 5-S, 10-C and 15-S (Quad Knopf 2010a). Site 17-C contains suitable habitat to support this species, but it was not observed during surveys of that Site.

Quad Knopf found nine records of western burrowing owls occurring within a five-mile radius of the project area (CDFG 2009) (see Figure 3-5A). One of those records, from 2005, is of western burrowing owl located on Sites 3-S, 3-C, 3-C2, and 3-M. The CNDDDB records from 2000, 2002, 2004, 2006 found western burrowing owls occurring between one and five miles to the northwest of Site 1-C, and occurrence records from 1998, 1999, and 2004 found western burrowing owls about 1.3 miles to the south of Site 5-S (see Figure 3-5A).

Blunt-nosed Leopard Lizard (Gambelia sila)

STATUS

The blunt-nosed leopard lizard was listed as endangered by the U.S. Department of the Interior in 1967 and by the State of California in 1971, and is also listed as a fully protected species by the state.

A recovery plan for this species was first prepared in 1980 and revised in 1985. Conservation efforts have included habitat and population surveys, studies of population demography and habitat management, land acquisition, and development of management plans for public lands that have benefitted blunt-nosed leopard lizards as well as other listed species. The three most important factors in recovering the blunt-nosed leopard lizard are determining appropriate habitat management and compatible land uses for the species, protecting additional habitat for the species in key portions of its range, and gathering additional data on population responses to

environmental variation at representative sites in the species' extant geographic range (USFWS 1998).

LIFE HISTORY

Historically, the blunt-nosed leopard lizard occurred in the southern San Joaquin Valley and adjacent western and southern foothills. The current distribution is restricted to scattered sites in the southern San Joaquin Valley, Carrizo Plain, Elkhorn Plain, and southeastern Cuyama Valley. This distribution roughly corresponds with the western half of Kern County, the eastern boundary of San Luis Obispo and Kings Counties, the western boundary of Fresno County, and extreme southwestern Tulare County. These lizards are rare and localized in suitable habitat throughout their current range (Quad Knopf 2010c).

Blunt-nosed leopard lizards are typically associated with sparsely vegetated, arid habitats of saltbush scrub, alkali sinks, non-native grasslands, Ephedra scrub, and washes. Most of these habitat types have been lost to agricultural conversion, oil production, and urbanization; and the blunt-nosed leopard lizard currently occurs in less than 15 percent of its historic distribution (USFWS 1998).

The blunt-nosed leopard lizard is a carnivorous predator that feeds primarily on insects (mostly grasshoppers, crickets, and moths) and other lizards. Lizard species taken as prey include side-blotched lizards, coast horned lizards, California whiptails, and spiny lizards. Young of its own species are also eaten (USFWS 1998).

Blunt-nosed leopard lizards are in reproductive status from April to July. Females typically lay eggs between May and June. Clutch size averages three eggs, with a range of one to six eggs. One clutch per season is the normal pattern, but females may produce a second, third, or even fourth clutch if environmental conditions are favorable (Jennings 1995; Germano and Williams 1992, 2005; USFWS 1998). Quad Knopf found no current data for population densities of blunt-nosed leopard lizards, but Uptain *et al.* (1992) reported densities ranging from 0.1 to 4.2 individuals per acre at the Pixley National Wildlife Refuge in Tulare County.

The optimum activity period for the blunt-nosed leopard lizard occurs when air temperatures are between 77 and 95 degrees F and soil temperatures are between 86 and 122 degrees F. On hotter days, they are active in the early morning and late afternoon, and use small rodent burrows during the day. Blunt-nosed leopard lizards are highly territorial.

OCCURRENCE WITHIN THE PERMIT AREA

No blunt-nosed leopard lizards were observed on the Solar Sites (Quad Knopf 2010c, 2012); however, four blunt-nosed leopard lizards were observed on lands adjacent to Sites 2-S and 3-S (see Appendix B) (Quad Knopf 2010c). The closest known CNDDDB record reported the species 1.8 miles northwest of Site 1-C in 2002 (Figure 3-5D). Very little blunt-nosed leopard lizard habitat is available within the Permit Area due to regular disking. Limited use of the Permit Area by blunt-nosed leopard lizards may occur in the northwest corner of Site 1-C, the eastern side of Site 2-S, and the western side of Site 3-S.

4.0

ADVERSE EFFECTS ON COVERED SPECIES

4.0 ADVERSE EFFECTS ON COVERED SPECIES

This chapter describes the potential adverse effects to and anticipated take of Covered Species as a result of impacts related to Covered Activities (see Chapter 2, Section 2.3). Direct development of solar facilities will impact 3,700.5 acres, which constitutes the Solar Development Footprint (Chapter 2, Section 2.2). Covered Activities, such as construction of perimeter security fencing, transmission line upgrading, and management activities occurring within Movement Corridors and on existing easement and setbacks will occur outside of the Solar Development Footprint and will impact the larger area of the Solar Sites, resulting in adverse effects to Covered Species occurring on 3,798.2 acres. Anticipated take from direct effects can be “expressed as a number of individual animals, as habitat acres, or other appropriate measures” (USFWS 1996). As defined in this MSHCP, direct effects are quantified as loss of habitat acres and will result in take in the form of “harm and harass” of Covered Species due to the loss of 3,798.2 acres of potential dispersal and foraging habitat. The potential for take in the form of capture also exists due to the possible need for trapping and relocating Tipton kangaroo rats and Nelson’s antelope squirrel during operations and maintenance activities and just prior to decommissioning.

Direct and indirect effects to Covered Species and the effects of take for each Covered Species are discussed. The form of take for each Covered Species and the specific acreage of impact for each Covered Activity are provided in Table 4-1. Direct effects are defined as those adverse effects that will result directly from the Covered Activities and may result in take of the species. Direct effects can occur when Covered Activities substantially alter the ground surface or subsurface of the Permit Area and disturb habitat; such as during trenching for electrical wire installation or during installation of perimeter security fencing. Conservation measures can also result in direct effects to Covered Species by a variety of means, for example from the installation of fencing or through trapping and handling of species during studies.

Covered Species currently only occur on the Solar Sites, Movement Corridors, and Conservation Sites (although there are exceptions) as transient dispersers or foragers and are only present infrequently and in low numbers. The entire Permit Area does serve as potential habitat for all Covered Species and so take is assessed throughout the Permit Area. The anticipated direct effects related to Covered Activities that may result in take of Covered Species are provided in Section 4.2 below.

Indirect effects of the project are defined as “those adverse effects that are caused by the proposed action that are later in time, but are still reasonably certain to occur” (50 CFR 402.02). Similar to direct effects, indirect effects due to Covered Activities may occur at any time during the project. Examples of indirect effects are changes in predator/prey relationships, changes in water availability and soil moisture, or changes in soil chemistry that ultimately affect Covered Species. Indirect effects may impact the species through direct mortality or through alteration in habitat leading to reduced longevity and/or fitness.

An interpretation of the effects of any take of Covered Species is a required component of an HCP and describes how the project related activities will avoid adverse effects to the overall survival of Covered Species and how conflicts with broader conservation programs will be avoided. Effects of take are weighed against the stability and survival of the local population and the recovery and continued existence of the species as a whole.

**Table 4-1
MSHCP Covered Activities and Associated Forms of Take**

Covered Activity	Specific effected acreages for Covered Activities	Form of Take			
		harass	harm	capture	kill
Clearing, grading, leveling, and compacting	3,798.2	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None
Establishing and maintaining staging areas and access roads	41.3	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	None
Delivery and storage of materials and equipment	3,700.5	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	None
Drainage and erosion control	22.15	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	None
Fencing	71.2	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	None
Lighting	None	-SJKF -TKRA	None	None	None
Geotechnical drilling and testing	7.4	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None	None
Installation of signs	0.1	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None	None
Managing waste (non- hazardous & hazardous)	3,798.2	None	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None
Testing, plugging and abandoning wells	6	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None	None

**Table 4-1
MSHCP Covered Activities and Associated Forms of Take (Continued)**

Covered Activity ¹	Specific effected acreages for Covered Activities	Form of Take ²			
		harass	harm	capture	kill
Buildings and solar panel construction	3,700.5	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	None
Construction of overhead AC transmission lines	3.08	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	None
Paving of access roads and driveways	1.7	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None
Landscaping/site enhancement	10.9	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None
Solar panel cleaning and maintenance	3,700.5	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	-TKRA -NASQ*
Vegetation and weed management	3,700.5	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	-TKRA -NASQ*
Removal of fencing, staging areas, and access roads	92.9	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	-TKRA -NASQ*
Removal of buildings and solar systems	3,700.5	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	-TKRA -NASQ*
Topographic contouring	42.09	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	None	None
Monitoring, implementing the conservation program, and research	3,798.2	-SJKF -TKRA -NASQ -WEBO -BNLL	-SJKF -TKRA -NASQ -WEBO -BNLL	-TKRA -NASQ	-TKRA -NASQ*

** During removal of the fencing, staging areas, and access roads during decommissioning, measures will be incorporated to reduce the potential for lethal take to occur, but some risk of lethal take may remain.*

4.1 Definitions of Take

Under the FESA, “Take” means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [16 USC §1533(19)].” The USFWS defines “harm” as any act that leads to mortality or injury to wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns. The USFWS defines “harass” to mean “an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering” (50 CFR 17.31). Under the context of this MSHCP, “capture” will consist of trapping Tipton kangaroo rats and Nelson’s antelope squirrels as necessary to avoid and minimize lethal take from operations and maintenance and decommissioning activities. While very unlikely, trapping events have the potential to cause mortality of trapped animals resulting in lethal take (“kill”).

The FESA protects plant species and prohibits the removal, possession, malicious damage to, or the destruction of listed plants when they are under Federal jurisdiction (e.g., on Federal lands); and the removal, cutting, digging up, or damage or destruction of any listed plant species on any other area in knowing violation of any state law or regulation or in the course of any violation of a state criminal trespass law [16 USC 1538(a)(2)].

4.2 Project Effects and Take of Covered Species

Take resulting from direct adverse effects of project activities has the potential to occur during all phases of the project. Direct adverse effects are those effects that result in the direct loss of habitat or direct lethal take of individuals of Covered Species. Covered Activities and the associated minimization and avoidance measures are discussed in detail in Chapter 2. Implementation of the minimization and avoidance measures presented in Chapter 2 will greatly reduce or eliminate the risk of the potential for take to occur due to direct adverse effects of Covered Activities. Nevertheless, there is a risk of direct adverse effects including lethal take to occur as a result of some covered activities as summarized in Table 4-1.

Complete development of the Maricopa Sun Solar Complex will result in the loss of 3,798.2 acres of potential habitat for all Covered Species. The project lands (Solar Sites, Movement Corridors, and Conservation Sites) are, with few exceptions, currently in a farm-ready, disked state and provide poor to no habitat for any of the Covered Species (see Chapter 3 for specific site descriptions). The potential does exist, however, that the project lands could return to a more natural state once disking has ceased, and could therefore support Covered Species at a distribution and level of abundance that does not currently exist.

The Maricopa Sun Solar Complex will ultimately lead to an improvement in habitat for Covered Species on all project lands (5,692.6 acres), occurring at various intervals over the course of the 35-year HCP timeframe, or after decommissioning. Habitat enhancements and management for Covered Species will begin immediately on the conservation lands as described in Chapters 5

and 6 and the Habitat Management Plan (Appendix C). The Solar Sites will not be managed for Covered Species during the life of a solar project, and Covered Activities occurring on the Solar Sites are assumed to result in take of Covered Species. Take is quantified here as acreage of potential habitat.

Take of dispersal habitat and potential foraging/breeding habitat will occur on the Solar Sites as they become developed. Take will occur at the onset of pre-construction activities on each Solar Site or portion of a Solar Site and no additional take of habitat will occur after solar facility development has been completed. The development of solar facilities (and associated take of habitat) will be phased over the first 10-15 years of the MSHCP permit term. Capture of Covered Species is likely to occur during the operations and maintenance and decommissioning phases of the project as well as in association with the studies aimed at monitoring of effects and effectiveness that will be conducted in association with this MSHCP. Minimization and avoidance measures will be implemented throughout the 35-year MSHCP permit term (see description of measures in Chapter 2) to reduce or eliminate the potential for lethal take (see description of take, Section 4.1 above) of Covered Species to the extent possible.

Trapping for avoidance of Covered Species would only be implemented as needed during ground disturbing activities and conducted as a measure to avoid lethal take. Lethal take is not anticipated to occur during any solar development phase because of the implementation of project related minimization and avoidance measures. In the event that lethal take does occur as a result of Covered Activities on Covered Lands (within the Permit Area), the incidence will be reported to the project's lead biologist and the USFWS will be notified by phone within 24 hours. Written documentation will be provided to USFWS within five business days. Each incident of lethal take of Covered Species will be investigated to determine the cause. Minimization and avoidance measures will be enhanced if it is determined that doing so will prevent the potential for future incidents.

Prior to the start of any operations and maintenance or decommissioning activities, pre-activity surveys will be conducted to assess the extent to which Covered Species have occupied the Solar Sites during the life of the project. Information on the location and abundance of Covered Species, gathered during these pre-activity surveys, will be used to plan the implementation of measures necessary to minimize or avoid take during the operations and maintenance or decommissioning phases. As a means of avoiding lethal take of the Tipton kangaroo rats, Nelson's antelope squirrels, and western burrowing owls, USFWS-approved relocation plans will be put into affect (Appendices E and F) when the species occur in areas that will be difficult or impossible to avoid by project activities. The need to capture animals will be directly related to the occurrence of species on the Solar Sites and the level of ground disturbance associated with any needed repairs to solar facilities. The preferred approach to the relocation plan for the Tipton kangaroo rat and Nelson's antelope squirrel will be to trap and "hold" individuals for the duration of the given activity and release individuals back to the location where they were originally trapped once the activity has been completed (Appendix F). Artificial burrows may be required for successful release if the given activity has resulted in eliminating the existing burrows. To ensure impacts to western burrowing owls are minimized or avoided, passive relocation techniques will be implemented (Appendix E).

4.2.1 SAN JOAQUIN KIT FOX

The San Joaquin kit fox is known to occur in the vicinity of the Permit Area though it only occurs on the Solar Development Footprint as a transient, utilizing the Solar Sites as dispersal habitat (see Chapter 3, Table 3-6 and Section 3.3.2 and Appendix B for detailed occurrence information).

Direct capture and lethal take of the San Joaquin kit fox during Covered Activities will be avoided by implementing minimization and avoidance measures (Chapter 2, Section 2.3.5). Covered Activities could result in other direct effects to the San Joaquin kit fox in the form of harm and harassment through take of dispersal habitat and collapsing of dens to passively exclude individuals from Project activity areas. The total land area that will be impacted by the Project and where the San Joaquin kit fox could be exposed to direct effects is 3,798.2 acre, which includes all of the Solar Sites. Implementation of the minimization and avoidance measures will reduce take in the form of harm and harassment from occurring on the Conservation Sites or within the Movement Corridors.

Direct Effects

During the pre-construction and construction phases of each solar facility development, the Solar Sites will be fenced with perimeter security fencing. Fencing the Solar Sites is identified as a direct effect to San Joaquin kit foxes because of the potential to harm (see definition of take in Section 4.1 above) the species by restricting access to dispersal habitat. Build-out of all Solar Sites will be phased over a 10-15 year period at which time all 3,798.2 acres of the Solar Sites will be fenced. Take of dispersal habitat could lead to harm by limiting the species ability to move through the habitat in search of food, shelter, or reproductive opportunities.

In addition to fencing the Solar Sites, other Covered Activities have the potential to harm and harass the San Joaquin kit fox. Covered Activities will include ground disturbance using heavy equipment and high vehicle traffic levels, which could result in ground vibrations and high noise levels. Hazardous and non-hazardous waste materials can be generated any time construction crews are present, introducing the potential for take of San Joaquin kit fox. Covered Activities with the potential to harm and harass San Joaquin kit fox include: clearing, grading, leveling, and compacting the Solar Development Footprint; geotechnical drilling and testing; establishing staging areas and access roads; delivery and distribution of building materials and equipment; drainage and erosion control; testing, plugging, and abandoning oil wells; construction of operations and maintenance buildings and solar arrays; construction of transmission lines and the use of helicopters; trenching for the installation of electrical wiring; paving of access roads and driveways; cleaning of the solar arrays during the operations and maintenance phase; removal of all solar arrays, operations and maintenance buildings, staging areas, and access roads during the decommissioning phase; mechanical and chemical vegetation/weed control; and carrying out the enhancement measures on the conservation lands.

During the operations and maintenance and prior to the decommissioning phase, it may become necessary to remove San Joaquin kit fox dens from in and around the solar facilities to passively exclude the species in an effort to avoid lethal take of individuals during Project activities.

Although it cannot be accurately determined how many individual dens will be present on the Solar Sites at the time of operations and maintenance activities or in 35 years when the solar facilities will be decommissioned, an estimate can be made based on average den densities in San Joaquin kit fox habitat. The average population density of San Joaquin kit fox in core population centers near the Project site (Carrizo Plain Natural Area) was determined to be 0.39 – 0.62 individuals per square miles (White and Ralls 1993). Based on this population density figure, it can be estimated that, given the relatively poor habitat quality in the vicinity of the Project, fewer than 0.39 individuals per square mile can be expected to occur on the Maricopa Sun solar site. The impact area of the Project is 3,798.2 acres, or roughly six square miles. At full Project build-out, the population of San Joaquin kit fox on the project site at any one time could be estimated to be a maximum of 2.34 individuals. This population size is not expected to be reached until the Solar Sites recover from disking, which could take several growing seasons. Over the 35-year life of the project, take in the form of collapsing dens is not anticipated to exceed 70 dens (approximately two dens per year). Lethal take of San Joaquin kit fox will be avoided during den collapsing by implementing standard USFWS protocols for den excavation (e.g., tracking, monitoring, one-way doors, and implementing safe excavation techniques).

General and species-specific minimization, avoidance, and mitigation measures will be implemented as part of the project to reduce the impact of the Covered Activities and the potential for take (Chapter 2, Section 2.3.5). The effects of fencing the Solar Sites will be minimized by designing the fencing to be permeable to wildlife and conducting inspections of the fencing to ensure that any obstructions to permeability are corrected in a timely manner (GM-9). To ensure that no additional take occurs, biological monitors will conduct pre- and post-activity sweeps (GM-1) prior to all project activities to identify any Covered Species present or any potential risks to Covered Species. All employees working on projects within the Maricopa Sun Solar Complex will be required to attend the EEP training (GM-2) to learn about the biological issues associated with the Project, to learn about the minimization, avoidance, and mitigation measures, and to learn how to identify and avoid impacts to San Joaquin kit fox and other special-status species in the vicinity of the Permit Area. Vehicle speed limits will be maintained at 10 mile per hour or less on project lands at all times and traffic will be limited to designated areas (GM-4). Covered Activities shall be restricted to day-light hours unless otherwise approved by USFWS (GM-5). Biological monitors will ensure that Covered Species are avoided during Covered Activities and that potential risks to Covered Species are remediated as soon as possible [e.g., ensure no trash remains on site at the end of the work day (GM-11)].

Specific measures taken to minimize and avoid take of San Joaquin kit fox include: pre-activity surveys conducted to determine if San Joaquin kit foxes are present near where Covered Activities will occur and establishment of avoidance areas (Environmentally Sensitive Areas or ESAs) in the event that dens are discovered (SJKF-1); provision of sloped banks or escape ramps of all trenches and holes less than 5 feet deep and covering of all trenches and holes greater than five feet deep (SJKF-3); all staged materials shall be capped and/or covered to prevent San Joaquin kit foxes from shelter in the materials (SJKF-4). Chapter 2 (Section 2.3.5) provides greater detail regarding pre- and post-activity sweeps, biological monitoring, and procedures for instances when a risk to Covered Species is identified.

In the event that work must take place in an area that contains a San Joaquin kit fox den, the USFWS will be consulted and approved den monitoring and collapsing will be conducted by an approved biologist. When activities are completed, post-activity surveys will be conducted to verify that there was no take of San Joaquin kit fox during the activity and to ensure that no hazardous or non-hazardous waste or other materials or supplies that have the potential to result in take are left behind.

Indirect Effects

Paving of roads and building areas and construction of drainages along roads and other paved areas could change soil moisture and chemistry in localized areas. Changes in soil moisture and chemistry could result in changes in plant distributions and species composition and could change the local plant community that Covered Species rely upon. This indirect effect would occur during the operations and maintenance phase on the Solar Sites and throughout the conservation lands once disking ceases and enhancement and management has begun. Soil moisture might affect vegetation in a beneficial way (cessation of disking and additional water would support more vegetation), or in an adverse way (additional water may encourage non-native “weedy” plants or a vegetation density greater than that preferred by Covered Species). A change in vegetation could adversely affect the San Joaquin kit fox, but mitigation measures that manage and restore vegetation (Chapter 5; Appendix C) would limit the amount of harmful vegetation and reduce unsuitable vegetation density, resulting in overall benefits for the San Joaquin kit fox through improved habitat conditions. Therefore, it is anticipated that paving of roads and building areas, and construction of drainages along roads and other paved areas, will not adversely affect the San Joaquin kit fox.

Predation by coyotes (*Canis latrans*) and possibly red fox (*Vulpes vulpes*) could increase within the Permit Area and adversely affect the San Joaquin kit fox. If the San Joaquin kit fox becomes more abundant on the Solar Sites, Conservation Sites, and Movement Corridors during the course of the project, a concomitant increase in predation on San Joaquin kit foxes would be anticipated.

Effects of Take

Implementation of this MSHCP will have minimal negative effects on the local population of San Joaquin kit foxes. The San Joaquin kit fox does not currently den on the Solar Sites and no foraging or breeding habitat will be removed by the project. The development of 3,798.2 acres will initially interfere with dispersal and local movement patterns of San Joaquin kit foxes, but implementation of the HCP will provide connectivity for dispersal and movement through Movement Corridors and Conservation Sites.

Implementation of this HCP will not jeopardize the continued existence of the San Joaquin kit fox. This species ranges from the southern San Joaquin Valley north to the southern Bay Area and west into the Carrizo Plains and Salinas Valley. Any adverse effect from the project would only effect the local population and those adverse effects are ameliorated by the provisions of the HCP. Accordingly the project will not adversely affect local, regional, or significant core populations, nor will it interfere with significant linkages or corridors between those populations.

Implementation of this HCP will not conflict with the Recovery Plan for the San Joaquin kit fox (USFWS 1998), and in fact, will directly support the goals of the Recovery Plan by enhancing connectivity of the regional metapopulation and protecting portions of a dispersal corridor between the West Kern core population and Bakersfield satellite population of San Joaquin kit foxes. Some conservation areas lie alongside the California Aqueduct and along the northern border of Windwolves Preserve, and the protection and enhancement of these areas will contribute to the functionality of these critical dispersal corridors. Additionally, 5,692.6 acres of land will be ultimately recovered from agricultural use and restored to habitat suitable for San Joaquin foxes to use for foraging and breeding. Habitat enhancements such as construction of artificial dens and topographic relief will encourage San Joaquin kit foxes to use the conservation easements by providing cover and pupping dens and dry land for dispersal during flood periods.

4.2.2 TIPTON KANGAROO RAT

The Tipton kangaroo rat is not currently using the Solar Sites for foraging or breeding habitat. During protocol level trapping surveys, Tipton kangaroo rats were detected along site boundaries adjacent to Solar Sites 2-S and 3-S, and on Conservation Sites 1-C, 9-C, and 10-C (see Chapter 3, Table 3-6 and Section 3.3.2 and Appendix B for detailed occurrence information).

Direct lethal take of Tipton kangaroo rat individuals will be avoided during Covered Activities by implementation of the minimization and avoidance measures (see all measures outlined in Chapter 2, Section 2.3.5). Development of the Solar Sites will result in the loss of 3,798.2 acres of potential foraging habitat and could result in take of Tipton kangaroo rats through harm, harassment and capture. Implementation of the minimization and avoidance measures will prevent take from occurring on the Conservation Sites and Movement Corridors.

Direct Effects

During the pre-construction phase for each solar facility development, the Solar Development Footprints will be graded and compacted to prepare the land for construction. Land grading and compacting will eliminate 3,798.2 acres of potential foraging habitat for the Tipton kangaroo rat. Complete build-out of the Maricopa Sun Solar Complex will be phased over 10-15 years and take of Tipton kangaroo rat potential foraging habitat will be concurrent with the development of each solar facility. Take of potential foraging habitat could lead to harm of the Tipton kangaroo rat by limiting the species ability to obtain food and by eliminating opportunities for long-distance dispersal through the area.

In addition to grading and compacting, some other Covered Activities include the use of heavy equipment that will result in ground disturbance. These activities will generate ground vibrations and high noise levels. Ground disturbing activities could result in take of Tipton kangaroo rats in the form of harm and harassment. Covered Activities with the potential to harm and harass Tipton kangaroo rats include: geotechnical drilling and testing; establishing staging areas and access roads; delivery and distribution of building materials and equipment; drainage and erosion control; testing, plugging, and abandoning oil wells; construction of operations and maintenance buildings and solar arrays; construction of transmission lines; paving of access roads and

driveways; cleaning of the solar arrays during the operations and maintenance phase; removal of all solar arrays, operations and maintenance buildings, staging areas, and access roads during the decommissioning phase; mechanical and chemical vegetation/weed control; and carrying out the enhancement measures on conservation lands.

The potential for take as a result of high noise levels exist in areas where the Tipton kangaroo rat is known to have burrows along the boundaries of Solar Sites 2-S and 3-S. The Tipton kangaroo rat will also use artificial burrow-like structures such as culverts, pipes, pallets, and wire bales that will be staged throughout the Solar Development Footprints, and the species could be exposed to take in the event that materials are moved or buried while occupied. Delivery of materials and equipment will generate high vehicle traffic levels and hazardous and non-hazardous waste materials can be generated any time construction crews are present.

General and species-specific minimization, avoidance, and mitigation measures will be implemented as part of the project to reduce the impact of Covered Activities and the potential for take of Tipton kangaroo rats (Chapter 2, Section 2.3.5). Pre-activity surveys will be conducted to determine the location of Tipton kangaroo rat occupied areas and the location of all Tipton kangaroo rat burrows (GM-1, TNM-1). Trapping will be conducted when species verification is needed. All employees that will be working on site will be required to attend the EEP training to learn the minimization, avoidance, and mitigation measures and to learn how to identify and avoid Tipton kangaroo rats (GM-2). The impact on Tipton kangaroo rats from grading and compacting the Solar Sites will be minimized by erecting barrier fencing along project boundaries adjacent to known occupied areas to buffer the species from ground disturbance and noise (GM-10). Vehicle speed limits will be maintained at 10 miles per hour or less on the project at all times and vehicles will be limited to designated traffic areas and daylight hours of operation (GM-4). Biological monitors will be present to ensure that Covered Species are avoided by work crews and that remedial actions are taken as soon as possible to deal with all identified potential risks [e.g., ensure appropriate spacing of staged materials (GM-7), that all staged materials are covered (GM-8), and ensure that no trash that could attract the species remains on site at the end of the work day (GM-9)].

In the event that work must take place in an area that contains Tipton kangaroo rat burrows, agency consultation will be sought and measures outline in the relocation plan (Appendix F) will be implemented to safely exclude Tipton kangaroo rats from the work area to reduce Project impacts. Tipton kangaroo rats will be exposed to non-lethal take (capture) while conducting agency approved relocation. The need to capture and relocate animals will be predicated on animal occurrences and the degree of ground disturbing repairs that would be needed. Although the recolonization of the Project sites cannot be determined with certainty, estimates of the number of Tipton kangaroo rats that would potentially need to be relocated can be estimated by making some informed assumptions. Those assumptions are:

1. That the Tipton kangaroo rat would become present on all Solar Sites at an abundance representative of low quality habitat. Estimates on Tipton kangaroo rat population density have been made over the years (e.g., Hafner 1979; Clark et al. 1982) resulting in a range of 0.4 to 3.6 individuals per acre. Populations of Tipton kangaroo rats have been reported to fair poorly after prolonged drought and experience population densities of as

low as 0.4 individuals per acre even in relatively good habitat (Endangered Species Recovery Program unpubl. data). Similarly, severe flooding, which can occur in broad areas within the Tipton kangaroo rat range, can result in extensive extirpations. There currently is a lack of Tipton kangaroo rats and a lack of habitat that would support Tipton kangaroo rats on the Project sites due to recurring disking. There is an expectation that the Tipton kangaroo rat may become established on the sites and can persist concurrently with solar development, but there would be a lag between the cessation of disking and occupation of the Solar Sites. Even after the sites become occupied, the density of the Tipton kangaroo rats would be expected to be commensurate with poor quality habitat, with the Tipton kangaroo rat being present at an average density of 0.4 animals per acre over the 3,798.2 acres of the project site.

2. That ground disturbing repair and maintenance activities would be limited to 1% (37.98 acres) of the solar project lands per year,

Given these assumptions, a total of approximately 15 animals would need to be captured per year, with fewer animals captured during the initial 5 to 10 years of the project (due to a delay in occupation as well as inherent delays in solar development caused by “phasing” of the development). Given these assumptions, this would equate to a maximum estimate of 500 animals captured over the 35 year term of the project during operations and maintenance of the solar sites.

There would be a high degree of ground disturbing activities that would need to occur during decommissioning because of the removal of foundations, buildings, solar panel supports, and other components. Assumptions used to determine the number of Tipton kangaroo rats that would need to be captured during decommissioning are:

1. That the Tipton kangaroo rat would be widespread over the project sites by the time decommissioning activities would commence.
2. The density of kangaroo rats would remain at low levels (0.4 per acre).
3. That approximately half of the site acreage would be disturbed during decommissioning.

Given these assumptions, it is estimated that up to approximately 760 Tipton kangaroo rats (3,798.2 acres x 0.5 x 0.4 animals per acre = 759.6 animals) would need to be captured during decommissioning. Thus, during both operations and maintenance and during decommissioning, an estimated 1,260 Tipton kangaroo rats would be captured.

Indirect Effects

Paving of roads and building areas and construction of drainages along roads and other paved areas could change soil moisture and chemistry in localized areas. Changes in soil moisture and chemistry could result in changes in plant distributions and species composition and could change the local plant community that Covered Species rely upon. This indirect effect would occur during the operations and maintenance phase on the Solar Sites and throughout the conservation lands once disking ceases and enhancement and management has begun. Soil moisture might affect vegetation in a beneficial way (cessation of disking and additional water

would support more vegetation), or in an adverse way (additional water may encourage non-native “weedy” plants or a vegetation density greater than that preferred by Covered Species). A change in vegetation could adversely affect the Tipton kangaroo rat, but mitigation measures that manage and restore vegetation (Chapter 5; Appendix C) would limit the amount of harmful vegetation and reduce unsuitable vegetation density resulting in overall benefits for the Tipton kangaroo rat through improved habitat conditions. Therefore, it is anticipated that paving of roads and building areas, and construction of drainages along roads and other paved areas, will not adversely affect the Tipton kangaroo rat.

Predation by coyote, red foxes, San Joaquin kit fox, American badgers, snakes, owls, and hawks could increase within the Permit Area as the Tipton kangaroo rat population increases. Increased predation concomitant with an increase in abundance would be considered an overall improvement in the functionality of the ecosystem and a direct result of improved conditions for the Tipton kangaroo rat population.

Effects of Take

Implementation of this HCP will have no adverse effects on the local population of the Tipton kangaroo rat. This species is currently absent from the Solar Sites and no breeding or burrowing habitat will be taken by construction of the project. There is the possibility of taking up to 3,798.2 acres of potential foraging habitat, but because this area is disked and lacks vegetation, it is considered low quality foraging habitat. It is possible that the Tipton kangaroo rat could become established on the Solar Sites once solar facilities are constructed and disking ceases. If Tipton kangaroo rats do become established they would be susceptible to take from operations and maintenance activities and be subject to take during decommissioning activities. However, the occupation of these lands is not predictable, and if the Tipton kangaroo rat does become established it would represent an expansion of and benefit to the local population.

Implementation of this HCP will not jeopardize the continued existence of the Tipton kangaroo rat. This subspecies has a very limited distribution, which is loosely defined as the southern San Joaquin Valley floor, from the Kings River in the north to the California Aqueduct in the south. The western boundary of its range generally coincides with the California Aqueduct, and the eastern boundary of its current range is generally west of Highway 99. Within this distributional limit, this species occurs mostly on small, isolated fragments of habitat where it seems to persist quite well. Effects of the installation and operation of the Maricopa Sun Solar Complex would be localized, and would not extend to populations of the Tipton kangaroo rat that occur elsewhere in the San Joaquin Valley. The low abundance, limited distribution, and “patchiness of occurrences of this species within the Permit Area precludes substantial project effects on local populations, let alone populations occurring at distant locales.

Implementation of this HCP will not conflict with the Recovery Plan for this species (USFWS 1998) and in fact, it will support the goals of the Recovery Plan by providing “habitat management and protection of blocks of natural or restored habitat to maintain viable populations” of the Tipton kangaroo rat (USFWS 1998). Tipton kangaroo rats were detected in relatively high abundance on two parcels of land (Sites 1-C and 9-C) that will be placed into conservation easements during the life of the project. A total of 1,070.5 acres of conservation

easement will be established during the 35 year life of the project. Also, consistent with the Recovery Plan, 42.05 acres of topographic relief will be provided to allow Tipton kangaroo rats to escape the 100-year flood prone areas occurring on conservation lands, thus providing habitat free of flood risk (USFWS 1998). Finally, once the solar project has been decommissioned a total of 4,868.8 acres of habitat will be in conservation easements and managed as Tipton kangaroo rat habitat. These large blocks of land along with extant areas of habitat adjacent to the Solar and Conservation Sites provide an expansive area of Tipton kangaroo rat habitat suitable for the expansion of the local population and for the increase and preservation of the genetic pool in the region, which is another goal of the Recovery Plan (USFWS 1998).

4.2.3 NELSON'S ANTELOPE SQUIRREL

The Nelson's antelope squirrel is not currently using the Solar Sites for burrowing or breeding habitat and no foraging habitat currently exists on the Solar Sites. The Solar Sites could potentially serve as foraging habitat for Nelson's antelope squirrel if disking were to be discontinued. During protocol level surveys, the species was detected in areas of native habitat on Conservation Site 9-C and adjacent to Conservation Sites 1-C and 10-C (see Chapter 3, Table 3-6 and Section 3.3.2 and Appendix B for detailed occurrence information).

Areas where the species was detected lie within 0.5 miles of some of the Solar Sites making it likely that the species could occur on Solar Sites during the life of the project, and thus be subject to potential take. Direct lethal take of Nelson's antelope squirrel individuals will be avoided during Covered Activities by implementation of the minimization and avoidance measures (see all measures outlined in Chapter 2, Section 2.3.5). Development of the Solar Sites will result in the loss of 3,798.2 acres of potential foraging habitat and may result in take of Nelson's antelope squirrel through harm and harassment. Implementation of the minimization and avoidance measures will prevent take from occurring on the Conservation Sites and Movement Corridors.

Direct Effects

During the pre-construction phase for each solar facility development, the Solar Development Footprints will be graded and compacted to prepare the land for construction. Land grading and compacting will eliminate 3,798.2 acres of potential foraging habitat for Nelson's antelope squirrel. Complete build-out of the Maricopa Sun Solar Complex will be phased over 10-15 years and take of Nelson's antelope squirrel potential foraging habitat will be concurrent with the development of each solar facility. Take of potential foraging habitat could lead to harm of the Nelson's antelope squirrel by limiting the species ability to obtain food.

In addition to grading and compacting, some other Covered Activities include the use of heavy equipment that will result in ground disturbance. These activities will generate ground vibrations and high noise levels. Ground disturbing activities could result in take of Nelson's antelope squirrel in the form of harm and harassment. Covered Activities with the potential to harm and harass Nelson's antelope squirrel include: geotechnical drilling and testing; establishing staging areas and access roads; delivery and distribution of building materials and equipment; drainage and erosion control; testing, plugging, and abandoning oil wells; construction of operations and

maintenance buildings and solar arrays; construction of transmission lines; paving of access roads and driveways; cleaning of the solar arrays during the operations and maintenance phase; removal of all solar arrays, operations and maintenance buildings, staging areas, and access roads during the decommissioning phase; mechanical and chemical vegetation/weed control; and carrying out the enhancement and management measures on conservation lands.

The potential for take as a result of high noise levels is not anticipated to occur due to the lack of presence of the species within 0.5 miles of any solar development. If the species become present closer to or within the Solar Sites over the life of the Project, adverse effects could occur in areas where the Nelson's antelope squirrel becomes present. The risk of take of Nelson's antelope squirrel due to noise will be commensurate with the occurrence of the species on or adjacent to the Solar Development Footprint. Nelson's antelope squirrels will use artificial burrow-like structures such as culverts, pipes, pallets, wire bales, and construction equipment that will be staged throughout the Solar Development Footprints and the species could be exposed to take in the event that materials and equipment are moved or buried while occupied. Delivery of materials and equipment will generate high vehicle traffic levels and hazardous and non-hazardous waste materials can be generated any time construction crews are present. Nelson's antelope squirrels are active during the day, and consequently would be exposed during peak activity hours.

The Nelson's antelope squirrel does not currently occur within half a mile of the Project sites, but is anticipated to become more abundant over the course of the Project operational period. Maintenance and repairs to the solar facilities and activities conducted during decommissioning may result in the need to capture the Nelson's antelope squirrel. The need to capture and relocate animals will be predicated on animal occurrences and the degree of ground disturbing repairs that would be needed. There is an expectation that the Nelson's antelope squirrel may become established on the sites and can persist concurrently with solar development, but there would be a lag between the cessation of disking and occupation of the solar sites. Even after the sites become occupied, the density of the Nelson's antelope squirrel would be expected to be commensurate with poor quality habitat, with the species being present at an average density of one animal per acre over the 3,798.2 acres of the project site.

Although the recolonization of the Project sites cannot be determined with certainty, estimates of the number of Nelson's antelope squirrels that would potentially need to be relocated can be estimated by making some informed assumptions. Those assumptions are:

1. That the Nelson's antelope squirrel would become present on all Solar Sites at an abundance representative of low quality habitat. Estimates of population density of 1 – 4 individuals per acre have been documented for this species (Williams 1980). There currently is a lack of Nelson's antelope squirrels and a lack of habitat that would support Nelson's antelope squirrels on the project sites due to recurring disking.
2. That ground disturbing repair and maintenance activities would be limited to 1% (37.98 acres) of the solar project lands per year,

Given these assumptions, a total of approximately 38 Nelson's antelope squirrels would need to be captured per year (37.9 acres x one animal per acre), with fewer animals captured during the initial 5 to 10 years of the project (due to a delay in occupation as well as inherent delays in solar development caused by "phasing" of the development). Given these assumptions, this would equate to a maximum estimate of 1,200 Nelson's antelope squirrels captured over the 35 year term of the project during operations and maintenance of the solar sites.

There would be a high degree of ground disturbing activities that would need to occur during decommissioning because of the removal of foundations, buildings, solar panel supports, and other components. Assumptions used to determine the number of Nelson's antelope squirrels that would need to be captured during decommissioning are:

1. That the Nelson's antelope squirrel would be widespread over the project sites by the time decommissioning activities would commence,
2. The density of antelope squirrels would remain at low levels (one per acre).
3. That approximately half of the site acreage would be disturbed during decommissioning.

Given these assumptions, it is estimated that up to approximately 1,900 Nelson's antelope squirrels (3,798.2 acres x 0.5 x 1.0 animals per acre = 1,899 animals) would need to be captured prior to and during decommissioning. Thus, during both operations and maintenance and during decommissioning, an estimated 3,100 Nelson's antelope squirrels would need to be captured..

General and species-specific minimization, avoidance, and mitigation measures will be implemented as part of the project to reduce the impact of Covered Activities and the potential for take of the Nelson's antelope squirrel (Chapter 2, Section 2.3.5). Pre-activity surveys will be conducted to determine the location of Nelson's antelope squirrel occupied habitat and the location of all Nelson's antelope squirrel burrows (GM-1, TNM-1). All employees that will be working on site will be required to attend the EEP training to learn the minimization, avoidance, and mitigation measures and to learn how to identify and avoid Nelson's antelope squirrel (GM-2). The impact on Nelson's antelope squirrel from grading and compacting the Solar Sites will be minimized by erecting barrier fencing along project boundaries adjacent to known occupied habitat to buffer the species from ground disturbance and noise (GM-10). Vehicle speed limits will be maintained at 10 miles per hour or less on the project site at all times and vehicles will be limited to designated traffic areas (GM-4). Biological monitors will be present to ensure that Covered Species are avoided by work crews and that remedial actions are taken as soon as possible to deal with all identified potential risks [e.g., ensure appropriate spacing of staged materials (GM-7), that all staged materials are covered (GM-8), and ensure no trash remains on site at the end of the work day (GM-9)].

In the event that work must take place in an area that contains Nelson's antelope squirrel burrows, agency consultation will be sought and measures outlined in the relocation plan (Appendix F) will be implemented to safely exclude Nelson's antelope squirrels from the work area and reduce Project impacts. Nelson's antelope squirrel would be exposed to non-lethal take (capture) while conducting agency approved relocation.

Indirect Effects

Paving of roads and building areas and construction of drainages along roads and other paved areas could change soil moisture and chemistry in localized areas. Changes in soil moisture and chemistry could result in changes in plant distributions and species composition and could change the local plant community that Covered Species rely upon. This indirect effect would occur during the operations and maintenance phase on the Solar Sites and throughout the conservation lands once disking ceases and enhancement and management has begun. Soil moisture might affect vegetation in a beneficial way (cessation of disking and additional water would support more vegetation), or in an adverse way (additional water may encourage non-native “weedy” plants or a vegetation density greater than that preferred by Covered Species). A change in vegetation could adversely affect the Nelson’s antelope squirrel, but mitigation measures that manage and restore vegetation (Chapter 5; Appendix C) would limit the amount of harmful vegetation and reduce unsuitable vegetation density resulting in overall benefits for the Nelson’s antelope squirrel through improved habitat conditions. Therefore, it is anticipated that paving of roads and building areas, and construction of drainages along roads and other paved areas, will not adversely affect the Nelson’s antelope squirrel.

Predation by snakes, coyotes, red foxes, San Joaquin kit fox, and birds of prey could increase within the Permit Area as the Nelson’s antelope squirrel population increases. Increased predation concomitant with an increase in abundance would be considered an overall improvement in the functionality of the ecosystem and a direct result of improved conditions for the Nelson’s antelope squirrel population.

Effects of Take

Implementation of this HCP will have no adverse effects on the local population of Nelson’s antelope squirrel, will not interfere with the continued existence of the species as a whole, nor is it anticipated to result in a jeopardy opinion on the part of the USFWS. Nelson’s antelope squirrel does not currently occur on the Solar Sites and routine disking prevents the existence of any Nelson’s antelope squirrel habitat on the Solar Sites. The project location falls outside of the core western Kern County Nelson’s antelope squirrel population area and will not interfere with conservation activities undertaken in that area.

Implementation of this HCP will directly support the goals of the Recovery Plan for Upland Species of the San Joaquin Valley (Recovery Plan) by converting agricultural lands back into native lands that will be managed for the benefit of Nelson’s antelope squirrel. The project location falls just to the east of the core western Kern County population of Nelson’s antelope squirrel and will ultimately contribute 5,692.6 acres of habitat that could potentially be occupied by this species and that would be protected in perpetuity. Nelson’s antelope squirrel is known to occur on Site 9-C and to the north and west of Site 1-C. It is likely that populations of this species will expand into conservation sites, thus this HCP would provide overall benefits to this species.

4.2.4 WESTERN BURROWING OWL

The western burrowing owl has been observed perched on some of the Solar Sites, but no available burrowing habitat occurs on any of the Solar Sites (see Chapter 3, Table 3-6 and Section 3.3.2 and Appendix B for detailed occurrence information). Nine individual western burrowing owls were observed across three Solar Sites (3-S, 6-S, and 7-S) suggesting that the species could be foraging on lands that will be developed for the solar project. Western burrowing owls were also observed on Conservation Sites 3-C2 and 9-C, and adjacent to Solar Sites 2-S, 5-S and 15-S and Conservation Sites 1-C, 3-C, and 10C.

The lack of available habitat for burrowing and breeding and the lack of habitat to support prey species indicates that the western burrowing owl is only passively using the Solar Sites, perhaps during foraging forays on adjacent lands. Direct lethal take of western burrowing owls will be avoided during Covered Activities by implementation of the minimization and avoidance measure (see all measures outlined in Chapter 2, Section 2.3.5). Covered Activities could result in direct effects to the western burrowing owl and the species could be subject to take in the form of harm and harassment. The total land area that will be impacted by the Project and where the western burrowing owl could be subject to direct effects is 3,798.2 acres, which includes all of the Solar Sites. Implementation of the minimization and avoidance measures will prevent take from occurring on the Conservation Sites or within the Movement Corridors.

Direct Effects

During the pre-construction phase for each solar facility development, the Solar Development Footprints will be graded and compacted to prepare the land for construction. Land grading and compacting will eliminate 3,798.2 acres of potential foraging habitat for western burrowing owls. Complete build-out of the Maricopa Sun Solar Complex will be phased over 10-15 years and take of western burrowing owl potential foraging habitat will be concurrent with the development of each solar facility. Take of potential foraging habitat could lead to harm of the western burrowing owl by limiting the species ability to obtain food.

In addition to grading and compacting, some other Covered Activities include the use of heavy equipment that result in ground disturbance. These activities will generate ground vibrations and high noise levels. Ground disturbing activities could result in take of western burrowing owl in the form of harm and harassment. Covered Activities with the potential to harm and harass western burrowing owls include: geotechnical drilling and testing; establishing staging areas and access roads; delivery and distribution of building materials and equipment; drainage and erosion control; testing, plugging, and abandoning oil wells; construction of operations and maintenance buildings and solar arrays; construction of transmission lines; paving of access roads and driveways; cleaning of the solar arrays during the operations and maintenance phase; removal of all solar arrays, operations and maintenance buildings, staging areas, and access roads during the decommissioning phase; mechanical and chemical vegetation/weed control; and carrying out enhancement measures on the conservation lands.

Western burrowing owls may seek shelter in artificial burrow-like structures such as culverts, pipes, pallets, wire bales, and construction equipment that will be staged throughout the Solar

Development Footprints and the species could be exposed to take in the event that materials or equipment are moved or buried while occupied. Delivery of materials and equipment will generate high vehicle traffic levels and hazardous and non-hazardous waste materials can be generated any time construction crews are present. Western burrowing owls are active during the day and consequently would be exposed during peak activity hours.

General and species-specific minimization, avoidance, and mitigation measures will be implemented as part of the project to reduce the impact of Covered Activities and the potential for take of western burrowing owls (Chapter 2, Section 2.3.5). Pre-activity surveys will be conducted to determine the location of western burrowing owl occupied habitat and the location of all active western burrowing owl burrows (GM-1, WEBO-1). The risk of take of western burrowing owls as a result of Covered Activities will be minimized by erecting ESA barrier fencing along Project boundaries adjacent to known occupied habitat to buffer the species from Covered Activities (WEBO-2). All employees that will be working on site will be required to attend the EEP training to learn the minimization, avoidance, and mitigation measures and to learn how to identify and avoid western burrowing owls (GM-2). Vehicle speed limits will be maintained at 10 miles per hour or less on the project at all times and vehicles will be limited to designated traffic areas (GM-4). Biological monitors will be present to ensure that western burrowing owls are avoided by work crews and that remedial actions are take as soon as possible to deal with all identified potential risks (e.g., ensure appropriate spacing of staged materials [GM-7], that all staged materials are covered [GM-8], and ensure no trash remains on site at the end of the work day [GM-9]).

In the event that work must take place in an area that contains western burrowing owl burrows, agency consultation will be sought and measures outlined in the relocation plan (Appendix E) will be implemented to safely exclude western burrowing owls from the work area. Western burrowing owls will be exposed to non-lethal take while conducting agency approved relocation.

Indirect Effects

Paving of roads and building areas and construction of drainages along roads and other paved areas could change soil moisture and chemistry in localized areas. Changes in soil moisture and chemistry could result in changes in plant distributions and species composition and could change the local plant community that Covered Species rely upon. This indirect effect would occur during the operations and maintenance phase on the Solar Sites and throughout the conservation lands once disking ceases and enhancement and management has begun. Soil moisture might affect vegetation in a beneficial way (cessation of disking and additional water would support more vegetation), or in an adverse way (additional water may encourage non-native “weedy” plants or a vegetation density greater than that preferred by Covered Species). A change in vegetation could adversely affect the burrowing owl, but mitigation measures that manage and restore vegetation (Chapter 5; Appendix C) would limit the amount of harmful vegetation and reduce unsuitable vegetation density resulting in overall benefits for the burrowing owl through improved habitat conditions. Therefore, it is anticipated that paving of roads and building areas, and construction of drainages along roads and other paved areas, will not adversely affect the burrowing owl.

Predation by snakes, coyotes, red foxes, San Joaquin kit fox, and birds of prey could increase within the Permit Area as the western burrowing owl population increases. Increased predation concomitant with an increase in abundance of burrowing owls would be considered an overall improvement in the functionality of the ecosystem and a direct result of improved conditions for the burrowing owl population.

Effects of Take

Implementation of this HCP will have no substantial adverse effects on the local population of western burrowing owls. The Solar Sites do not contain breeding owls, there are few foraging opportunities for owls on the Solar Sites, and only a few owls were observed to be utilizing the Solar Sites. The installation of solar facilities on these lands may temporarily displace some foraging burrowing owls, but habitat conditions favorable to supporting a greater number of burrowing owls may develop on the sites once the facilities are installed, thus potentially providing an increase in the number of owls on site. Even if this does not occur, the conservation easements on 1,894.4 acres of Conservation Sites will contribute to the preservation of the local population of burrowing owls, as will the conservation of 3,798.2 acres of the Solar Sites upon decommissioning.

Implementation of this HCP will not jeopardize the continued existence of the western burrowing owl. This species ranges widely in the western hemisphere of North America and the effects to this species from the project are not only insignificant to the local population, but they are insignificant to the species as a whole.

Implementation of this HCP will not preclude the recovery of the species and, in fact, will directly support recovery of the western burrowing owl by providing both foraging and breeding habitat on lands reclaimed from agricultural use. Western burrowing owls were detected on Conservation Sites 3-C2 (152.9 acres) and 9-C (180.6 acres) that will be placed into conservation easements during the life of the project. A total of 1,894.4 acres of conservation easement, to be protected in perpetuity, will be established during the 35 year life of the project. To allow for western burrowing owls to escape flooding, 42.05 acres of topographic relief will be provided on the conservation easements. Once the solar project has been decommissioned an additional 3,798.2 acres of habitat will be available and managed for western burrowing owl habitat. These large blocks of land along with extant areas of habitat adjacent to the Solar and Conservation Sites provide an expansive area of western burrowing owl habitat suitable for the growth of the local population and for the increase and preservation of the genetic pool in the region.

4.2.5 BLUNT-NOSED LEOPARD LIZARD

The blunt-nosed leopard lizard is not currently using the Solar Sites for burrowing or breeding habitat and the current disked conditions of the Project Sites do not support habitat for the species. During protocol level surveys, blunt-nosed leopard lizards were observed on lands adjacent to Solar Sites 2-S and 3-S, and Conservation Sites 3-C, 3-C2. Historical records exist on lands adjacent to site 17-C and the species could occur on site now due the presence of native habitat (see Chapter 3, Table 3-6 and Section 3.3.2 and Appendix B for detailed occurrence information).

The proximity of blunt-nosed leopard lizards to the Solar Sites suggests that the species could potentially forage onto the Solar Sites once disking ceases and at that time could be at risk from Covered Activities. Direct lethal take of blunt-nosed leopard lizard individuals will be avoided during Covered Activities by implementation of the minimization and avoidance measures (see all measures outlined in Chapter 2, Section 2.3.5), and due to the low abundance of the species within the Permit Area. Development of the Solar Sites will result in the loss of 3,798.2 acres of potential foraging habitat and could result in take of blunt-nosed leopard lizards through harm and harassment. Implementation of the minimization and avoidance measures will prevent take from occurring on the Conservation Sites and Movement Corridors.

Direct Effects

During the pre-construction phase for each solar facility development, the Solar Development Footprints will be graded and compacted to prepare the land for construction. Land grading and compacting will eliminate 3,798.2 acres of potential foraging habitat for blunt-nosed leopard lizard. Complete build-out of the Maricopa Sun Solar Complex will be phased over 10-15 years and take of blunt-nosed leopard lizard potential foraging habitat will be concurrent with the development of each solar facility. Site grading and compaction and barrier fencing could result in take of potential foraging habitat and could lead to harm of the blunt-nosed leopard lizard by limiting the species ability to obtain food.

In addition to grading and compacting, some other Covered Activities include the use of heavy equipment that will result in ground disturbance. These activities will generate ground vibrations and high noise levels. Ground-disturbing activities could result in take of blunt-nosed leopard lizard in the form of harm and harassment. Covered Activities with the potential to harm and harass blunt-nosed leopard lizard include: geotechnical drilling and testing; establishing staging areas and access roads; delivery and distribution of building materials and equipment; drainage and erosion control; testing, plugging, and abandoning oil wells; construction of operations and maintenance buildings and solar arrays; construction of transmission lines; paving of access roads and driveways; cleaning of the solar arrays during the operations and maintenance phase; removal of all solar arrays, operations and maintenance buildings, staging areas, and access roads during the decommissioning phase; mechanical and chemical vegetation/weed control; and carrying out the enhancement and management measures on conservation lands.

Blunt-nosed leopard lizard will use artificial burrow-like structures such as culverts, pipes, pallets, wire bales, and construction equipment that will be staged throughout the Solar

Development Footprints and the species could be exposed to take in the event that materials and equipment are moved or buried while occupied. Delivery of materials and equipment will generate high vehicle traffic levels and hazardous and non-hazardous waste materials can be generated any time construction crews are present. Blunt-nosed leopard lizards are active during the day and consequently will be exposed during peak activity hours.

General and species-specific minimization, avoidance, and mitigation measures will be implemented as part of the project to reduce the potential for take of blunt-nosed leopard lizard (Chapter 2, Section 2.3.5). Pre-activity surveys will be conducted to determine the location of blunt-nosed leopard lizard occupied habitat and the location of all blunt-nosed leopard lizard burrows (GM-1, BNLL-3). Impermeable barrier fencing will be installed along the project boundary between Solar Sites 2-S and 3-S and adjacent native habitat where blunt-nosed leopard lizards are known to occur (GM-10, BNLL-1). All employees that will be working on site will be required to attend the EEP training to learn the minimization, avoidance, and mitigation measures and to learn how to identify and avoid blunt-nosed leopard lizards (GM-2). Vehicle speed limits will be maintained at 10 miles per hour or less on the project at all times and vehicles will be limited to designated traffic areas (GM-4). In areas known to be occupied by blunt-nosed leopard lizards, the speed limit will be reduced to 5 miles per hour (BNLL-4). Biological monitors will be present during construction activities to ensure that blunt-nosed leopard lizards are avoided by work crews and that remedial actions are take as soon as possible to deal with all identified potential risks [e.g., ensure appropriate spacing of staged materials (GM-7), that all staged materials are covered (GM-8), and ensure no trash remains on site at the end of the work day (GM-9)].

Indirect Effects

Paving of roads and building areas and construction of drainages along roads and other paved areas could change soil moisture and chemistry in localized areas. Changes in soil moisture and chemistry could result in changes in plant distributions and species composition and could change the local plant community Covered Species rely upon. This indirect effect would occur during the operations and maintenance phase on the Solar Sites and throughout the conservation lands once disking ceases and enhancement management has begun. Soil moisture might affect vegetation in a beneficial way (cessation of disking and additional water would support more vegetation), or in an adverse way (additional water may encourage non-native “weedy” plants or a vegetation density greater than that preferred by Covered Species). A change in vegetation could adversely affect the blunt-nosed leopard lizard, but mitigation measures that manage and restore vegetation (Chapter 5; Appendix C) would limit the amount of harmful vegetation and reduce unsuitable vegetation density resulting in overall benefits for the blunt-nosed leopard lizard through improved habitat conditions. Therefore, it is anticipated that paving of roads and building areas, and construction of drainages along roads and other paved areas, will not adversely affect the blunt-nosed leopard lizard.

Predation by snakes, San Joaquin kit fox, birds of prey, and other blunt-nosed leopard lizards could increase within the Permit Area as the blunt-nosed leopard lizard population increases. Increased predation concomitant with an increase in abundance of blunt-nosed leopard lizards

would be considered an overall improvement in the functionality of the ecosystem and a direct result of improved conditions for the leopard lizard population.

Effects of Take

Implementation of this HCP will have no adverse effects on the local population of blunt-nosed leopard lizards. The blunt-nosed leopard lizard does not currently exist on the proposed Solar Sites; only on habitat that occurs adjacent to some of the Sites. Barrier fencing and other protective measures are incorporated into the project to assure that that blunt-nosed leopard lizards occurring in these adjacent areas will not be subject to direct mortality. However, the development of the solar facilities will result in the loss of 3,798.2 acres of potential foraging habitat. Because the Solar Sites are currently disked and provide no small mammal burrows as refugia and do not contain a vegetation community capable of supporting an abundance of prey, the value of these areas to the blunt-nosed leopard lizard is minimal.

Implementation of the HCP will not jeopardize the continued existence of the blunt-nosed leopard lizard. The proposed Solar Sites and conservation lands are localized, and will have no effect on the extensive blunt-nosed leopard lizard populations that occur in other areas such as at Elk Hills and the Carrizo plains to the west of the project, and in the Pixley National Wildlife refuge, Kettleman Hills, and Panoche Valley to the north of the project.

Implementation of this HCP will not preclude the recovery of the blunt-nosed leopard lizard and, in fact, this HCP directly supports the goals of the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) by converting agricultural lands back into native lands that will be managed for the benefit of the blunt-nosed leopard lizard. The recordation of conservation easements on 5,692.6 acres of conservation land will provide habitat for the existing population of blunt-nosed leopard lizards that will be protected in perpetuity. The preservation and management of the conservation lands will reduce habitat fragmentation created by disking of agricultural fields and will provide habitat away from roads where a large proportion of blunt-nosed leopard lizard mortality occurs. Biological monitoring of the conservation plan will achieve another goal of the Recovery Plan by providing information on the recovery of blunt-nosed leopard lizards in reclaimed lands and tracking of the blunt-nosed leopard lizard population in the Permit Area. .

4.3 Summary of Potential Take

Covered Activities relating to the development of the Maricopa Sun Solar Project will result in take of Covered Species. Adverse effects include the loss of potential habitat and dispersal habitat, potential harm and harassment of individuals of covered species from activities associated with ground disturbance, noise, vehicle use, hazardous and non-hazardous material use and den collapse for passive relocation, and capture during trapping for small mammal relocation. The potential for adverse effects to occur depends on the project phase and the presence of Covered Species during that phase. Covered Species might become more abundant during the operations and maintenance phase as a result of improved habitat conditions. The project description incorporates measures to minimize and avoid adverse effects to Covered Species, including the use of avoidance barrier fencing to separate Covered Species from project

related activities, maintaining a speed limit of 10 miles per hour for all on-site vehicles, limiting vehicle use to access roads and staging areas, and implementing relocation plans (Appendices E and F) in the event that occupied burrows are unavoidable. The values for acreages that will be subject to adverse effects provided in Table 4-1 and in the above text represent maximum acreages of potential take for the given activity and are not cumulative from one activity to another. Direct lethal take of individuals of Covered Species is not anticipated, but the potential for mortalities to occur is commensurate with species abundance, which may increase over the life of the solar project. Increasing the abundance of Covered Species in the Permit Area is a goal of the Conservation Plan (Chapter 5) and any consequential increase in risk is ameliorated by the mitigation measures designed to avoid and protect Covered Species during all phases of the project.

4.4 Non-covered Species and Justification for No Coverage

Species that will not be covered by this HCP and justification that no take will occur are discussed in Appendix I. Those species for which no coverage is being sought are the San Joaquin woolly threads, the Kern mallow, the giant kangaroo rat and the Buena Vista lake shrew. The only habitat adjacent to the project sites that could support rare plant species is to the east of Solar Site 2-S and west of Solar Site 3-S. These areas were surveyed a minimum of 17 times during blunt-nosed leopard lizard surveys. Most of these surveys were conducted during periods when these plant species would have been identifiable, but no rare plant species were detected. The project description incorporates dust control measures and potential adverse effects of fugitive dust on any rare plants in the vicinity of the project sites will be insignificant. Take of other listed wildlife species is not anticipated to occur because of their absence from the Permit Area. No direct or indirect adverse effects will occur to non-covered species.

5.0

CONSERVATION PROGRAM

5.0 CONSERVATION PROGRAM

5.1 *Biological Goals and Objectives*

Section 10(a)(2)(A) of the Endangered Species Act requires that an HCP specify the measures that the permittee will take to minimize and mitigate to the maximum extent practicable the impacts of the taking of any federally listed animal species as a result of activities addressed by the plan. As part of the “Five Point” Policy adopted by the USFWS in 2000, HCPs must also establish biological goals and objectives (65 FR 35242) to ensure that the operating conservation program in the HCP is consistent with the conservation and recovery goals established for the species. These goals are developed based upon the species’ biology, threats to the species, the potential effects of the Covered Activities, and the scope of the HCP. The five-point policy also requires that monitoring be conducted to determine the effects of the HCP on the Covered Species, and the effectiveness of the HCP in minimizing and mitigating the adverse effects on the species; and to determine if compliance with the terms and conditions of the HCP are being met. This Chapter defines the MSHCP’s goals and objectives and identifies actions that will be taken to meet those goals and objectives. Chapter 6 describes the monitoring efforts that will be conducted, and describes performance and success criteria.

Biological goals and objectives are defined by the USFWS (65 FR 35242) as:

- Biological goals are “the broad guiding principles for the operating conservation program; they are the rationale behind the minimization and mitigation strategies”;
- Biological objectives are “the measurable targets for achieving the biological goals”.

The goals and objectives developed for each of the Covered Species are similar, as are the rationale for their importance as part of the conservation strategy. The Project’s primary biological goals are to preserve Covered Species and provide Covered Species habitat within the Permit Area by:

1. Increasing the ability of San Joaquin kit fox to disperse through the Permit Area and providing habitat within the region;
2. Preserving existing populations of the Tipton kangaroo rat within the Permit Area and, providing habitat for the Tipton kangaroo rat within the Permit Area;
3. Preserving existing populations of the Nelson’s antelope squirrel within the Permit Area and providing habitat for the Nelson’s antelope squirrel within the Permit Area
4. Preserving existing populations of the western burrowing owl within the Permit Area and, providing habitat for the western burrowing owl within the Permit Area
5. Providing habitat for the blunt-nosed leopard lizard within the Permit Area.

5.2 *Species Specific Goals and Objectives*

5.2.1 SAN JOAQUIN KIT FOX

Goals

The primary goals for the San Joaquin kit fox are to:

1. Minimize the impact of the Project on the ability of San Joaquin kit fox to disperse through the Permit Area and region; and
2. Provide habitat within the Permit Area.

Measurable Objectives

The measurable objectives to support meeting the above goals are:

1. Provide permeable perimeter security fencing around each of the seven Solar Sites that will allow the San Joaquin kit fox to move onto and through the solar development areas. A total of approximately 165,273 linear feet of permeable security fencing will be installed (also see Chapter 2, Section 2.3.1, Table 2-3 and Figure 2-3).
2. Provide Movement Corridors in strategic locations that abut four Solar Sites to facilitate the movement of San Joaquin kit foxes within and among the Solar Sites.
 - Four Movement Corridors, each 50 feet wide, will be placed along Solar Sites 2-S, 3-S, 4-S, and 7-S (designated as Movement Corridors 2-M, 3-M, 4-M, and 7-M; see Appendix B). These Movement Corridors total 33.8 acres (also see Chapter 2, Section 2.2, Table 2-1 and Figure 2-1). These Movement Corridors are currently in a disked state and provide little habitat value for foxes because of a lack of vegetation, a lack of prey availability, and a lack of escape cover. The lack of escape cover reduces the potential for foxes to avoid predation and successfully move across these lands.
 - The Movement Corridors will be enhanced to provide habitat for the San Joaquin kit fox by installing 44 artificial kit fox dens within the four Movement Corridors (10 per linear mile) as escape cover. One in ten dens will be of a natal den (or pupping den) design, while the remainder will be of the more simple escape den design. The artificial dens will be constructed following standardized configurations (Appendix D); i.e., simple artificial dens will be constructed with a main chamber and two associated entrance culverts that provide access to the surface. The natal artificial den will be constructed with a main chamber, secondary chambers, and several associated entrance culverts that provide access to the surface.
 - Habitat within the Movement Corridors will be enhanced by providing vegetation and topographic relief as described in Section 5.3, below, and in Appendix C.

3. Provide San Joaquin kit fox dispersal habitat near the Solar Sites and in the Permit Area, and enhance the dispersal habitat to facilitate kit fox movements.
 - Conservation Sites 1-C, 3-C, and 3-C2 are situated near and among six of the seven Solar Sites and will provide a total of 889.9 acres of dispersal habitat (1-C = 656.6 acres, 3-C = 80.4 acres, and 3-C2 = 152.9 acres) around the developed Solar Sites (also see Chapter 2, Section 2.2, Table 2-1, and Figure 2-2).
 - Additional dispersal habitat will be provided in strategic areas within the region, including near an existing San Joaquin kit fox movement corridor located along the California Aqueduct easement, and near the Wind Wolves Preserve near the Transverse Range, south of the Project. The Wind Wolves Preserve and surrounding lands are located within an east-west linkage corridor (see Appendix H) that is identified as essential to the recovery of the San Joaquin kit fox in the recovery plan for this species (USFWS 1998, 2010). The conservation lands along the California Aqueduct will enlarge that corridor by 356.8 acres (9-C = 180.6 acres and 10-C = 176.2 acres), and the conservation lands along the southern east-west linkage corridor along the Transverse Range will provide 647.7 acres of San Joaquin kit fox dispersal habitat (Site 17-C). Thus a total of 1,894.4 acres of dispersal habitat will be provided during the operational period of the solar project (also see Chapter 2, Section 2.2, Table 2-1; and Section 2.3 and Figure 2-2).
 - Enhancements to these lands will include installing 96 artificial kit fox dens (one per 20 acres within the 1,894.4 acres of Conservation Sites) that can be used by foxes. The dens will provide escape cover and reduce the potential for predation on dispersing San Joaquin kit foxes. One in ten dens will be of a natal den (or pupping den) design, while the remainder will be of the more simple escape den design. The artificial dens shall be constructed following standardized configurations (Appendix D); i.e., simple artificial dens will be constructed with a main chamber and two associated entrance culverts that provide access to the surface. The artificial natal den will be constructed with a main chamber, secondary chambers, and several associated entrance culverts that provide access to the surface.
 - Prior to the start of construction, conservation easements shall be recorded on the Solar Sites, and upon decommissioning of the Project, the Solar Sites will be managed in perpetuity for the benefit of Covered Species, resulting in a total of 5,692.6 acres of land that will be conserved in perpetuity and contribute to San Joaquin kit fox dispersal. The enhancement and management of these lands are presented in Sections 5.3 and 5.4, below, and in Appendix C.
4. Provide habitat to increase the likelihood of the San Joaquin kit fox breeding within the Permit Area.
 - A total of 1,894.4 acres of habitat that is or will become suitable to support breeding populations of the San Joaquin kit fox will be provided during the construction and operations and maintenance phases of the project. Two of the Conservation Sites totaling

approximately 828.3 acres provide existing lands that are suitable to support breeding of San Joaquin kit fox (Sites 9-C = 180.6 acres and 17-C = 647.7 acres). Both of these Conservation Sites are located contiguous to lands that are known to support San Joaquin kit foxes. The remaining Conservation Sites, totaling 1,066.1 acres, are not currently suitable for breeding San Joaquin kit foxes. These lands will be enhanced to increase their value to the San Joaquin kit fox and foster breeding during the operations and maintenance phase of the Project. Enhancements to these lands will include installing 96 artificial kit fox dens (one per 20 acres within the 1,894.4 acres of Conservation Sites) that can be used by foxes. Vegetation will be restored by the cessation of disking and by planting naturalized vegetation to increase prey availability and provide cover. The enhancement and management of these lands are presented in Sections 5.3 and 5.4, below, and in Appendix C. Upon decommissioning of the Solar Sites, conservation acreage would be increased to 5,692.6 acres. This acreage will be conserved in perpetuity, and enhanced and managed for the San Joaquin kit fox.

Success Criteria

- Having established 165,273 linear feet of permeable fencing around conservation easements to protect the land in perpetuity.
- Having established Movement Corridors for the benefit of San Joaquin kit fox on 33.8 acres of land and 44 artificial dens within the Movements Corridors.
- Having established conservation easements for the benefit of San Joaquin kit fox on 1,894.4 acres of land, prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established conservation easements for the benefit of San Joaquin kit fox on a total of 5,692.6 acres of land within the Maricopa Sun Solar Complex.

5.2.2 TIPTON KANGAROO RAT

Goals

The primary goals for the Tipton kangaroo rat are to:

1. Preserve existing populations of the Tipton kangaroo rat within the Permit Area; and
2. Provide habitat for the Tipton kangaroo rat within the Permit Area.

Measurable Objectives

The measurable objectives to support meeting the above goals are:

1. Preserve existing populations of the Tipton kangaroo rat within the Permit Area.

- The Tipton kangaroo rat is known to occur on a total of 837.2 acres of land within the Permit Area (1-C = 656.5 acres and 9-C = 180.6 acres, occupied Tipton kangaroo rat habitat). These lands will be placed into a conservation easement and managed in perpetuity for this species. Management of these lands is provided in Appendix C.

2. Provide habitat for Tipton kangaroo rats within the Permit Area.

- The Tipton kangaroo rat currently exists on 837.2 acres of land within the Permit Area. These lands will not be impacted by the project, and will be set aside and managed in perpetuity for this species. Additional lands totaling 233.3 acres of Permit Area lands (Site 3-C = 80.4 acres, Site 3-C2 = 152.9 acres) are within the range of the Tipton kangaroo rat and have the potential to be occupied by this species. Enhancements will occur on these lands to increase the lands' suitability to support the Tipton kangaroo rat within the Permit Area. Habitat will be restored by the cessation of disking and, if needed, planting naturalized vegetation. The enhancement and management of these lands are presented in Sections 5.3 and 5.4 below and in Appendix C.
- Prior to the start of construction, conservation easements shall be recorded on the Solar Sites, and upon decommissioning, all Solar Sites, totaling 3,798.2 acres, will be managed in perpetuity for the Tipton kangaroo rat. Thus, the Project will result in a total of 4,868.7 acres of habitat being placed into conservation easements and managed in perpetuity for this species.
- Portions of Conservation Site 1-C, all of Site 3-C, and all of Site 3-C2 are within a flood-prone area (Figure 10 in Appendix G). Topographic relief will be created on sites 1-C, 3-C, and 3-C2 to increase the potential for these sites to support Covered Species, including the Tipton kangaroo rat, during periods of flooding.
- Topographic relief will be created within the 187.6 acres of flood prone area of Site 1-C and on the 80.4 acres of Sites 3-C at a rate of 10 percent coverage. This will result in a total disturbance area of 26.8 acres. The topographic relief will consist of shallow depressions, approximately one foot deep, and areas that will be elevated approximately six inches above grade to provide refugia for small mammals during periods of flooding and create burrowing opportunities.

Topographic relief will be created on Conservation Site 3-C2. However, because a large portion of this site is exhibiting substantial vegetative recovery after the cessation of disking several years ago, judicious placement of relief will be necessary to avoid undue disturbance. Topographic relief placement will avoid small mammal burrows, burrowing owl burrows, and diversely vegetated areas. Areas that will be enhanced with topographic relief are large patches of bare ground and areas of vegetation that support very few species, which are weedy (e.g., large expanses of this site support only London rocket). A total of 15.3 acres of topographic relief will be installed within Site 3-C2.

Topographic relief on all 42.1 acres will be created using scrapers, loaders, or other heavy equipment. All installations of relief will be monitored by the Project lead biologist to ensure that all sensitive biological resources are avoided.

No topographic relief will be created within Site 17-C or the lower portion of Site 9-C, which, having never been actively farmed or tilled, are both in a relatively natural state with native vegetation. The installation of topographic relief would cause unnecessary disturbance to existing habitat.

Success Criteria

- Having preserved 837.2 acres of currently occupied lands as conservation easements for the benefit of Tipton kangaroo rats prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established conservation easements for the benefit of Tipton kangaroo rats on 233.3 acres of currently unoccupied lands, prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established a total of 4,868.7 acres of conservation easements for the benefit of Tipton kangaroo rats within the Maricopa Sun Solar Complex.
- Having established 42.1 acres of topographic relief on flood prone lands within one year of establishing a conservation easement.

5.2.3 NELSON'S ANTELOPE SQUIRREL

Goals

The primary goals for the Nelson’s antelope squirrel are to:

1. Preserve existing populations of the Nelson’s antelope squirrel within the Permit Area; and
2. Provide habitat for the Nelson’s antelope squirrel within the Permit Area.

Measurable Objectives

The measurable objectives to support meeting the above goals are:

1. Preserve existing populations of the Nelson’s antelope squirrel within the Permit Area.
 - The Nelson’s antelope squirrel is known to occur within the Permit Area only on Conservation Site 9-C (180.6 acres), which contains saltbush scrub habitat. These lands will be placed into a conservation easement and managed in perpetuity for this species. The enhancement and management of these lands are summarized in Section 5.3 and 5.4 below and in Appendix C.

2. Provide habitat for Nelson’s antelope squirrel within the Permit Area.

- The Nelson’s antelope squirrel was observed adjacent to Conservation Sites 1-C (656.6 acres), and 10-C (176.2 acres), and may also be present on Site 17-C (647.7 acres), although the latter has not been confirmed. These lands, totaling 1,480.5 acres, will not be impacted by the project and will be set aside and managed in perpetuity for this species.
- Additional lands totaling 233.3 acres (Site 3-C = 80.4 acres and Site 3-C2 = 152.9 acres) are within the range of the Nelson’s antelope squirrel and have the potential to be occupied by this species. Enhancements will occur on these 233.3 acres of Permit Area lands to increase their suitability for the Nelson’s antelope squirrel in the Permit Area. Habitat will be restored through the cessation of disking and, if needed, planting naturalized vegetation. The enhancement and management of these lands are presented in Section 5.3 and 5.4 below, and in Appendix C.
- Prior to the start of construction, conservation easements shall be recorded on the Solar Sites, and upon decommissioning, all Solar Sites, totaling 3,798.2 acres, will be managed in perpetuity for this species. Thus the project will result in 5,692.6 acres of habitat being placed into conservation easements and managed in perpetuity for this species.

Success Criteria

- Having preserved 180.6 acres of known Nelson’s antelope squirrel habitat as a permanent conservation easement, prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established conservation easements on 1,713.8 acres of currently unoccupied lands within the known range of Nelson’s antelope squirrel. These lands will be placed into conservation easements prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established a total of 5,692.6 acres of conservation easements for the benefit of Nelson’s antelope squirrel within the Maricopa Sun Solar Complex.

5.2.4 WESTERN BURROWING OWL

Goals

The primary goals for the western burrowing owl are to:

1. Preserve existing populations of the western burrowing owl within the Permit Area; and
2. Provide and enhance habitat for the western burrowing owl within the Permit Area.

Measurable Objectives

The measurable objectives to support meeting the above goals are:

1. Preserve existing populations of the western burrowing owl within the Permit Area.
 - The western burrowing owl is known to occur within the Permit Area on Solar Sites 3-S, 6-S, and 7-S, and on Conservation Sites 3-C2 and 9-C. Western burrowing owls were also observed adjacent to Solar Sites 2-S, 5-S, and 15-S and Conservation Sites 1-C, 3-C, and 10-C. Site 17-C appears to contain suitable habitat for the western burrowing owl, but none have been observed on the site. Western burrowing owls occurring on the Solar Sites are foragers and transients and do not breed on those sites, as evidenced by a lack of owl burrows on those lands. Sign does exist that the western burrowing owl forages and burrows on Conservation Sites 3-C2 and 9-C. The 152.9-acre Conservation Site 3-C2 and the 180.6-acre Conservation Site 9-C will be placed into a conservation easement and managed in perpetuity for this species, resulting in a total of 333.5 acres of existing habitat preserved for the species. The enhancement and management of these lands are summarized in Sections 5.3 and 5.4, below, and in Appendix C.
2. Provide habitat for western burrowing owls within the Permit Area.
 - In addition to the 333.5 acres of preserved, occupied habitat, conservation lands totaling 1,560.9 acres (Site 1-C = 656.6 acres, Site 3-C = 80.4 acres, Site 10-C = 176.2 acres, and Site 17-C = 647.7 acres) have the potential to provide habitat for this species and will be preserved in perpetuity. Enhancements will occur on the 1,894.4 acres of Conservation Site lands for the western burrowing owl in the Permit Area. Habitat will be restored by the cessation of disking and, if needed, planting naturalized vegetation. The enhancement and management of these lands are presented in Sections 5.3 and 5.4, below, and in Appendix C.
 - Perching posts constructed from T-posts will be provided at a rate of one per 20 acres within Conservation Areas. A 2-foot-long section of T-post will be welded to the top of each T-post, at a right angle to the main post, to provide a suitable perching surface. Dens constructed for use by kit fox will serve the dual purpose of also providing denning opportunities for the western burrowing owl. The number and placement of artificial dens installed for kit fox will coincide with the placement of 25 percent of perching posts to encourage western burrowing owls to use artificial dens.
 - The 33.8 acres of Movement Corridors located along the borders of Solar Sites 2-S, 3-S, 4-S, and 7-S will be enhanced and managed for western burrowing owls. Habitat will be restored by the cessation of disking, and if needed, planting natural vegetation. The enhancement and management of these lands are presented in Sections 5.3 and 5.4, below, and in Appendix C.

T-posts will be driven into the top of earthen berms at a rate of eight per mile along Movement Corridors. T-post design and installation will be as described above for Conservation Areas.

- Prior to the start of construction, conservation easements shall be recorded on the Solar Sites, and upon decommissioning, all Solar Sites, totaling 3,798.2 acres, will be managed in perpetuity as conservation lands for western burrowing owls. Thus, the project will result in 5,692.6 acres of habitat for the western burrowing owl, including 647.7 acres of potential habitat (Conservation Site 17-C), being placed into conservation easements and managed in perpetuity for this species.

Success Criteria

- Having preserved 333.5 acres of occupied western burrowing owl habitat as a permanent conservation easement. These lands will be placed into conservation easements prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established conservation easements on 1,560.9 acres of land not currently occupied, but with the potential to provide foraging and burrowing habitat within the Permit Area. These lands will be placed into conservation easements prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established one T-post perch per 20 acres of land within one year of conservation easements being established. The installation of these T-posts will be completed using a “phased” approach coinciding with placing the lands into a conservation easement (see Chapter 8, Section 8.2).
- Having established 33.8 acres of Movement Corridors as conservation easements with eight T-post perches per mile.
- Having established a total of 5,692.6 acres of conservation easements for the benefit of western burrowing owls within the Maricopa Sun Solar Complex.

5.2.5 BLUNT-NOSED LEOPARD LIZARD

Goals

The primary goals for the blunt-nosed leopard lizard are to:

1. Preserve existing populations of the blunt-nosed leopard lizard within the Permit Area; and
2. Provide habitat for the blunt-nosed leopard lizard within the Permit Area.

Measurable Objectives

The measurable objectives to support meeting the above goals are:

1. Preserve existing populations of the blunt-nosed leopard lizard within the Permit Area.
 - The blunt-nosed leopard lizard is historically known to occur within the Permit Area only on Conservation Site 9-C (180.6 acres), which contains saltbush scrub habitat, and adjacent to Solar Sites 2-S and 3-S. Although the species was not detected on Conservation Site 9-C during project-related surveys, there are numerous records of the blunt-nosed leopard lizard occurring in contiguous habitat, and it is likely that they are present within the native saltbush scrub area of Site 9-C. Similarly, this species may be present on 647.7 acres of Site 17-C based on the presence of natural habitat, although the species presence has not been confirmed. Lands within the Permit Area with the potential to support existing populations of blunt-nosed leopard lizards, totaling 828.3 acres, will be placed into a conservation easement and managed in perpetuity for the species. The enhancement and management of these lands are summarized in Sections 5.3 and 5.4, below, and in Appendix C.

2. Provide habitat for blunt-nosed leopard lizards within the Permit Area.
 - Based on the presence of natural habitat, the blunt-nosed leopard lizard is likely to occur on approximately 828.3 acres of land within the Permit Area. These lands will not be impacted by the project and will be conserved and managed in perpetuity for this species.
 - Additional lands totaling 1,066.1 acres (Site 1-C = 656.6 acres, Site 3-C = 80.4 acres, Site 3-C2 = 152.9 acres, and Site 10-C = 176.2 acres) have the potential to be occupied by blunt-nosed leopard lizards once disking ceases and the lands are allowed to become revegetated. Enhancements will occur on the 1,066.1 acres of Permit Area lands. Habitat will be restored by the cessation of disking, and if needed, planting natural vegetation. The enhancement and management of these lands are presented in Sections 5.3 and 5.4, below, and in Appendix C.
 - Prior to the start of construction, conservation easements shall be recorded on the Solar Sites, and upon decommissioning, all Solar Sites, totaling 3,798.2 acres, will be managed in perpetuity for this species. Thus, the project will result in 5,692.6 acres of land being placed into conservation easements and managed in perpetuity for this species.

Success Criteria

- Having preserved as permanent conservation easement approximately 828.3 acres of natural habitat currently able to support blunt-nosed leopard lizard populations. These lands will be placed into conservation easements prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).
- Having established conservation easements on approximately 1,066.1 acres of land currently unoccupied, but within the known range of blunt-nosed leopard lizards. These lands will be placed into conservation easements prior to construction activities and “phased” to coincide with construction (see Chapter 8, Section 8.2).

- Having established a total of 5,692.6 acres of conservation easements for the benefit of blunt-nosed leopard lizards within the Maricopa Sun Solar Complex.

5.3 Enhancing Vegetation within the Permit Area

Enhancements will be made within the Permit Area to assist in achieving the species specific biological goals and objectives for the Covered Species (Section 5.2). Covered Species occur in a variety of grassland and scrubland habitats. In the southern San Joaquin Valley, the San Joaquin kit fox is commonly associated with Valley Sink Scrub, Valley Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland, both grazed and not grazed. The Tipton kangaroo rat inhabits remnants of their historic range that have one or more species of sparsely scattered woody shrubs, and a ground cover of mostly introduced and native annual grasses and forbs. They occur in terrace grasslands devoid of woody shrubs, with sparse to moderate shrub cover being associated with high density populations. Blunt-nosed leopard lizards inhabit open, sparsely vegetated areas of low relief on the San Joaquin Valley floor. They are most commonly found in the non-native grassland and Valley Sink Scrub communities but are also found in Saltbush Scrub communities with sparse to moderate shrub cover. It has been speculated that 15 to 30 percent bare ground was optimal for leopard lizard habitat and greater than 50 percent was unsuitable (Chesemore 1980). Nelson's antelope squirrel occupies dry flat or gently rolling terrain consisting of sparse grassy or shrubby habitat, including annual grassland and alkali desert scrub. Nelson's antelope squirrel rarely digs its own burrow, relying instead on the burrows of other small mammals. The western burrowing owl is a grassland specialist distributed throughout western North America, primarily in open areas with short vegetation and bare ground in desert, grassland, and shrub-steppe environments (USFWS 2003a). Western burrowing owl nesting habitat consists of open areas with mammal burrows. They use a wide variety of arid and semi-arid environments, with well-drained, level to gently sloping areas characterized by sparse vegetation and bare ground (Haug et al. 1993, Dechant et al. 1999).

In general, all of the Covered Species tend to avoid areas of dense shrubs. Preliminary research indicates that populations of the San Joaquin kangaroo rat (i.e., Tipton kangaroo rat), Nelson's antelope squirrel, and blunt-nosed leopard lizard are affected negatively by thick herbaceous cover (Germano et al. 2001, 2012). Although the Covered Species can occur in a variety of habitats and within a variety of conditions within those habitats, grassland and scrub habitats with less than 20 percent shrub cover, less than 50 percent grass and forb cover, and a relatively low level of residual dry matter (RDM) of 500 to 1,500 lbs per acre is a reasonable target to achieve (Germano et al. 2012). Under the Project MSHCP, the initial planting of vegetation and adaptive management will focus on establishing and managing for these conditions (see Section 5.3).

Vegetative recovery and habitat restoration will be achieved by the cessation of disking. No additional vegetation enhancement will be undertaken unless suitable habitat conditions do not naturally develop. The areas within the Solar Development Footprints will be managed to facilitate the operations and maintenance of the solar facilities and will not be managed in a manner that will enhance the sites for Covered Species. However, upon decommissioning, the areas within the Solar Development Footprints will be enhanced as defined for the Conservation

Sites. Movement Corridors and Conservation Sites will be enhanced and managed for the benefit of Covered Species as described below.

Vegetation enhancements will foster the growth and establishment of native vegetation to aide in the recovery of previously disked lands should those lands not recover as rapidly as predicted. Habitat enhancements will be conducted in support of the species specific goals and objectives outlined in Section 5.2, above, and do not have unique goals and objectives. Parameters for the management of the Conservation Areas are provided in Appendix C.

Because disking is currently performed biannually on the Movement Corridors and many of the Conservation Sites, normal ecological function is prohibited. Research has shown that, following complete loss of vegetation (e.g., resulting from fire) in habitat such as exists in the vicinity of the Project, plant and wildlife species begin to recover within two to three years, and can return to pre-disturbance levels within five to seven years (e.g., Germano et al. 2012). Cessation of disking, along with appropriate management of the conservation easements, will allow revegetation, and will provide additional available cover and opportunities for breeding, and increase foraging opportunities for Covered Species. In the event that habitat recovery does not proceed as rapidly as predicted (e.g., due to drought conditions), vegetative enhancement will be performed as outlined below.

5.3.1 ENHANCEMENTS AND IMPROVEMENTS TO THE MOVEMENT CORRIDORS

Movement Corridors will be maintained on four of the Solar Sites (Sites 2-S, 3-S, 4-S, and 7-S) to facilitate regional wildlife movements and provide linear strips of habitat for covered species on those sites. The intent is to provide suitable habitat to reduce the effects of habitat fragmentation on local populations. The 50-foot-wide corridors will be placed along the perimeters of the Solar Sites such that they maintain connectivity between the sites and nearby native habitats.

Movement Corridors will be established along the north perimeter of Site 2-S, the north, east and south perimeters of Site 3-S, the south perimeter of Site 4-S, and the north perimeter of Site 7-S (Figure 2-1 in Chapter 2). Project-related ground disturbance will not occur within any of the Movement Corridors; however, conservation measures will require substantial ground disturbance during the creation of berms, installation of dens and perches, and the implementation of other conservation measures. For the most part, these areas are disked. Therefore, no vegetation will be disturbed during conservation activities.

Enhancement of vegetative communities within the Movement Corridors (Sites 2-M, 3-M, 4-M and 7-M) will be done through active and passive strategies. There is sufficient evidence (e.g., Germano et al. 2012) to suggest that, when disking is discontinued, the Movement Corridors will naturally revegetate with a variety of native species, including alkali seepweed (*Sueada* sp.), saltbush (*Atriplex* sp.), cheeseweed (*Isocoma acradenia*), and a variety of native and non-native annuals. However, seeding may be required to establish native vegetation along some Movement Corridors if they have not revegetated on their own within three growing seasons. Given that remnant patches of representative plant species of Valley Saltbush Scrub and Alkali Sink habitat are present on some of the Solar Sites and in the surrounding vicinity, a seed palette for re-

vegetation efforts will include native annual and perennial species that are known to occur in these habitat types. The seed palette for restoration efforts will include a minimum of five species selected from Table 5-1, with at least one being a shrub species. Other species may be substituted with the recommendation of a restoration botanist and with the approval of the USFWS.

Table 5-1
Seed Palette for Restoration Efforts
Maricopa Sun Solar Complex, Kern County, California

Forb and Grass Species	Shrub Species
<i>Common spikeweed (Hemizonia pungens)</i>	Seepweed (<i>Sueada moquinii</i>)
<i>Alkali goldfields (Lasthenia chrysantha)</i>	Valley saltbush (<i>Atriplex polycarpa</i>)
<i>Alkali barley (Hordeum depressum)</i>	Spiny saltbush (<i>Atriplex spinifera</i>)
<i>Peppergrass (Lepidum sp.)</i>	Cheeseweed (<i>Isocoma acredenia</i>)
<i>Small fescue (Vulpia microstachys)</i>	Iodine bush (<i>Allenrolfea occidentalis</i>)

The native seed will be applied to areas within the Movement Corridors via hand-broadcast. Seed may be mixed with equal parts clean and damp sand to aid in broadcasting. With this method, the seed mix is applied in a two-step application. Step one consists of broadcasting one-half of the seed mix across the planting area in one direction (e.g., north to south). Step two consists of broadcasting the remaining seed over the same area while moving in a perpendicular direction to step one. Broadcast seeding will occur only during low to no wind conditions. Subsequent to dispersal, seeds will be worked into the soil with rakes. Supplemental water application, if any, will be applied as determined appropriate by a qualified biologist, subject to review and approval by the USFWS, and will be based upon weather patterns and soil moisture levels. Target dates for grass and forb planting in the Central Valley are generally in the winter when soils are moist and seeds are poised to undergo spring germination.

In addition to vegetation enhancements, raised earthen berms will be created within Movement Corridors. The berms will be linear to facilitate construction by mechanical means, but they will not necessarily be continuous; gaps will be provided at strategic locations to allow flood waters to pass without causing undue damage to the berms. The berms will be constructed to widths of no less than 15 feet, and heights of approximately six feet above grade to allow for settling and erosion over time, which will ultimately result in berms of an anticipated height of three to four feet. All berms will be created using topsoil from the project site. A ditch no greater than three feet deep and 10 feet wide with sides graded such that no entrapment of wildlife will occur; i.e., a slope of no greater than 27 degrees will be excavated along one side of the berm. This ditch is intended to collect and direct water flow and will additionally provide habitat for burrowing mammals along the bank. A maintained dirt road will be constructed alongside the ditch.

5.3.2 ENHANCEMENTS AND IMPROVEMENTS TO THE CONSERVATION SITES

The Conservation Sites (Sites 1-C, 3-C, 3-C2, 9-C, 10-C and 17-C) totaling 1,894.4 acres will be enhanced and managed in perpetuity for Covered Species. Conservation Sites 1-C, 3-C, 9-C (upper portion only), and 10-C have been repeatedly disked for weed control and are devoid of vegetation. Site 3-C2, which is 152.9 acres, has been disked in the past, but it has not been

disked in a number of years and is beginning to become revegetated and to provide habitat. Seeding of vegetation on Site 3-C2 will likely not be conducted because that site is currently recovering with native vegetation. The southern 83.25 acres of Site 9-C is vegetated with Saltbush Scrub habitat, but portions of that site show signs of past disturbance from heavy equipment. Project-related ground disturbance leading to vegetation removal will not occur within any of the Conservation Sites; however there will need to be substantial ground disturbance within these areas during the creation of topographic relief, the installation of dens and perches, and the implementation of other conservation measures. All of these sites will undergo enhancements to varying degrees as described below.

Conservation Site 17-C is in a relatively native state, having never been actively farmed or tilled. It contains native Valley Saltbush Scrub (*Atriplex spinifera* and *A. polycarpa*), Chenopod Scrub, and goldenbush (*Isocoma acradenia*) habitat communities within a matrix of non-native annual grassland (Chapter 3; Quad Knopf 2009). Seeding or other vegetation enhancements will not be conducted on this site, unless unforeseen circumstances (such as a fire) make enhancement necessary. If seeding is needed, seeds will be collected from on site, and applied using a seed drill or hand-broadcast.

The establishment of vegetative communities within the disked portions of the remaining four Conservation Sites (Site 1-C, Site 3-C, the northern 97.35 acres of Site 9-C, and Site 10-C) will be accomplished through both active and passive strategies. There is sufficient evidence to suggest that the Conservation Sites will naturally revegetate (e.g., Germano et al. 2012), following cessation of disking with a variety of native species, including alkali seepweed (*Suaeda* sp.), saltbush (*Atriplex* sp.), cheeseweed, and various native and non-native annuals. However, seeding may be required to establish native vegetation within some portions of the sites, if they have not revegetated on their own within three growing seasons. Given that remnant patches of representative plant species of Valley Saltbush Scrub and Alkali Sink habitat are present in the vicinity surrounding the Conservation Sites, a seed palette for re-vegetation efforts will include native annual and perennial species that are known to occur in these habitat types. The seed palette for restoration efforts will include a minimum of five species selected from Table 5-1, with at least one being a shrub species. Other species may be substituted with the recommendation of a restoration botanist and with the approval of the USFWS.

The native seed will be applied to the Conservation Sites using a seed drill. In some areas, hand-broadcast seeding may be needed (such as in areas where topographic relief has been created). The methods for hand-broadcast seeding are described in Section 5.3.1. Target dates for grass and forb planting in the Central Valley are generally in the winter when soils are moist and seeds are poised to undergo spring germination. Seeding rates will be determined based upon the species used and the recommended seeding rates from seed suppliers. Generally, this is in the range of 5 to 15 pounds per acre.

5.3.3 ENHANCEMENTS AND IMPROVEMENTS TO THE SOLAR SITES

The Solar Sites will not be managed for the benefit of Covered Species until after the Project is decommissioned. While the solar facilities are operational, vegetation will be managed to facilitate the solar operations. Nonetheless, Covered Species may invade the developed Solar

Sites. Vegetation height will be managed on the Solar Development Footprints because vegetation that grows up around or above the solar panel structures will interfere with their functioning. Therefore, a maximum vegetation height of approximately two feet will be maintained within the Solar Development Footprints on the Solar Sites. Grazing will be used as the primary means of vegetation control on the Solar Sites. However, mowing or other mechanical means of vegetation control will also be used if needed. The physical removal of individual large plants using mechanical implements may sometimes become necessary. The removal of tamarisk or other problematic species using chemical means is likely to be required at times.

5.4 Management of Permit Area

Management of the Conservation Sites will be conducted following Appendix C. Management will be instituted in a phased approach; as conservation easements are placed on the lands, management of those parcels will begin. After the solar project has been decommissioned and once all Success Criteria (Section 5.2) have been met, the conservation easements will need to be maintained in perpetuity. Routine maintenance on the conservation lands will involve the following:

- Vegetation density management to maintain suitable conditions for Covered Species;
- Noxious weed control to maintain habitat integrity; and
- Maintenance of fencing on an ongoing basis.

Specific management activities that will be performed on Movement Corridors, Conservation Sites, and Solar Sites are described below.

5.4.1 MANAGEMENT OF CONSERVATION SITES

Vegetation management will be implemented on the Conservation Sites to maintain habitat in a condition that provides value for the Covered Species. Vegetation within the sites will be maintained at a height and density that is suitable for cover, breeding, and foraging by Covered Species. Vegetation density will be maintained such that it does not serve as a fire hazard.

Adaptive management will be used to manage for conditions suitable for the Covered Species. Although the Covered Species can occur in a variety of habitats and within a variety of conditions within those habitats, grassland and scrub habitats with less than 20 percent shrub cover, less than 50 percent grass and forb cover, and a relatively low level of residual dry matter (RDM) of 500 to 1,500 lbs per acre appears to be a reasonable target to achieve (Germano et al. 2012).

Suitable landscape cover will be maintained on the Conservation Sites by various techniques such as mowing, managed grazing of sheep, and scraping. Low intensity sheep grazing has historically occurred in the project region, and is considered one of the most effective and lowest impact methods for vegetation management available. Managed grazing will be the preferable method of vegetation control and will be used when possible. Sheep are preferred to cattle

primarily because cattle would be more likely to compromise the structural integrity of roads, berms, artificial dens and perches, and project fencing.

The Conservation Sites would be leased as grazing land for sheep at an appropriate stocking rate, determined through consultation with rangeland specialists and subject to review and approval by the USFWS (see Germano et al. 2012 for an example of grazing as a small vertebrate habitat management tool). The most suitable stocking rate(s) will ultimately be determined through adaptive management. For appropriate vegetation control, sheep are often placed on grazing lands in October of each year, and their numbers are gradually increased as forage quality and quantity improve. The majority of sheep will likely be removed by the end of May when forage availability becomes significantly reduced, but in wet years this period may be extended. Alternatively, higher stocking levels for shorter time periods can achieve similar results.

The spread of noxious weeds on the Conservation Sites will be controlled so that habitat integrity for Covered Species is not jeopardized. Noxious species threaten the diversity and abundance of native species through competition for resources, predation, parasitism, interbreeding with native populations, transmitting diseases, or causing physical or chemical changes to the invaded habitat. The most aggressive exotic plants are unacceptable in natural areas because they can exclude native plants, degrade, alter, or displace natural plant communities, promote faunal change, reduce biological diversity, disrupt ecosystem processes, alter fire frequencies, and threaten the persistence of sensitive plant and wildlife species. Aggressive non-native plants and noxious weeds often have little or no habitat value for native wildlife species, and can even alter the physical substrate (e.g., soil moisture), further rendering the habitat unsuitable for some species.

Management of the Conservation Sites will be accomplished following the Long-term Habitat Management Plan (LTHMP) (Appendix C).

5.4.2 MANAGEMENT OF MOVEMENT CORRIDORS

Vegetation management will be implemented on the Movement Corridors to maintain habitat in a condition that provides value for the Covered Species. Vegetation within the corridors will be maintained at a height and density that is suitable for cover, breeding, and foraging by Covered Species. Vegetation density will be maintained such that it does not serve as a fire hazard or interfere with Project operations.

Adaptive management will be used to manage for conditions suitable for the Covered Species. Although the Covered Species can occur in a variety of habitats and within a variety of conditions within those habitats, grassland and scrub habitats with less than 20 percent shrub cover, less than 50 percent grass and forb cover, and a relatively low level of residual dry matter (RDM) of 500 to 1,500 lbs per acre appears to create desirable habitat and is a reasonable target to achieve (Germano et al. 2012).

Suitable landscape cover will be maintained on the Movement Corridors by various techniques, such as mowing, managed grazing using sheep, and scraping. Low intensity sheep grazing has historically occurred in the Project region, and is one the most effective and lowest impact

methods for vegetation management available. Managed grazing will be the preferable method of vegetation control and will be used when possible. Sheep are preferred to cattle primarily because cattle would be more likely to compromise the structural integrity of roads, berms, artificial dens, perches, and project fencing.

Once the Movement Corridors have been improved, encroachment of construction activities and vegetation removal will be restricted by erecting security fencing along the boundaries of the Movement Corridors that adjoin Solar Development Footprints. Such fencing will be constructed using kit fox-friendly materials that are permeable to avoid introducing permanent barriers for movement of species (also see Chapter 2, Section 2.3.5).

Noxious weed control will follow management practices outline above in Section 5.4.1.

5.4.3 MANAGEMENT OF SOLAR SITES

During the operations and maintenance phase of the Solar Sites, the areas within the Solar Development Footprints will be managed in a manner that facilitates solar operations; no specific habitat enhancements or management actions will be implemented to benefit Covered Species. Nonetheless, it is anticipated that Covered Species may invade the Solar Sites, especially during the O&M phase after construction activities have ended. To ensure the protection of Covered Species, if they become present, avoidance and minimization measures will be implemented, including trapping and relocation of species if necessary (see Appendices E and F).

After decommissioning of the solar project, Solar Site lands will be managed to maintain suitable vegetative cover density for Covered Species as described in the above sections. Low intensity sheep grazing combined with vegetation mowing and scraping will be used to control vegetation density. Sheep grazing will be the preferred method of vegetation management due to its low impact and cost effectiveness. Sheep are preferred over cattle as they tend to have a lower impact on the structural integrity of fences, roadways, berms, and artificial and natural dens and perches. As with Movement Corridors and Conservation Sites, decommissioned Solar Sites will be managed to achieve grassland and scrub habitats with less than 20% shrub cover, less than 50% grass and forb cover, and a relatively low level of RDM of 500 to 1,500 lbs per acre (Germano et al. 2012).

Noxious weed control will follow management practices outline above in Section 5.4.1.

5.5 *Actions to Minimize Ground Disturbance*

The following activities will occur within the 3,798.2 acres of Solar Development Footprint disturbance area.

Solar Sites will be cleared of vegetation, soil will be compacted, and topography will be altered in areas proposed for solar field installation. Habitat occupied by Covered Species and other sensitive species will be avoided by ground disturbance activities, and exclusion fencing will be erected to protect those areas.. Occupied habitat will be designated as ESAs and will be protected by exclusion fencing consisting of staking ESA perimeters, creating rope borders, and attaching

survey flagging to clearly demarcate ESA boundaries. Equipment storage and parking areas will also be confined to designated areas.

Minimal site grading is anticipated throughout the Solar Development Footprint, and will be dependent upon site-specific topography. Tools used for clearing may consist of chainsaws, wood chippers, stump grinders and other grubbing equipment, agricultural disks and ring-rollers, and other tools and equipment. Soil will not be exported from or imported to any site. A qualified biological monitor will be on site during vegetation removal and grading activities when those activities take place within 200 feet of Covered Species or vegetated, natural habitat.

No construction-related ground disturbances will occur within the Conservation Sites. However, ground disturbance within some of these sites are anticipated to occur during enhancement activities, as previously described. Encroachment by construction activities will be restricted from Conservation Sites by installing temporary construction avoidance fencing along interfaces of construction areas/conservation lands that identify the conservation lands as environmentally sensitive areas. These boundaries will include, at a minimum, the east perimeter of Site 2-S, the north and west perimeters of Site 3-S, and the south and east perimeters of Site 3-C2. Conservation Site 1-C is separated from Solar Site 5-S by South Lake Road, and will therefore not require exclusion fencing. No potential encroachment of Project-related activities within Conservation Sites 9-C, 10-C or 17-C are anticipated because they are so far removed from the Solar Sites.

5.6 Benefits to Covered Species from Project Related Conservation Actions

Through the realization of the biological goals and objectives of the Conservation Program, as described in this MSHCP, impacts to Covered Species resulting from the Project will be mitigated and offset. This Conservation Program comprises two primary benefits toward fulfilling the species-specific biological goals and objectives.

First, the Project will result in the permanent protection of lands and the development of new habitat to encourage the colonization of Covered Species and other plant and wildlife species within the Permit Area. In general, most of the compensatory lands (Conservation Sites) constitute better habitat than the Solar Sites, because of the presence of vegetation communities favorable to support Covered Species. Eventually, lands within the Permit Area will no longer be disked, allowing them to return to a native state and to support more plant and wildlife species in general. These conserved lands all lie within the native range of the Covered Species and will constitute a significant addition to native protected lands. Second, all of the lands being included in the conservation easements will be fenced and managed in perpetuity for the benefit of Covered Species, therefore being protected from habitat destruction and future development.

Three categories of lands will be established as conservation easements to be protected in perpetuity. Movement Corridors and Conservation Sites will provide lands during the development and operation of the Project to encourage the growth of new habitat; and to provide safe dispersal lands between habitat fragments. At a later time, once the Project has been decommissioned, all of the Solar Site lands will be transitioned into the conservation easement

for the benefit of Covered Species and will greatly increase the total acreage of conservation lands.

The Solar Sites do not currently provide a habitat corridor or conduit corridor between the western Kern County core population of San Joaquin kit fox and an isolated population to the east of the Projects. Conservation of the Permit Area lands will provide new dispersal habitat where none currently exists (Appendix H). Integrated Movement Corridors will be provided along the edges of the Solar Development Footprints, and escape dens will be provided along these corridors to reduce the potential for mortalities due to competition and predation by coyotes. These corridors will enhance the potential for survival of San Joaquin kit foxes as they disperse throughout their range. Additionally, the Conservation Program includes measures that will enhance the potential for San Joaquin kit foxes to reside on the conservation lands, which is preferable to simply improving connectivity. The conservation lands will be fenced with a perimeter fence that will be raised above ground level, allowing San Joaquin kit foxes to move on and off the lands, while preventing unauthorized grazing activity and vehicle traffic from disturbing sensitive San Joaquin kit fox habitat. Artificial escape dens installed on the conservation lands will provide refuges to escape predation, reduce stress, and in which to rear pups.

Conservation actions include the cessation of disking, which will allow western burrowing owls to become established within the conserved lands. T-post perches installed throughout the conservation lands will provide elevated vantage points from which western burrowing owls can hunt, and provide escape from predation. Artificial burrows installed throughout the conservation lands will provide valuable refugia and nesting habitat. Additionally, increased activity by San Joaquin kit fox and other ground burrowing species will provide additional burrows for western burrowing owls to use. As the conservation lands will be fenced, these burrows will be protected from destruction due to unauthorized grazing and vehicular activity.

The blunt-nosed leopard lizard, Tipton kangaroo rat, and Nelson's antelope squirrel favor habitats that are open, with low levels of ground cover. Currently, disking nearly eliminates all vegetation from the Project lands, making the Permit Area generally undesirable for these species. Cessation of disking upon establishing the conservation easements will result in revegetation of the lands and will provide valuable habitat in core range distribution areas for each of these species. Specific vegetation management practices, such as low impact grazing and noxious weed control will ensure long-term habitat suitability. Exclusion of unauthorized grazing and vehicular traffic through the use of perimeter fencing will further protect habitat, ensure long term suitability, and ensure that established small mammal burrow systems are not damaged through cave-in.

6.0

MONITORING AND ADAPTIVE MANAGEMENT PROGRAM

6.0 MONITORING AND ADAPTIVE MANAGEMENT PROGRAM

This chapter describes the monitoring and adaptive management program for the MSHCP. The purposes of this program are to ensure compliance with the conditions of the MSHCP, assess the status of covered and other native species and natural communities within the conservation lands and on the Solar Sites; and to evaluate the effects and effectiveness of the management actions such that the conservation strategy described in Chapter 5, including the biological goals and objectives, are achieved. Adaptive management and monitoring will be integrated into one cohesive program, where monitoring will inform and change management actions to continually improve outcomes for covered and other native species and natural communities. An overview of the program, monitoring actions, and data management requirements follows.

Three specific types of monitoring will be conducted in association with the MSHCP that are mandatory elements of all HCPs (50 CFR 17.22, 17.32, and 222.307). These types of monitoring are:

1. Compliance monitoring, which tracks the permit holder's compliance with the requirements specified in the HCP and permit;
2. Effects monitoring, which tracks the effects of the Covered Activities on Covered Species; and
3. Effectiveness monitoring, which tracks the progress of the conservation strategy in meeting the biological goals and objectives of the HCP.

To ensure that all monitoring is properly implemented and tracked, a geo-database will be created. The database will contain information on:

- The physical and Project-related attributes of each Solar Site;
- The minimization and avoidance measures that must be employed for each Solar Site;
- The progress of construction activities on each Solar Site;
- The level of monitoring employed during construction, operations and maintenance, and decommissioning activities;
- Incidences of take of individuals of Covered Species and loss of Covered Species habitat;
- Compensatory requirements related to each of the Solar Sites;
- The physical and biological attributes of each of the Conservation Sites that would contribute to the conservation of each species;

- Habitat enhancement measures that are required to be performed on each Movement Corridor and Conservation Site;
- A list of surveys and studies, and a schedule for implementing those surveys and studies on each Project component (Solar Sites, Movement Corridors, and Conservation Sites); and
- Estimates of staffing needs for each identified task.

The database will be populated with relevant information as tasks are completed, including the results of surveys and studies. Information gleaned from queries of the database will help guide the adaptive management process.

The monitoring and tracking efforts that will be implemented for compliance monitoring, effects monitoring, and effectiveness monitoring are described below.

6.1 Compliance Monitoring

Maricopa Sun, LLC will ensure that compliance with the terms and conditions of the MSHCP are met by monitoring the implementation of minimization and avoidance measures during pre-construction activities, construction activities, operations and maintenance activities, decommissioning activities, and conservation actions within the Permit Area. A checklist of all minimization and avoidance measures will be used to ensure compliance with all provisions of the MSHCP. The official checklist of all minimization, avoidance, and mitigation measures will be known as the Minimization, Mitigation, Reporting, and Compliance Program (MMRCP). Compliance monitoring will comprise the following components:

- Tracking the conversion of lands on the Solar Sites and impacts to occupied Covered Species habitat to ensure impact limits are not exceeded, and to ensure compliance with the requirement of proactively providing compensation lands;
- Tracking the incidental take of Covered Species as a result of Covered Activities on Permit Area lands to ensure that minimization and avoidance measures are effective at reducing impacts to the level authorized under permits;
- Tracking the implementation and timing of habitat enhancement, restoration, and other conservation actions, such as the installation of fencing (see Chapter 5 and Appendix C);
- Tracking implementation of establishing conservation easements;
- Tracking implementation of minimization and avoidance requirements; and
- Tracking and reporting of management and monitoring activities.

Compliance monitoring will be conducted by qualified biologists that are approved by the USFWS. Compliance monitoring will consist of the following tasks presented by project phase.

6.1.1 COMPLIANCE MONITORING OF PRE-CONSTRUCTION AND CONSTRUCTION ACTIVITIES

Pre-construction activities and construction activities have the potential to adversely affect Covered Species (see Chapter 4). To ensure that all activities comply with the terms and conditions of the MSHCP, pre-construction surveys (see Chapter 2, Section 2.3.5) will be conducted prior to ground-disturbing activities to identify areas where Covered Species might be at risk. Monitoring of construction activities will occur to ensure that Project effects to Covered Species are minimized or avoided.

- Prior to any ground-disturbing activities, the biological monitors, under the direction of the Project lead biologist, will conduct pre-construction surveys of the Solar Development Footprint to determine locations of Covered Species and occupied habitat where specific minimization and avoidance measures will be required. These surveys will be conducted within two weeks prior to the start of pre-construction and construction activities. If more than two weeks pass between the date of the pre-construction survey and the initiation of project activities, a repeat of the pre-construction survey will be conducted.
- Biological monitors will be on site to monitor the placement and installation of exclusion fencing and flagging of ESAs, and for construction boundary fencing.
- Biological monitors will be on site to conduct pre-activity biological sweeps immediately prior to (the morning of) the initiation of construction activities to ensure that all work areas are free of Covered Species, to ensure that fencing is intact and maintained, and to ensure that all minimization and avoidance measures are being complied with.
- Biological monitors will be on site to closely monitor construction activities when those activities occur within 200 feet of area known to be occupied by Covered Species, except in the case of burrowing owls. Covered Activities occurring in proximity of known locations of burrowing owls require full-time monitors on site when activities occur at specified avoidance distances as identified in the “Staff Report on Burrowing Owl Mitigation” (CDFG 1995a), which are seasonally dependant and may require avoidance distances of up to 250 feet. Upon approval of USFWS, the on-site biological monitor may reduce buffers, but to do so it must be demonstrated that a reduction in the buffer distance does not adversely affect the Covered Species present. A full-time biological monitor must be present when activities are being conducted anywhere within the footprint of the reduced area.
- A post-activity biological sweep of the active construction areas will be conducted at the end of the workday to ensure that all SWPPP BMPs are correctly in place, that all trash or micro-trash has been disposed of properly, and that all minimization and avoidance measures are complied with.
- Biological monitors will track the incidental take of Covered Species and habitat to ensure that minimization and avoidance measures are effective in reducing impacts to the level authorized under permits.

- Biological monitors will track and document the progress of work conducted to install the solar facilities, and the corresponding biological clearance surveys and monitoring to verify compliance with MSHCP terms and conditions.

The number of biological monitors required at any given time will be a function of the number of Solar Sites under construction, the sizes of those Solar Sites, the intensity and extent of the pre-construction activities and construction activities being performed, the presence of Covered Species on or near the work areas, and the range of minimization and avoidance measures that are applicable to the work being conducted.

In areas within 200 feet of areas known to be occupied by Covered Species (or within up to 250 feet for burrowing owl occurrences), an individual monitor will accompany each construction crew working in the area. Biological monitors will not be required to directly accompany crews when working in areas where no Covered Species occur, based upon recurring site surveys (effectiveness monitoring surveys, Section 6.3), pre-construction surveys, and biological sweeps conducted immediately prior to construction.

A minimum of four biological monitors per 160 acres of Solar Site will be present each day throughout the construction period whenever construction activities are being performed to conduct biological sweeps, track the progress of construction, track the implementation of project mitigation measures, and respond to biological issues as they arise.

6.1.2 COMPLIANCE MONITORING OF OPERATIONS AND MAINTENANCE ACTIVITIES

Operations and maintenance activities will be routine to solar operations. Such activities as vehicle use during solar panel washing and occasional site inspections, and repairs to underground electrical components or other solar facility components that result in the need to perform ground disturbance have the potential to impact Covered Species, if those species become established.

The degree to which Covered Species will be at risk from operations and maintenance activities will be directly related to the degree that Covered Species become established on the Solar Sites. The establishment of Covered Species will be assessed as described in Section 6.3. The results of the information gathered during effectiveness monitoring (Tier 1 and Tier 2 studies, described in Section 6.3) will be used to determine the level of on-site compliance monitoring needed during the operations and maintenance phase activities. Ongoing effectiveness monitoring will provide much needed information on the occurrence of Covered Species, but specific pre-construction surveys and biological sweeps will be needed prior to ground-disturbing operations and maintenance activities to aid in species avoidance. Implementation of minimization and avoidance measures will limit impacts from operations and maintenance activities and no lethal take will occur.

Compliance monitoring during the operations and maintenance activities will include:

- Conducting pre-activity surveys prior to any operations and maintenance activities to determine the level of compliance monitoring required;

- Tracking the maintenance and repairs to the perimeter fencing and to other project facilities, including documenting and reporting on all maintenance activities conducted;
- Tracking implementation of minimization and avoidance requirements; and
- Tracking and monitoring the ongoing vegetation management on the solar sites.

To accomplish these tasks, biological monitors will conduct pre-activity surveys for any repair or maintenance actions that will be required. The monitors will conduct site inspections on a monthly basis throughout the operational period to track all maintenance and repair activities, inspect fencing and ensure fence repairs are conducted in a timely manner, ensure that all minimization and avoidance measures are implemented, and evaluate vegetation conditions and track vegetation management actions.

The number of monitors required at any given time will be a function of the number of Solar Sites that are in operation and the sizes of those Solar Sites.

6.1.3 COMPLIANCE MONITORING OF DECOMMISSIONING ACTIVITIES

Decommissioning activities have the potential to pose a higher risk of adverse affects on Covered Species than pre-construction and construction activities, primarily because Covered Species may become established on the Solar Sites during the solar operational life. The degree to which Covered Species will be at risk from decommissioning activities will be directly related to the degree that Covered Species become established on the Solar Sites. Throughout the operational period, surveys will be conducted on the Solar Sites to determine the rate and degree of site use by Covered Species. To ensure that the information available is timely, accurate, and of sufficient detail, comprehensive pre-activity surveys will be conducted immediately prior to decommissioning. Pre-activity surveys will provide information to determine the distribution and abundance of Covered Species on the sites so that the risk of take can be managed, and minimization and avoidance measures (including implementing relocation programs in consultation with USFWS) can be appropriately applied. On-site monitoring of decommissioning activities will occur to ensure that Project effects to Covered Species are minimized or avoided.

The following will be implemented:

- Prior to any ground-disturbing activities, biological monitors will conduct comprehensive pre-activity surveys of the Solar Sites to determine the extent of Covered Species' presence, and to identify areas of special concern where specific minimization and avoidance measures will be required. These surveys will be conducted no more than two weeks prior to decommissioning activities. If more than two weeks pass between the survey and initiation of the construction activities, an additional survey will be completed;
- Biological monitors will be on site to conduct pre-activity biological sweeps immediately prior to (the morning of) the initiation of removal activities (Chapter 2, Section 2.3.4);

- Biological monitors will be on site to continuously monitor decommissioning activities. When decommissioning activities occur within 200 feet of areas known to be occupied by Covered Species, biological monitors will be required to directly accompany each crew conducting that work. For monitoring of known locations of burrowing owls, specified avoidance distances identified in the “Staff Report on Burrowing Owl Mitigation” (CDFG 1995a) will apply. Upon approval by USFWS (and/or CDFW), the on-site biologist may reduce ESA avoidance buffers. In order to reduce a buffer, it must be demonstrated that a reduction in the buffer distance does not adversely affect the Covered Species present. A full-time biological monitor must be present to directly monitor activities that are being conducted anywhere within the footprint of the reduced area;
- Biological monitors will be on site to monitor the placement and installation of ESA fencing and flagging and project area boundary fencing;
- Biological monitors will conduct daily site inspections of active work sites during the decommissioning period to ensure that all work areas are free of Covered Species, or to ensure that affects to Covered Species are minimized, and to ensure that all minimization and avoidance measures are being complied with;
- A post-activity biological sweep of the active construction (decommissioning) areas will be conducted at the end of the workday to ensure that all trash or micro-trash has been disposed of properly, and that all minimization and avoidance measures have been complied with; and
- Biological monitors will track the take of Covered Species and habitat to ensure that impacts do not exceed the level authorized under permits.

The number of monitors required at any given time during decommissioning will be a function of the number of Solar Sites undergoing decommissioning activities, the intensity and extent of the decommissioning activities being performed, the presence of Covered Species on or near the work areas, and the range of minimization and avoidance measures that are applicable to the work being conducted. In areas within 200 feet of known Covered Species occurrences (or within up to 250 feet for burrowing owl occurrences), one biological monitor will directly accompany each construction crew. Monitors will not be required to directly accompany crews when working in areas where no Covered Species occur, based upon recurring site surveys (effectiveness monitoring surveys, see Section 6.3), pre-construction surveys, and biological sweeps conducted immediately prior to construction.

A minimum of four biological monitors per 160 acres of Solar Site will be present each day throughout the construction period whenever construction activities are being performed to conduct biological sweeps, track the progress of decommissioning, track the implementation of project mitigation measures, and respond to biological issues as they arise.

6.1.4 COMPLIANCE MONITORING OF CONSERVATION ACTIONS

Conservation actions include placing conservation easements on conservation lands, installing fencing around the perimeters of conservation lands, installing micro-topographic relief, and

implementing vegetation enhancement and control measures. Conducting studies to determine and monitor the use of conservation lands by Covered Species is discussed in Section 6.3, but the results of those monitoring efforts will be tracked as part of the compliance monitoring.

- Compliance monitoring of conservation actions will require both on-site monitoring and tracking of implementation of specified measures, as follows: Tracking the placement of conservation easements on identified properties to ensure that dedicated conservation lands remain at or above minimum requirements relative to the development of Solar Sites, and that the appropriate species-specific habitat ratios are being met (i.e., expected habitat losses on a species-by-species basis are adequately compensated for prior to the phased solar development).
- On-site monitoring and tracking of the applied habitat enhancement measures (e.g., fencing, micro-topographic relief, habitat creation activities, installation of dens and perches, vegetation control measures) to ensure that they are implemented at the appropriate time, that they are in compliance with the prescribed level of effort, and that appropriate minimization and avoidance measures are employed during the performance of these actions.
- Tracking of the performance of surveys and studies to determine the use of the Conservation Sites by Covered Species.

Compliance monitoring of conservation actions will require a variable effort, dependent upon the rate at which solar development proceeds (in terms of both number and acreage), the concomitant amount of conservation lands that must be placed into easements and managed, and the actions that are prescribed to occur on each Conservation Site.

6.2 Monitoring the Effects on Covered Species

Maricopa Sun, LLC will monitor the effects of Covered Activities on the San Joaquin kit fox, Tipton kangaroo rat, Nelson's antelope squirrel, western burrowing owl, and blunt-nosed leopard lizard. Research will be needed to analyze changes in habitat and species conditions, both on the Solar Sites, and within Movement Corridors and Conservation Areas. Evaluation of data gathered through research and monitoring will be necessary to determine the effects of the solar development on these species and the effectiveness of conservation actions. Data maintained in the geo-database will be compiled to document the amount of take incidental to construction and other Covered Activities. Incidental take covered under the MSHCP will be documented in the geo-database and reported to the USFWS to ensure compliance.

Evaluation of the effects of the Project on Covered Species will be achieved through the use of both qualitative and quantitative data. Management outcomes will be compared with management goals (as described in Chapter 3 and in Appendix C), and Project conditions will be compared with Project objectives (Chapter 5). Data will be evaluated based on the following criteria:

- Level of take of species and habitats during pre-construction, construction, operations and maintenance, and decommissioning activities;

- Physical outcomes related to increased use of the Solar Sites, Movement Corridors, and Conservation Sites by Covered Species and other special-status species (i.e., changes in species numbers, changes in species distribution, changes in habitat distribution, amount of habitat destroyed as documented in the geo-database); and
- Status of threatened and endangered species based on community composition.

Monitoring will be conducted to document Project outcomes and impacts and to assess the effects and effectiveness of conservation strategies on both species and their habitat. The survey and study methodologies presented in the following section (Section 6.3) will be used as a basis for determining some of the Project effects on Covered Species.

6.3 Monitoring of the Effectiveness of the Conservation Program

The data obtained from the process described in the previous section (Section 6.2) will assist Maricopa Sun, LLC and the USFWS in assessing the effectiveness of the MSHCP. The following effectiveness monitoring description applies to Solar Sites, Conservation Areas, and Movement Corridors. The primary purposes of effectiveness monitoring will be to:

- Develop information regarding the use of Conservation Sites by Covered Species; and
- Develop information regarding the effectiveness of conservation efforts by quantifying the effectiveness of the conservation program based on monitoring the status of the measurable objectives (Chapter 5).

Data from the geo-database will be queried to determine: (1) the number and size of Solar Sites completed and the area of habitat affected for each Covered Species; (2) compliance with the minimization and avoidance measures; (3) area of compensatory mitigation secured; (4) degree of use of the Conservation Sites by Covered Species; and (5) any observations of injured or dead Covered Species. This review process will be used to help ensure that the MSHCP's operating conservation program is successful.

To monitor the effectiveness of the Project's conservation program, the use of the Solar Sites, Movement Corridors, and Conservation Sites by Covered Species will be evaluated on a routine basis throughout the life of the Project. The use of the Conservation Sites by Covered Species will be monitored in perpetuity to ensure adequate implementation of management actions and to ensure that MSHCP objectives and goals are continuously met. Management goals and objectives, and management actions are provided in Chapter 3 and in Appendix C. The surveys and studies outlined below will be implemented during the operational life of the Project.

Baseline habitat conditions on most of the Solar Sites, Movement Corridors, and Conservation Sites are of poor quality for native species due to repeated disking (Quad Knopf 2010a). The Sites are generally situated within a larger landscape matrix that supports sparse populations of Covered Species, including the San Joaquin kit fox, Tipton kangaroo rat, Nelson's antelope squirrel, western burrowing owl, and blunt-nosed leopard lizard, as well as other special-status species. It is anticipated that the proximity to existing populations of Covered Species, coupled with the components of the conservation program, including the protection and enhancement of

Movement Corridors, will increase the value of the Solar Sites to Covered Species. It is possible that the installation of solar panels will be compatible with some Covered Species (O'Farrell and Uptain 1985). Thus, expansion of populations and increased use of the land beneath and between the solar arrays is anticipated. One purpose of the monitoring program will be to develop information regarding the suitability of a solar complex as habitat for the Covered Species. The monitoring program will also provide information on the long-term use of conservation lands by special status species, and information useful in developing and implementing adaptive management prescriptions.

6.3.1 MONITORING SPECIES USE OF THE SOLAR SITES, MOVEMENT CORRIDORS, AND CONSERVATION SITES

The monitoring program outlined herein includes the evaluation of habitat within Solar Sites, Conservation Sites and Movement Corridors. This evaluation will be conducted to determine changes in vegetation cover and use by Covered Species and other wildlife, and will be used to drive management decisions. Evaluations will also be conducted on representative native habitat in the region to monitor natural fluctuations in abundance of Covered Species. Standard methodologies will be applied to these efforts.

Study Design

The Solar Sites, Movement Corridors, and most of the Conservation Sites currently consist of repeatedly disked lands providing poor quality habitat for foraging, breeding, and dispersal of Covered Species. It is anticipated that some period of time (five years, for example) will be required for these lands to become more suitable to Covered Species, even with applied enhancement measures. Because of these existing conditions, two tiers of studies are appropriate: Tier 1 and Tier 2.

Tier 1 studies consist of broad-based, wide-ranging, cursory surveys to detect the presence of Covered Species on a site-wide basis, and are focused on simply determining whether the Sites are used by Covered Species, and if so, how extensive that use is. These surveys will include small mammal trapping where burrows are found, to verify species presence. Both qualitative and quantitative techniques will be used in these site-wide evaluations.

Tier 2 studies are designed to gather much more precise data on the use of the sites by Covered Species, and provide data that can be used to evaluate the effects of management actions. Tier 2 studies are designed to provide information on the abundance of Covered Species, to quantitatively track changes in habitat conditions, and to provide comparative and replicated data for a rigorous analysis. The methodologies for these two tiers of studies are provided below.

TIER 1 STUDY METHODOLOGY

Tier 1 studies will consist of evaluating the Solar Sites, Conservation Sites, and Movement Corridors to assess the use of these areas by Covered Species, determine rates of Covered Species establishment, and evaluate broad-scale habitat conditions. Tier 1 studies are not intended to assess presence of Covered Species for the purpose of clearing a site for Covered Activities (see Pre-Activity Surveys, Chapter 2, Section 2.3.5). Methods employed will consist

of conducting pedestrian transect surveys, night spotlighting surveys, inspections of installed dens, evaluations of the use of installed perches; and verification trapping for small mammals, if burrows are encountered.

The primary method employed will be to conduct pedestrian transects across all Sites at a rate of one transect each 100 feet, or the equivalent of 53, one mile-long transects per square mile. Because of the configuration of the Movement Corridors, only a single transect will be walked along each linear mile of the Movement Corridors. Transect surveys will be conducted only when air temperatures are between 77 and 95 degrees Fahrenheit. During these transect surveys, all sightings and diagnostic signs of Covered Species will be noted, and habitat characteristics will be qualitatively documented. Transect surveys will be conducted once per survey season, between April 15 and June 30. Night spotlighting will be conducted around the perimeter of each Site, or if access is not available, around all accessible areas of each Site. Spotlighting will be conducted during three consecutive nights, once each survey season (April 15 to June 30). All installed dens and perches will be inspected for use by Covered Species twice per year, once between April 15 and June 30, and once between August 1 and October 1. All sightings and diagnostic signs of Covered Species will be documented.

Species verification trapping for the Tipton kangaroo rat will be conducted in representative areas containing small mammal burrows. No trapping will be required at a Tier 1 level on a Site where Tipton kangaroo rats have been trapped within Tier 2 study plots. When trapping is required, it will be conducted once each survey season (April 15 to June 30) until a Tipton kangaroo rat is captured or for three consecutive nights in the event that no individuals are trapped.

No more than two representative areas within a 320-acre portion of a Site will be trapped. The number of traps deployed will be dependent upon the number and distribution of burrows present and the patch size of the area occupied. In some cases, especially soon after the cessation of disking, as few as 10 traps in each area may be sufficient to sample a patch of small mammal habitat. As occupied patch sizes increase, additional traps may be needed. However, in no case shall more than 100 traps be deployed per occupied area.

Tier 1 studies will be conducted each year on the Solar Sites, beginning the year after solar facilities have been installed, until the sites have been decommissioned. Tier 1 studies will be completed on the Movement Corridors each year beginning the year after their establishment and continuing until decommissioning. Tier 1 studies will be completed on the Conservation Sites beginning within one year of having a conservation easement placed on the land and continuing until the year of decommissioning. Upon decommissioning, Tier 1 studies will be replaced with long-term management studies, as described in the Long-term HMP (LTHMP) (Appendix C).

TIER 2 STUDY METHODOLOGY

A study plot will be established within each 320-acre block of each Solar Site and Conservation Site. Each plot will be 20 acres (approximately 933 feet on a side), and roughly centered within each 320-acre block. Some adjustments in study plot size and configuration, as well as placement locations may need to be made to accommodate site-specific conditions. For example, Conservation Site 3-C2 is 150 acres and triangular. Although this site is less than 320 acres, it

does represent a primary conservation area and a study plot will be established within its boundary. The placement of the study plot within that Conservation Site will need to be skewed to the east of center. At full project buildout, there will be 18 study plots totaling 360 acres established within the Permit Area, with 8 of those plots being established within Conservation Sites (Figure 6-1). Within each plot, plant transects, small mammal trapping lines, bird survey transects and point counts, and reptile transects will be conducted. In addition to these plot-specific activities, off-plot activities conducted as part of Tier 2 studies will include plant transects and track station monitoring. A conceptual study plot design is provided (Figure 6-2) and descriptions of the tasks to be conducted are below.

Sampling will occur on these study plots each year for the first five years after construction of Solar Sites, and each year for the first five years after easements have been placed on the Conservation Areas. After the first five years, it is anticipated that ecological conditions will begin to stabilize and the goals and objectives of the conservation program will have been met. After the first five years, the level of sampling will be reduced to once each three years for the duration of the life of the project to track the suitability of habitat conditions (e.g., vegetation densities and weed control). Upon decommissioning, sampling will be replaced by protocols presented in the LTHMP (Appendix C).

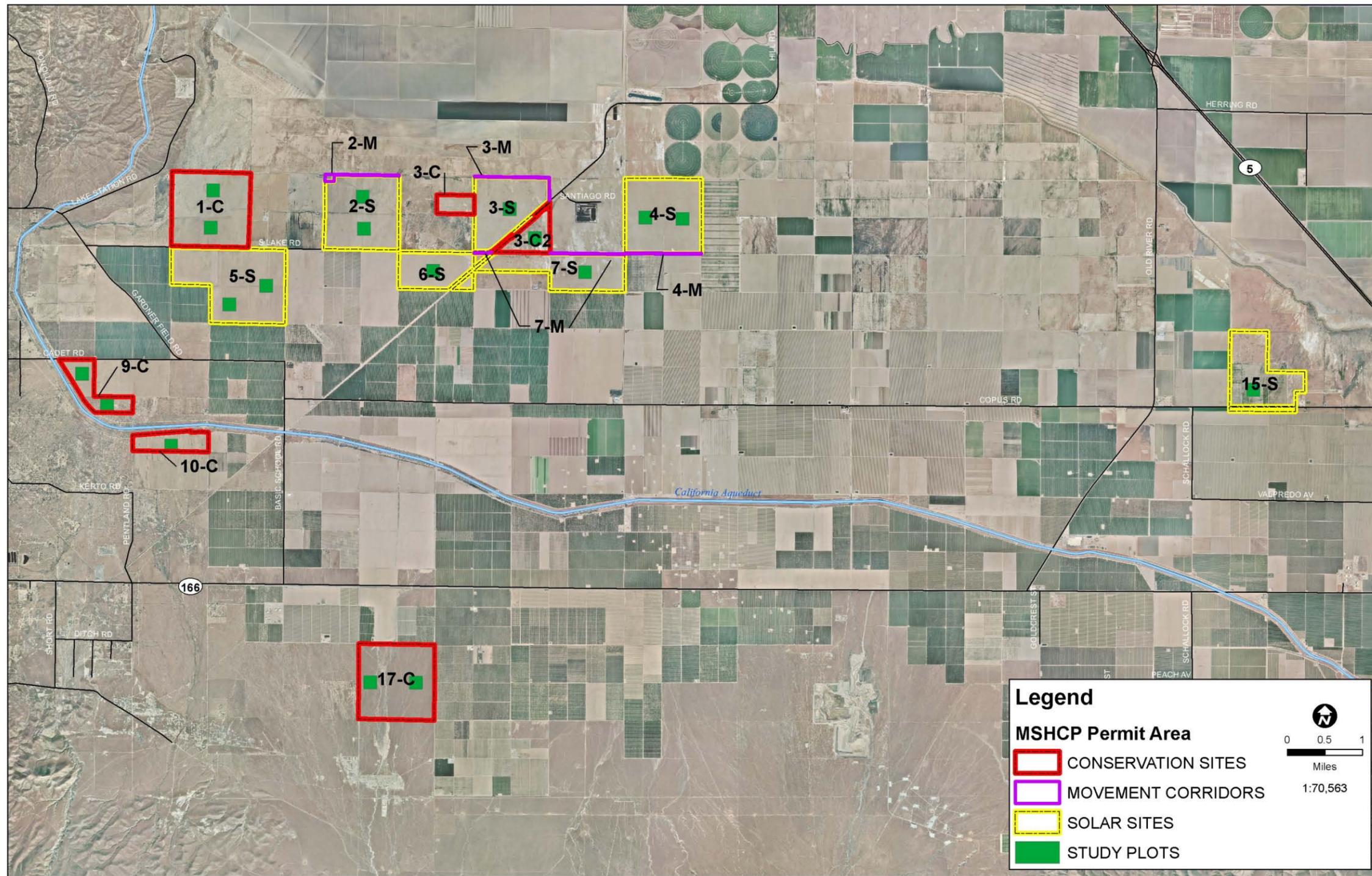
Sampling will be conducted concurrently (within a three-week period) on the study plots to reduce variation due to temporal conditions. All transects will be placed at right angles to the solar installations to ensure that each transect encompasses the greatest amount of diversity available on the plot (i.e., both the vegetated areas that are anticipated to develop under the solar panels and the non-vegetated maintenance roads situated between the panels).

All data collected will be entered into a geo-database and proofed to ensure accuracy prior to analysis. Descriptive statistics, Student's t-tests, Analysis of Variance (ANOVA), and other relevant statistical analyses will be performed as appropriate, using suitable statistical software. Repeated measures analysis will be used to track changes in vegetation and wildlife use of the study plots over time and in response to habitat improvement. Specific methodologies used for each sampling regime are described below.

Vegetation Sampling

Vegetation sampling will be conducted along four 328-foot long transects. Sampling will occur during the spring of each sampling year. Ten vegetation samples (approximately 13.5 in x 27.5 in rectangular quadrants) will be taken from each transect.

A stratified random sampling approach will be employed on the Solar Sites, with each transect divided into two primary categories: areas under solar panels and areas not under solar panels. Five quadrants will be randomly placed within each category along each transect.



Legend

MSHCP Permit Area

- CONSERVATION SITES
- MOVEMENT CORRIDORS
- SOLAR SITES
- STUDY PLOTS



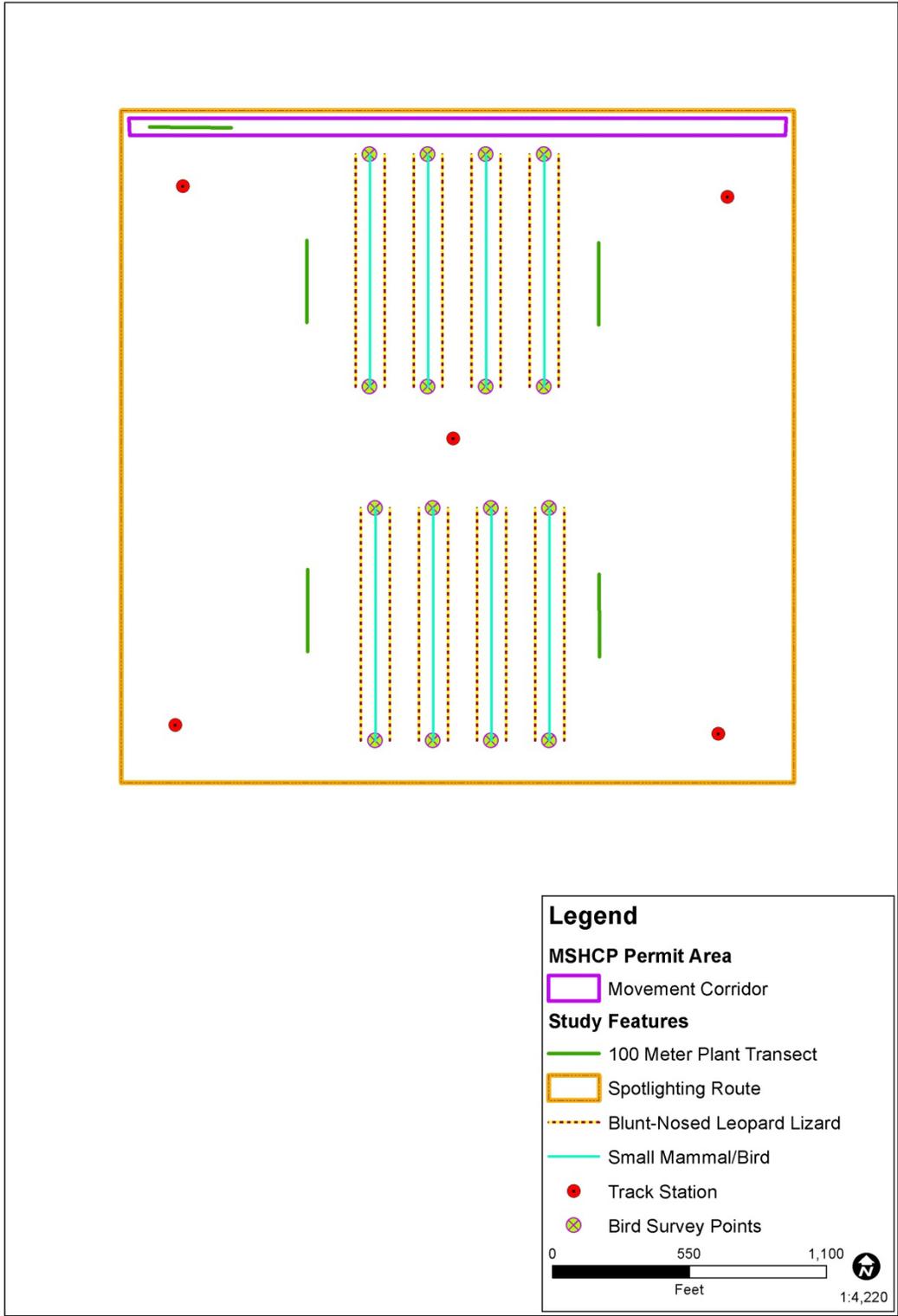
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SITE PLAN
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
6 - 1



CONCEPTUAL STUDY PLOT CONFIGURATION
FOR LONG-TERM MONITORING
STUDIES ON THE COVERED LANDS

Figure
6 - 2

A simple random sampling approach will be employed on study plots established on the Conservation Sites. All species will be noted, and the percent cover contributed by each species will be estimated using a modified Daubenmire cover scale (Bonham 1989). Total percent cover of all vegetation within the quadrant will be estimated using the same cover scale. When identification to species level is not possible, species will be assigned morpho-species names (e.g., "unknown *Atriplex*," "unknown with red cotyledons"). The height of annual vegetation will be measured at 3.28-foot intervals along each transect. The height of shrubs intersecting the transect will be measured, identified to species, and shrub cover will be determined. Shrub cover will be calculated by measuring the distance between locations where shrubs and transects intersect and dividing the total by the length of the given transect. Representative digital 35 mm photographs will be taken at each end of each plant transect to provide a record of vegetation conditions occurring on each Site. In addition to plant transects established on the study plots, two supplemental transects will be established along each of the one-mile long Movement Corridors.

Small Mammal Trapping

Small mammal trapping will be conducted along four trapping lines established on each study plot in April and October of each sampling year. Each trapping line will be approximately 984 feet long, each containing 20 traps spaced at 49-foot intervals, resulting in a total of 80 Sherman™ live-traps on each plot. Traps will be checked for four consecutive nights each trapping period. Traps will be opened before sunset and baited with a mixture of proso millet, cracked oats, and peanut butter. All traps will be checked at approximately 0200 hours and closed for the night. All animals captured will be identified to species; and their sex, sexual condition, and weight will be recorded. Each animal captured will be marked by clipping a patch of fur on its hindquarters to determine newly captured animals from recaptures. Animals will be released immediately after processing.

Bird Surveys

Each of four transects established on each study plot will be walked on four consecutive survey days in January, April, July, and October. Transects will be surveyed during the first 3.5 hours after sunrise, on days when there is no rain and the wind speed is below 10 mph. Each transect survey will be uniformly time-constrained to standardize the level of search effort expended. A biologist familiar with the songs, calls, and visual characteristics of the birds of the region will identify to species every bird seen or heard within 164 feet of each transect line. During the transect surveys, point-counts will be conducted at each end of each transect, with five minutes being spent at each point. All birds seen or heard will be tallied for each point sampled.

Reptile Surveys

Eight transects approximately 984 feet long, spaced at intervals of approximately 100 feet on each study plot, will be walked for twelve survey days between April 15th and July 15th. Sampling will be conducted on no more than two periods of four consecutive days each on any given plot. Transects will be walked in the morning hours when temperatures are between 77 and 95 degrees F and wind speeds are less than 10 mph. Each transect survey will be uniformly time-constrained to standardize the level of search effort expended and will follow standard grid

survey protocols (Tollestrup 1979). Biologists familiar with the herpetofauna of the region will thoroughly search the area within 50 feet of each transect, identifying all individuals detected to species and recording the GPS location of each animal found. Sightings of Nelson's antelope squirrels will be recorded during this survey.

Track and Camera Stations

Track stations will consist of a 3.28-foot-diameter area covered with fire clay or dolomite on which imprints of tracks can be seen. Each station will be baited in the center with a can of cat food. Each track station will be equipped with a digital camera that is activated by an infrared trigger and a motion sensitive trigger. Each track station will be inspected for tracks and digital images will be downloaded on a daily basis for four consecutive days during January, April, July, and October of each monitoring year. All photographs will be archived and reviewed to produce a tally of species visiting the stations.

Track and camera stations will not be associated directly with the study plots, but instead, 42 stations will be established in the locations shown on Figure 6-2. Additionally, each artificial den installed will be evaluated to determine use by San Joaquin kit foxes. To accomplish this evaluation, digital cameras with infrared and motion sensitive triggers will be established at each den and monitored for three consecutive nights during each of the four survey periods each year that sampling is performed.

6.4 Adaptive Management Strategy

Adaptive management is defined as the use of new information gathered from a monitoring program or from other sources to adjust management strategies and practices to improve conservation of a Covered Species (California Fish and Game Code 2805[a]). The federal rules and regulations require that adaptive management programs address all foreseeable biological and environmental changes, and that programs be designed so that new applicable scientific information and information developed through monitoring efforts are incorporated into the conservation plan. Under adaptive management, the MSHCP's conservation strategies will be monitored and analyzed to determine if they are producing the desired results (e.g., providing for movement of species through the Solar Sites, providing expansion of use by Covered Species into previously disked areas). If the desired results are not being achieved, then adjustments in the management actions will be made to achieve the stated Project goals and objectives (Chapter 5).

Adaptive management will be used in this MSHCP to adjust management actions and to modify management programs in response to information gained through biological monitoring. Management actions will be adapted to conform to changing conditions and data compiled from research, monitoring, and evaluation of data. Results of research, monitoring, and evaluation of data will be communicated by the Project administrator to the USFWS and to all solar developers. The USFWS will be consulted prior to implementing modifications to specified management actions. The decision to adapt management strategies based upon evaluation results may involve: A) adjusting management strategies; B) defining further conservation measures; C) modifying or adopting additional monitoring and research criteria; and D) changing management policies.

In general, the Monitoring Agent (see description in Chapter 8) will assess monitoring data and develop management strategies to better meet Project goals and objectives (Chapter 5). For example, species presence and relative abundance will be assessed in relation to vegetation characteristics. Subsequently, subject to review and approval by the USFWS, management activities will be adjusted to allow for development of vegetation communities that are most likely to be beneficial for Covered Species. The geo-database will be developed depicting locations of Covered Species and location of impacts to Covered Species. Covered Species locations and impacts will be assessed annually to determine when and where adjustments to project measures and other minimization efforts will be needed.

7.0

REPORTING

7.0 REPORTING

Reporting for the Maricopa Sun Solar Project will include reporting on compliance with the avoidance and minimization measures incorporated into the HCP, reporting to document the effects of the HCP on Covered Species, and reporting to document the effectiveness of the HCP. Compliance monitoring during the pre-construction, construction, operations and maintenance, and decommissioning phases will be ongoing, but at a level commensurate with project activities.

During pre-construction and construction monitoring, daily reports will be prepared by on-site monitors, and monthly summary reports will be prepared. A final report covering monitoring activities will be prepared at the end of construction, once a solar project is on-line and producing power. During the operations and maintenance phase, daily reports will be prepared by monitors, and monthly summary reports will be prepared.

Daily compliance monitoring reports will contain the date, personnel and location of assignments, a summary of the events and activities of the day, the status of issues from previous reports, descriptions of incidences, violations, and critical success factors, and a description of upcoming and planned events. All information provided in the daily reports will be uploaded into the project's geo-database. Daily reports will be made available to the USFWS upon request, but any instances of take of individuals of Covered Species will be reported to the USFWS by phone within 24 hours and in writing within five working days.

Monthly reports will be prepared during pre-construction, construction, and decommissioning phases and semi-annual reports will be prepared during the O&M phase. Monthly and semi-annual reports will consist of summaries of daily reports. In addition to containing information on compliance with avoidance and minimization measures, monthly reports will also contain information on upcoming, planned solar development projects, the cumulative tally of disturbances (habitat impacts) resulting from projects, and the amount and location of compensatory habitat provided, along with an analysis of dedicated, remaining compensatory lands. This ongoing tracking mechanism will provide documentation that compensatory mitigation is being provided at a rate that exceeds impacts. Monthly reports will also contain information on biological surveys and studies conducted within the Permit Area and management actions implemented on Conservation Sites. Weekly and monthly reports will be submitted to the Sacramento Fish and Wildlife Office to ensure that USFWS staff remains fully informed about the progress of development, the impacts associated with that development, incidences or violations that have occurred, and the establishment of conservation lands.

Annual reports will consist of information compiled from queries of the geo-database and information taken from the weekly and monthly reports. The reports will include:

1. A summary or list of Covered Activities accomplished during the reporting year. These activities will include pre-construction, construction, operations and maintenance, decommissioning, preservation and enhancement actions, as well as Conservation Plan management and activities;

2. An analysis of project impacts by impact type (e.g. number of acres graded; number of PV panels constructed; number, location, and acreages of staging areas, etc.);
3. An analysis of conservation land placed under easement prior to solar project development by solar project; (e.g. number of acres, location, date easement(s) recorded, etc.);
4. An analysis of the take of Covered Species habitat by species and by project;
5. Descriptions of any observed injuries or mortalities to Covered Species and the disposition of animals or carcasses. Information provided will include cause of take, form of take, take amount, location and date of take, and deposition of dead or injured individuals. Although instances of direct injuries or mortalities will be immediately reported, the annual report will compile and summarize these instances and evaluate these instances relative to the effects and effectiveness of the HCP;
6. A summary of all compliance monitoring that was conducted, including locations, personnel, activities monitored, and results of the monitoring including incidences and violations, and recommendations;
7. A summary of studies and surveys that were performed on the Solar Sites, Movement Corridors, and on the Conservation Sites, and the findings of those studies;
8. An evaluation of the effects and effectiveness of the HCP based upon all compiled data;
9. Descriptions of changes to the management strategy that were approved by the USFWS throughout the year, and descriptions of circumstances and recommendations for implementing any additional changes in management strategy based on the adaptive management process; and
10. Description of any changed or unforeseen circumstances that occurred and how they were addressed.

Annual reports will be provided to the Sacramento Fish and Wildlife Office by December 31st each year. Each annual report will cover all solar development projects and all activities on active Conservation lands. Maricopa Sun Solar, LLC will be responsible for gathering and disseminating this comprehensive information.

8.0

PLAN IMPLEMENTATION

8.0 PLAN IMPLEMENTATION

The MSHCP will be implemented under a Section 10(a)(1)(B) permit issued by the USFWS to the Project Administrator. The permit term will be 35 years, and will encompass Covered Activities up to and including the decommissioning process of the solar facilities. This chapter presents an overview of how the MSHCP will be implemented, the phasing of solar development over the entire project site, and how compliance with the terms and conditions of the MSHCP will be achieved and enforced for all independent third party solar developers and their subcontractors (collectively, Developers) within the Maricopa Sun Solar Complex. Assurance of compliance with the MSHCP will be achieved through biological and Project monitoring carried out by a USFWS (and CDFW) approved, third-party biological monitor (Monitoring Agent). Project phasing is described in this chapter to elaborate on the process of establishing compensatory mitigation lands along with development of the solar facilities over the first 8-10 year period. To account for the long permit term, changed circumstances and unforeseen circumstances are discussed, followed by an explanation of potential modifications of the MSHCP. “Changed circumstances” (Section 8.3) are those circumstances that can reasonably be predicted to occur, and therefore will have established contingency plans to address the changes. “Unforeseen circumstances” (Section 8.4) cannot be predicted and so, under the "No Surprises Rule," the Project Administrator is not liable for substantial or adverse changes in the status of Covered Species. “Modification of the Plan” (Section 8.5) refers to the process of applying for an amendment to the MSHCP.

8.1 MSHCP Compliance

The various Developers will adopt and implement the requirements of the MSHCP. The Project Administrator will administer compliance with the minimization, avoidance, and mitigation measures outlined in the MSHCP. Administration will be accomplished by contracting with a USFWS approved, third-party biological monitor (Monitoring Agent). The Monitoring Agent will provide compliance, effects, and effectiveness monitoring as outlined in this MSHCP, the Interim Habitat Management Plan (IHMP), and the LTHMP. In addition, the Developers will make financial commitments and assurances, paid directly to the Project Administrator, to ensure compliance with the MSHCP. The Project Administrator will not transfer any of its administrative responsibilities under the MSHCP, unless the MSHCP is amended in writing and approved by the USFWS (Section 8.5).

8.1.1 EASEMENT AGREEMENT

An Easement Agreement will be entered into by the titleholder(s) of the conservation lands and solar project lands for purposes of establishing conservation easements thereon. No such titleholder will have any liability associated with the MSHCP or solar development portion of the Project, including with respect to the USFWS (or other relevant governmental agency), Project Administrator, each Developer that develops a project on any of the acreage located within the Maricopa Sun Solar Complex, or the Monitoring Agent.

8.1.2 ENDOWMENT AGREEMENT

An Endowment Agreement will be entered into between the Project Administrator and a designated non-profit organization (Non-Profit Entity) to ensure management and conservation of the project lands in perpetuity. The Project Administrator will contribute funds on a phased basis as each solar facility is developed. In addition, the Endowment Agreement sets forth the mechanisms for distributing funds from the endowment to pay for agreed-upon long-term monitoring and maintenance services.

8.1.3 COMPLIANCE AGREEMENT

A Compliance Agreement will be entered into under which each Developer agrees to adopt and implement the requirements of the MSHCP. The primary purpose of the Compliance Agreement is to bind each Developer to the terms and conditions of the MSHCP by such Developer's adoption and implementation of the MSHCP requirements through contract. In addition, the Compliance Agreement will provide for financial and other security mechanisms to mitigate the risk of a Developer failing to perform. The Compliance Agreements will consist of various assurances, including the following:

MSHCP Adoption

This component of Project implementation specifically includes compliance by each Developer with the minimization, avoidance, and mitigation measures specified in this MSHCP. Specifically, this assurance provides that: 1) each Developer will accept the implementation of construction and biological monitoring to ensure all construction activities are compliant with the MSHCP minimization, avoidance, and mitigation measures; and 2) each Developer will accept the implementation of all conservation management activities outlined in their respective HMPs (Interim and Long-term), which will be carried out during the 35-year MSHCP permit period and in perpetuity.

Assurances of meeting MSHCP requirements will include the following:

- The Project Administrator, in consultation with the Monitoring Agent, will ensure that the final project design is compliant with the Project description and Covered Activities outlined in the MSHCP;
- The Developer will ensure that all employees, subcontractors, delivery drivers, and other personnel that may visit and/or work on site subject to that Developers solar project have completed and signed the Environmental Education Program (EEP) training (Chapter 2, Section 2.3.5);
- The Project Administrator and Monitoring Agent will enter into a Monitoring Agreement and the Developer will comply with the Monitoring Agreement. The Monitoring Agreement will establish implementation of the following monitoring activities:
 1. Compliance Monitoring: Monitoring of construction activities to ensure the implementation of minimization and avoidance measures during pre-construction,

construction, O&M, decommissioning, and conservation land enhancement activities within the Permit Area as outlined in Chapters 2 and 6;

2. Effects Monitoring: Monitoring the effects of implementation of this MSHCP on Covered Species within the Permit Area as detailed in Chapter 6; and
 3. Effectiveness Monitoring: Monitoring the progress of the conservation strategy in meeting the biological goals and objectives of the conservation program outlined in this MSHCP.
- The Monitoring Agent's primary responsibility under the Monitoring Agreement is to monitor the Developer's compliance with the MSHCP. Compliance with the MSHCP relates to development of solar facilities, compliance with all minimization, avoidance, and mitigation measures, and to monitoring of the Non-profit Entity's compliance with respect to carrying out the conservation program outlined in the MSHMP (Appendix C); and
 - The Project Administrator will enter into an agreement with a Non-profit Entity under which the Non-profit Entity adopts and implements all mitigation measures outlined in this MSHCP and pertaining to the HMPs (Interim and Long-term). Such plans will be carried out by the Non-profit Entity during the 35-year MSHCP permit period and in perpetuity.

Financial Assurance

A financial agreement between the Project Administrator and the Developer will be established to guarantee reimbursement for monitoring, management, and endowment funding. This financial agreement will provide assurances for the following MSHCP requirements:

- Commitment from the Developer to pay for its proportionate share of monitoring, management, and administrative expenses. More specifically, the Project Administrator's and Monitoring Agent's fees will be paid via a combination of ongoing reimbursements to the Project Administrator from each Developer under the Compliance Agreements for obligations set forth in this MSHCP, and releases of funds under the Endowment Agreement for long-term conservation obligations;
- Commitment from each Developer to contribute its proportionate share of the endowment funding requirements under the Endowment Agreement; and
- Requirement for each Developer to either deposit with the Project Administrator cash in an agreed-upon amount or establish a letter of credit payable to the Project Administrator as security for its performance under the Compliance Agreement (or post other acceptable security).

Compliance

This component of the Compliance Agreement provides the Project Administrator a right to intervene in the event that the Developer fails to comply with the terms and conditions of this

MSHCP, which it may do in consultation with the Monitoring Agent at the applicable Developer's expense. The following rights will be maintained:

- Grant of rights to Project Administrator to cure any Developer's failure to comply with the MSHCP;
- Grant of step-in rights to Project Administrator triggered by certain material defaults of Developer under this MSHCP; and
- Grant of a lien right to Project Administrator on agreed-upon assets of the Developer (subject to any subordination requirements of Developer's other creditors).

8.1.4 TRANSFER OF RESPONSIBILITIES

The Project Administrator will notify and receive approval from the USFWS of any transfer of responsibilities pertaining to administration of conservation easements or any other obligations under the MSHCP. Once the Project has been decommissioned, transfer of project administration responsibilities for the LTHMP tasks may occur upon approval by the USFWS. All responsibilities of the LTHMP will be assumed by the new management entity as outlined in this MSHCP for the Project Administrator. No other transfers of responsibility under the MSHCP will be considered.

8.2 *Project Phasing*

Project phasing for the Maricopa Sun Solar Complex will occur such that all obligations for project mitigation will be met prior to development of the Solar Sites. Because of the uncertainty of the progress of solar development and because of the high cost of implementing the conservation program and associated management, implementation of the conservation program will be phased accordingly to coincide with development of solar facilities. Implementation of the conservation program, including establishing conservation easements on Solar Sites and Conservation Sites, establishing Movement Corridors, and performing enhancements on Conservation Sites and Movement Corridors, will be directly tied to the impacts of each individual solar facility development, and the phasing of conservation actions will be conducted in a manner that precedes and fully meets the requirements for individual site development. Conservation easements will be recorded on Conservation Sites in order of priority according to the conservation value of the land with respect to benefits to Covered Species (Table 8-1).

The Project will progress by six phases (Table 8-2), each incorporating additional solar development lands (onsite lands or Solar Sites) and conservation lands (offsite lands or Conservation Sites). Conservation Sites will be recorded with conservation easements at a final ratio of 0.5:1 of off-site Conservation Sites to Solar Sites. Each of the six phases will provide conservation lands at different ratios (ranging from 0.6:1 up to 0.9:1, with all conservation lands being encumbered prior to Phase 6). This phasing of the encumbrance of conservation lands ensures that the dedication of conservation easements coincides with solar facility development, and to provides conservation lands in a manner that follows the priority value of the lands. There

is the added benefit of simplifying management and reducing costs by providing conservation lands in large contiguous blocks.

**Table 8-1
Offsite Conservation Sites Ranking,
Maricopa Sun Solar Complex, Kern County, California**

Property	Acreage
9-C	180.6
10-C	176.2
1-C	656.6
17-C	647.7
3-C	80.4
3-C2	152.9

**Table 8-2
Phasing Plan for Conservation Easements,
Maricopa Sun Solar Complex, Kern County, California**

Phase	Developed	Compensation		Conserved		Remaining	
		Onsite	Offsite	Onsite	Offsite	Onsite	Offsite
1	640	640	356.8	640	356.8	3158.2	1537.6
2	640	640	420	1280	776.8	2518.2	1117.6
3	640	640	380	1920	1156.8	1878.2	737.6
4	640	640	380	2560	1536.8	1238.2	357.6
5**	640	640	357.6	3200	1894.4	598.2	0
6**	598.2	598.2	0*	3798.2	0	0	

Note: Total off-site Compensation Land: 1,894.4, Total Developed Land: 3,798.2

*All offsite conservation land placed under easement prior to Phase 5, resulting in no offsite compensation for Phase 6

**Amount of offsite compensation and development land reduced in Phase 5 and 6 due to amount of remaining available land.

At the initiation of Phase 1, 356.8 acres of Conservation Site lands composed of Site 9-C and 10-C will be recorded with a conservation easement, and 640 acres of Solar Site lands will be made available for solar development. A conservation easement will be placed on all 640 acres of Solar Site lands prior to the start of construction. Therefore, phase 1 will involve recordation of conservation easements totalling 996.8 acres of Project lands.

Phase 2 will be initiated once all 640 acres of Phase 1 Solar Site lands have been developed and/or an individual solar developer anticipates the need for more land than was provided for in Phase 1 (i.e. once solar development is planned on the 641st acre). Phase 2 will involve the recordation of 420 acres of off-site Conservation Site lands and 640 acres of Solar Site lands, for a total of 776.8 acres of conservation easements. Thus, by the time Phase 2 is reached, a total of 2,056.8 acres of land will be in conservation easement (1,280 acres of solar land and 776.8 acres of off-site conservation land).

Phasing will continue in this fashion for Phases 3 to 6 according to the plan outlined in Table 8-2, eventually incorporating all Soar Site lands for solar development, and recording conservation easements on all Solar and Conservation Site lands (Table 8-2). Phase 5 incorporates lesser amount of Conservation Site lands (357.6) only because that constitutes the remainder of available compensation land, leaving no Conservation Site lands to be incorporated during Phase 6. Phase 6 incorporates only 598.2 acres of Solar Site lands, representing the remainder of available land for solar development. Based upon this type of phasing, all 5,692.6 acres of compensatory conservation lands would be encumbered prior to development of the final solar facility.

Initiation of Phase 1 is planned to begin immediately after procurement of all permits (including the subject MSHCP and state ITP) and approval of required plans. Construction of solar facilities on all Solar Sites is anticipated to be completed over an 8- to 10-year period from the commencement of the initial development. Unknown constraints, however, could extend development of all Project lands to a 10- to 15-year period. It is anticipated that complete development of each solar facility within the Project will take 9 to 18 months, depending on the acreage of the facility, weather conditions, labor and equipment availability, and time of year. There is a high potential for multiple solar developers to be installing solar facilities at various sites simultaneously. The operational life of each solar facility is anticipated to span a period of up to 25 years, during which routine operations and maintenance activities and repairs will be implemented. Decommissioning will occur prior to the expiration of federal and state take permit coverage.

Based on the lifespan of solar equipment and the anticipated phased development of the Solar Sites (yellow parcels, Figure 1-2), the duration of this MSHCP, and the associated take coverage to be issued by the USFWS, is 35 years. All sites that are developed within the Maricopa Sun Solar Complex will be subject to the terms and conditions of the MSHCP over the permit duration. A 35-year permit is needed to allow for the phased development of the project (build-out is anticipated to occur over a 10- to 15-year period), to allow for operation of the solar facilities (estimated at a productive life span of 25 years), and to allow for decommissioning of the solar facilities. The 35-year permit term will provide adequate time to implement the MSHCP and to achieve the benefits of its conservation program (USFWS, 1996).

Off site Conservation Sites will be managed for the benefit of Covered Species immediately upon recordation of the conservation easement on those lands. Solar Sites will be placed in conservation easements prior to the start of construction, but will not be managed for the benefit of Covered Species until after decommissioning of the solar facilities. During the 35-year life of the Project, Solar Site lands will be managed for the benefit of solar operations, but it is anticipated that some Covered Species will become established and derive benefits from these lands.

Management of the Conservation Sites will be conducted following the HMP (Appendix C). After the Project has been decommissioned and once all Success Criteria have been met, the conservation easements will need to be maintained in perpetuity. Routine maintenance on the conservation lands will involve:

- Vegetation density management to maintain suitable conditions for Covered Species;
- Noxious weed control to maintain habitat integrity; and
- Maintenance of fencing on an ongoing basis.

Phasing of the implementation of this conservation program and associated enhancements and management of lands will be monitored and reported as part of the MSHCP compliance monitoring and reporting effort (see Chapter 6). An example development plan, including Covered Activities specific to an individual Developer and the associated monitoring and reporting program, is provided in Appendix J.

8.3 *Changed Circumstances*

Changed circumstances are defined by federal regulation (50 CFR § 17.3) as changes in circumstances affecting a species or geographic area covered by an HCP that can reasonably be anticipated by the Project Administrator and the USFWS, and for which contingency plans can be prepared. The No Surprises regulation requires that the Project Administrator response to changed circumstances through additional conservation or mitigation be limited to those measures that are defined in the MSHCP.

8.3.1 IDENTIFICATION OF CHANGED CIRCUMSTANCES

The occurrence of a changed circumstance may become apparent through data compiled during effectiveness monitoring. Additionally, changed circumstances may be recognized through scientific study or the application of technology, and by notification of another party. Upon identification or notification of a potential changed circumstance, the Project Administrator, in consultation with the Monitoring Agent, will take immediate actions to investigate and confirm the occurrence. If a changed circumstance is identified, the Project Administrator, through the Monitoring Agent, will immediately notify the USFWS to confirm the changed circumstance.

After establishing that a changed circumstance has occurred, the Project Administrator, in consultation with the Monitoring Agent, will coordinate with the USFWS to determine remedial actions that are consistent with the conservation program, and goals and objectives described in Chapter 5 of this MSHCP. For actions implemented through the adaptive management program (Chapters 5 and 6), the decision-making process therein described will be used. Remedial actions implemented as a result of changed circumstances will be monitored in accordance with the effectiveness monitoring program described in Chapter 6, and reported as described in Chapter 7.

8.3.2 CHANGED CIRCUMSTANCES ADDRESSED IN THIS HABITAT CONSERVATION PLAN

Circumstances that may occur during the life of the permit and that may cause the conservation program to be adjusted through the use of adaptive management are:

- *Newly Listed Species*

Over the course of MSHCP implementation (35 years), the USFWS may list as threatened or endangered under the FESA species that are not covered under the MSHCP. If a non-covered species becomes listed, the following remedial measures will be taken:

- The potential impacts of Covered Activities on the newly listed species will be evaluated by the Monitoring Agent, including an assessment of the presence of suitable habitat in impacted areas; and
- The Project Administrator, in consultation with the Monitoring Agent, will develop measures to fully avoid impacts to the newly-listed species until the MSHCP is amended to cover the species.

Should a species not covered by the MSHCP be listed, proposed, or petitioned for listing, the Project Administrator may pursue an amendment and request that the USFWS add the species to the Section 10(a)(1)(B) permit. In determining whether or not to seek incidental take coverage for the species, the Project Administrator, in consultation with the Monitoring Agent, will consider whether the species is present in the permit area and if otherwise lawful activities could result in incidental take of the species. If incidental take coverage is desired, the MSHCP and permits could be amended. Alternatively, the Project Administrator could apply for new and separate permits. Procedures for amendments to the MSHCP are outlined below.

- *Introduction of non-native or invasive species*

The Project Administrator, through the adaptive management process described in Chapters 5 and 6, will identify and implement measures to reduce, avoid and/or control the effects of non-native species on the beneficial functions provided by habitat restoration under the MSHCP. If methods used to reduce and/or control adverse effects of non-native species are not effective, the Project Administrator will identify alternate design, implementation and management approaches to reduce, avoid and/or control the effects of non-native species on the beneficial functions provided by habitat.

- *Global climate change*

During the life of the MSHCP, scientific information may determine that the effects of global climate change on Covered Species and their habitat may be of greater significance or magnitude than anticipated in this MSHCP and as identified in the conservation strategies implemented. These changes have the potential to yield conservation strategies described in Chapter 5 to be ineffective.

In the event of changed circumstances due to global climate change, actions described in the adaptive management program would be undertaken; however, should these identified actions be determined by the Monitoring Agent to be ineffective in avoiding and/or reducing the amount of take, the Project Administrator, in consultation with the Monitoring Agent, will coordinate with the USFWS to determine remedial actions that are consistent with Conservation Actions described in Chapter 5.

- *Fire, Drought, Flooding and/or Other Weather Events*

A fire could occur in the Project area due to the generally dry climate and conditions. Drought or flooding could also occur due to the high variability in rainfall patterns in the area. Outbreak of fire, drought or flooding, and subsequent loss of vegetation and soil erosion could alter the habitat in such a way that the Project area becomes less suitable for Covered Species. Additionally, on-site mitigation/restoration actions could be damaged or destroyed. In the event of such changes, the Project Administrator, in consultation with the Monitoring Agent, would restore vegetation, stabilize and control erosion, and repair damage to the artificial berms, dens, perches, or other habitat components constructed on the property in accordance with habitat enhancement measures outlined in this MSHCP (Chapter 5) and the HMPs (Appendix C). The Project Administrator would implement these actions as soon as possible. Therefore, these changes are provided for in this MSHCP and do not constitute unforeseen circumstances or require the amending this MSHCP.

8.3.3 FUNDING OF ACTIONS NECESSARY DUE TO CHANGED CIRCUMSTANCES

In the event that changed circumstances are encountered during the life of the MSHCP, the Project Administrator will have in place means to address additional incurred costs. Costs incurred by the Project Administrator associated with a particular Developer will be passed on to the Developer through agreements arranged between the Project Administrator and the Developer. Changed circumstances resulting in additional costs in habitat management requirements (Appendix C) will be covered with the conservation easement endowment. Specific details of Project funding are covered in Chapter 10.

8.4 *Unforeseen Circumstances*

Unforeseen circumstances are defined by federal regulation (50 CFR § 17.3) as changes in circumstances that affect a species or geographic area covered by an HCP that could not reasonably be anticipated by Developers and USFWS at the time of the HCP's negotiation and development, and that result in a substantial and adverse change in status of the Covered Species. The No Surprises rule provides assurances to non-federal landowners participating in habitat conservation planning under the FESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the Project Administrator.

In case of an unforeseen event, the Project Administrator, through the Monitoring Agent, will immediately notify the USFWS staff member who functions as the principal contact for the Project. In determining whether such an event constitutes an unforeseen circumstance, the USFWS will consider, but not be limited to, the following factors: size of the current range of the affected species; percentage of range adversely affected by the MSHCP; percentage of range conserved by the MSHCP; ecological significance of that portion of the range affected by the MSHCP; level of knowledge about the affected species and the degree of specificity of the species' conservation program under the MSHCP; and whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

If the USFWS determines that additional conservation and mitigation measures are necessary to respond to the unforeseen circumstances where the MSHCP is being properly implemented, the additional measures required of the Project Administrator must be as close as possible to the terms of the original MSHCP. Additional conservation and mitigation measures that involve the commitment of additional financial compensation or restrictions on the use of land or other natural resources otherwise available for development or use under original terms of the MSHCP will occur only with the consent of the Project Administrator.

8.5 Modifications to the Plan

Amendment of a section 10(a)(1)(B) permit is required when significant modifications are made to a project, activity, or conservation program as described in the original HCP. All amendments to an HCP require that the HCP be submitted to the USFWS in writing. The USFWS must subsequently review and approve the amendments and respond to the applicant in writing. Amendments may be defined in scope as “minor” or “major” as described below.

8.5.1 MINOR AMENDMENTS

Minor amendments are changes that do not affect the scope of the HCP’s impact and conservation strategy, change amount of take, add new species, or change significantly the boundaries of the HCP. Examples of minor amendments include correction of spelling errors or minor corrections in boundary descriptions. The minor amendment process will be accomplished through an exchange of letters between the Project Administrator and the USFWS’s Field Office.

8.5.2 MAJOR AMENDMENTS

To amend the Section 10(a)(1)(B) permits, the Project Administrator will submit a formal application to the USFWS. This application must include a revised HCP, a permit application form, any required fees, a revised Implementing Agreement, and the required compliance document under NEPA. The appropriate NEPA compliance process and document will depend on the nature of the amendment being proposed. A new scoping process may be required, dependent upon the nature of the amendment. If additional scoping is deemed appropriate and necessary, the USFWS will publish a Notice of Intent in the Federal Register to initiate the scoping process. Upon submission of a completed application package, the USFWS will publish a notice of the proposed application in the Federal Register, initiating the NEPA and HCP amendment review process. After public comment, the USFWS may approve or deny the permit amendment application.

9.0

ALTERNATIVES

9.0 ALTERNATIVES

Section 10(a)(2)(A) of the FESA requires applicants to consider alternative actions to the take of federally listed species and explain the reasons why those alternatives were not selected. The discussion below considers such alternatives as well as a “no action” alternative in which no incidental take permit would be issued.

9.1 *No Action Alternative*

Under the No Action Alternative, an Incidental Take Permit would not be issued for take of Covered Species and the Project would not occur. There would be no potential for take of Covered Species because construction, operations, maintenance or decommissioning activities would not occur. The 5,784.3 acres identified as the Permit Area would likely remain vacant, and be managed in a farm-ready state, and converted to actively cultivated farmland whenever an adequate water supply becomes available. The 1,894.4 acres identified as Conservation Sites would not be permanently conserved and the proposed Conservation Management Plan would not be implemented as mitigation; thus, there would be no conservation benefit to Covered Species or other listed or sensitive species as a result of the Project.

Under the No Action Alternative, agricultural activities in the Permit Area could include continued disking, grazing, or agricultural production. Grazing and disking reduces habitat quality as a result of vegetation removal and soil compaction (Rathbun et al. 1997). Agricultural production would similarly reduce habitat quality. The No Action Alternative would fail to contribute towards achieving California’s renewable energy goals and fail to achieve the energy production goals of the project. Therefore, the No Action Alternative is rejected in favor of the proposed Project.

9.2 *Alternative 2: Reduced Permit Area*

Under Alternative 2, the Permit Area would be reduced from 5,784.3 acres to 3,682 acres by removing from the Project Sites 4-S/4-M (652.5 acres), 6-S (320.9 acres), 7-S/7-M (481.2 acres) and 17-C (647.7 acres). The lands excluded from the Permit Area would likely remain vacant and would continue to be disked on a regular basis for weed control. If water became available, these lands would likely be converted to active agricultural production.

Under Alternative 2, there would be fewer adverse effects to Covered Species than under the proposed Project because construction, operations, maintenance and decommissioning activities would occur over a smaller area. However, less land would be permanently conserved and managed, resulting in fewer benefits to the Covered Species. Alternative 2 would contribute less towards achieving California’s renewable energy goals than the proposed Project. Furthermore, Alternative 2 would not meet the energy production goals of up to 700 MW (actual amount dependent upon technology). Therefore, Alternative 2 is rejected in favor of the proposed Project.

9.3 *Alternative 3: Gravel Site*

Under Alternative 3, the entire ground surface of Solar Development Footprints would be covered with gravel. Graveling the Solar Sites would substantially reduce the potential for Covered Species to colonize and use the Solar Development Footprints over the life of the Project, thus substantially reducing the potential for incidental take associated with the Project's O&M and decommissioning activities.

The addition of gravel would make the Solar Development Footprints unsuitable for ground squirrels that prefer finer substrates for constructing burrows; ground squirrel burrows are used for nesting by burrowing owls. Gravel would also make the Solar Development Footprints unsuitable for the Tipton kangaroo rat, blunt nosed leopard lizard, and Nelson's antelope squirrel by significantly reducing the ability of these species to construct burrows or find and occupy burrows constructed by ground squirrels. To a limited extent, San Joaquin kit fox may traverse the Solar Development Footprints, but gravel would reduce the potential for them to disperse over the sites, prevent them from denning on the sites, and significantly reduce opportunities for foraging on the sites.

Graveling the Solar Development Footprints would greatly reduce the potential for Covered Species to use and occupy the areas developed with solar facilities and would reduce the risk of take of individuals, especial during the decommissioning phase of the Project. Graveling the Solar Development Footprints would not eliminate initial take of potential dispersal and foraging habitat that will occur during the pre-construction and construction phases of the Project, and would eliminate the potential benefits to Covered Species that could come about as the Solar Development Footprints become revegetated over the life of the Project. As the Solar Development Footprints become revegetated, Covered Species could use the Sites for dispersal, foraging, and reproduction. Graveling the Solar Development Footprints would reduce the overall conservation benefits to Covered Species or other listed and sensitive species over the life of the Project.

The proposed Project provides potential benefits to Covered Species and is significantly less expensive to undertake. Under the proposed Project, some risk of incidental take of individuals does exist, but there are potential benefits to the Covered Species brought about by natural revegetation of the Solar Development Footprints. The substantial amount of exposed earth around the solar arrays that is likely to become naturally revegetated over the course of the O&M phase, combined with very low levels of human activity in and around the solar developments during the O&M phase, makes for a beneficial setting for Covered Species to potentially inhabit and benefit from the developed solar lands. These potential conservation benefits would not occur under Alternative 3. In addition to the loss of potential conservation benefits, graveling the Solar Development Footprints would be cost prohibitive due to the need to purchase, transport, and spread gravel to the 3,700.8 acres. For example, if the 3,700.8 acre Solar Development Footprint was covered with gravel 4 inches deep, it would cost approximately \$2.25 million¹ (based on information from Randall Sand and Gravel 2013), not including delivery or

¹3,788 acres = 165.5 million ft² * 0.25 ft (depth of gravel) = 41.4 million ft³ of gravel = 1.5 million yd³ of gravel
1.5 million yd³ of gravel * 1.5 tons/yd³ * \$10/ton = \$2.25 million

preparation of the Project site prior to spreading the gravel. Besides the additional cost to solar developers, there are a number of negative environmental impacts related to mining the required gravel and trucking it to the Project site, including production of greenhouse gas emissions and potential vehicle strikes with special-status species due to increased traffic.

Furthermore, the entire 3,798.3 acres of Solar Sites will be managed in perpetuity for the benefit of Covered Species beginning immediately upon initiation of solar development decommissioning. The presence of gravel on the Solar Development Footprints would greatly reduce the potential habitat value of these lands after decommissioning, greatly increase the costs of habitat enhancement and management, and greatly reduce any conservation benefits that could otherwise be realized. For all of the reasons discussed above, Alternative 3 is rejected in favor of the proposed Project.

10.0

IMPLEMENTATION COST AND FUNDING

10.0 IMPLEMENTATION COST AND FUNDING

The MSHCP will be implemented under a Section 10(a)(1)(B) permit issued by the USFWS to Maricopa Sun, LLC (Project Administrator). The permit term will be 35 years, and will encompass Covered Activities up to and including the decommissioning process of the solar facilities. This chapter presents an overview of the anticipated cost and funding mechanisms for the implementation of the Conservation Program (Chapter 5) and all portions of the Monitoring Program (Chapter 6) of the MSHCP, with the exception of compliance monitoring. Compliance monitoring assures that avoidance and minimization measures are enacted during construction, O&M, and decommissioning activities and costs will vary widely by project and construction schedules of the independent solar developers and their subcontractors (Developers) within the Maricopa Sun Solar Complex. This MSHCP stipulates a minimum level of compliance monitoring required to ensure no take occurs (Chapter 2; Appendix J), and those monitoring costs will be developed prior to the start of construction of each Project Phase (Chapter 8, Section 8.2) and will be funded by each Developer through the Project Administrator. Extensive financial analyses of projected costs to implement have been performed. The general assumptions and cost estimates are below.

10.1 *Land Acquisition*

There are multiple land types within the Project, consisting of Conservation Sites, Solar Sites and Movement Corridors. All land required for both solar development and mitigation for that development has been identified in this MSHCP (Chapter 2, Section 2.2), and is controlled by the Project Administrator. Therefore no additional land acquisition is necessary to meet development or mitigation obligations. Project phasing for the Maricopa Sun Solar Complex will occur such that all obligations for project mitigation will be met prior to development of the Solar Sites (Chapter 8, Section 8.2).

10.2 *Program Administration*

The Project Administrator will be responsible for the coordination of the MSHCP and working with the Developers, Conservation Easement Holder, and Endowment Holder to comply with the MSHCP. All costs associated with the implementation of the Compliance Monitoring, Interim Habitat Management Plan (IHMP) and Long Term Habitat Management Plan will be the responsibility of the Project Administrator. Costs shall be recuperated from each Developer related to their portion of the Project and commensurate with the Phasing Plan.

10.2.1 EASEMENT AGREEMENT

The Project Administrator will coordinate the establishment of an Easement Agreement that will be entered into by the titleholder(s) of the conservation lands and solar project lands, with a designated non-profit organization (Conservation Easement Holder) for purposes of establishing conservation easements thereon. Any funding associated with the establishment of the Easement Agreements will be provided by the Developer(s), and managed and coordinated by the Project Administrator. The Conservation Easement holder will be the grantee of the conservation easement and will provide third-party oversight to ensure compliance with the terms of the

conservation easement. The funding for the oversight activities will be paid for from the interest generated by the endowment.

10.2.2 ENDOWMENT AGREEMENT

An Endowment Agreement will be entered into between the Project Administrator and a designated non-profit organization (Endowment Holder), and the Project Administrator will require each Developer to contribute funds for purposes of managing and maintaining the conservation lands and the solar project lands on a long-term basis (managing and monitoring during the Project's life will be on a "pay-as-you-go" arrangement). The Endowment Holder will be responsible for managing the endowment and the disbursement of management funds from the endowment in accordance with Long Term Habitat Management Plan and the Endowment Agreement.

10.3 *Cost to Implement*

There are three separate types of activities and associated cost components within the MSHCP; Compliance Monitoring, the Interim Habitat Management Plan and the Long Term Habitat Management Plan. All habitat monitoring activities and funding will be coordinated by the Project Administrator and funded by the Developer(s). This Chapter is written from a Project level, because the projects of individual Developers are expected to vary in size, timing, location, etc. Any individual Developer will be responsible for funding their portion of each of the three activities, as determined by the Project Administrator.

10.3.1 COMPLIANCE MONITORING

As described above in Section 10.0, the solar development projects of individual Developers may vary in footprint, construction scale, construction duration, style, and other factors. The costs of compliance monitoring will depend on the scale of each individual solar development and will be determined prior to the start of construction. The Project Administrator will provide the Developer with the Compliance Monitoring terms of the MSHCP and the Developer will provide the Project Administrator with a construction plan and schedule. The Developer and the Project Administrator (in consultation with the Monitoring Agent) will then confer on the cost associated with the required level of Compliance Monitoring and the Developer will provide the requisite funding to accomplish the Compliance Monitoring. This funding will be provided on a pay-as-you-go arrangement.

Biological compliance monitoring will be conducted by a third-party biological consultant and will consist of several components, including pre-activity surveys, daily pre- and post-activity sweeps, and daily monitoring of work activities (Section 2.3.5). The costs associated with biological compliance monitoring will vary depending upon the scale of the solar project and the individual billing rate for a given third-party consultant. A general cost breakdown for an individual solar development can be estimated using a hypothetical solar facility development and billing rates for a typical biological consulting firm (Table 10-1).

Table 10-1
Cost Estimate for Biological Compliance Monitoring
for a Hypothetical 160-Acre Solar Development

Expense	Occurrences	Cost/ Occurrence ¹	Total Cost (160 acres)
Pre-activity surveys ²	1	\$2,989.80	\$2,989.80
Construction monitoring	220 ³	\$2,816.00 ⁴	\$619,520.00
Travel ⁵	220	\$612.00	\$134,640.00
Reporting ⁶	1	\$51,150.00	\$51,150.00
10% Admin fee			\$79,470.05
Construction subtotal			\$887,769.85
Annual O&M monitoring ⁷	12	\$704.00	\$8,448.00
Annual O&M Travel	12	\$612.00	\$7,344.00
Annual O&M Reporting ⁶	1	\$5,280.00	\$5,280.00
10% Admin fee			\$2,105.40
O&M Subtotal			\$23,177.40
Pre-activity surveys	1	\$2,989.80	\$2,989.80
Decommissioning monitoring	110 ⁸	\$2,816.00 ⁴	\$309,760.00
Travel ⁵	110	\$612.00	\$67,320.00
Reporting ⁶	1	\$27,940.00	\$27,940.00
10% Admin fee			\$40,485.50
Decommissioning subtotal			\$448,495.30
Project total			\$1,359,442.55

1. Cost/Occurrence is estimated at an hourly rate of \$88.00 for an eight hour work day.
2. Pre-activity surveys will involve 32 person hrs (4 biologists for a period of 8 hrs) + travel (@ 1 hr 30 min /75 miles round trip)
3. Construction of a 160 acre solar facility is estimated to take approximately 10 months (220 days).
4. Construction/decommissioning monitoring will involve four biologists per day for an eight hour work day.
5. Travel is estimated at one and a half hours round and 75 miles trip from Bakersfield at a rate of \$88.00 for four biologists.
6. Reporting during the construction and decommissioning phases will include monthly and final reporting; reporting during operations and maintenance will be annual.
7. Operations and maintenance activities are anticipated to occur no more than once a month on average to include expected and unexpected activities.
8. Decommissioning of a 160 acre solar facility is estimated to take approximately 5 months (110 days).

For example, for a 160-acre solar facility, pre-activity surveys (pre-construction and pre-decommissioning) will be required prior to any ground-disturbing activities (Table 10-1). Only a single pre-activity survey (pre-construction and pre-decommissioning) will be required as ground-disturbing impacts are anticipated to occur over the entire 160-acre site. In the event that a period of 14 days lapses with no activity on the site, or a portion of the site, pre-activity surveys would need to be repeated for the site, or portion of the site. Pre-activities surveys of a 160-acre solar facility can general be completed by four biologists in an eight hour work day (assuming a walking pace of roughly one mile per hour and transects spaced 100 feet apart to provide full site coverage). During all on-site activities (construction, operations and maintenance, and decommissioning), a biological monitor will be present to monitor work crews.

During peak periods of activity (construction and decommissioning), four biological monitors will be present per 160-acre solar development. Assuming eight-hour work days, travel from Bakersfield, necessary reporting to the Project Administrator, Developer, and agencies, and a 10% administrative fee, the total cost for biological compliance monitoring for a 160-acre solar facility can be estimated to be \$1,359,442.55 over the life of the solar project (approximately 35 years) (Table 10-1). This total dollar value amounts to \$8,494.47 per solar development acres.

10.3.2 INTERIM HABITAT MANAGEMENT PLAN

The Interim Habitat Management Plan (IHMP, Appendix C) describes the ecological and resource management activities that will take place on the Project during the 35 year life of the Project, as well as all necessary capital ecological improvement actions on the Project. The Project will be phased, thus, various ecological management activities may begin and end at different times throughout the life of the Project. Tables 10-2 through 10-4 outline the estimated costs for implementation of the IHMP for the Project over all 1,894.4 acres of the Conservation Sites. Prior to the development of any individual Phase of the Project, an IHMP implementation security (Security) will be provided by the Project Administrator to the Conservation Easement Holder in the form of an irrevocable standby letter of credit. The Security will be maintained in an amount sufficient to complete the 3 coming years of IHMP activities in each developed phase (Table 10-2). The first year of development of any individual Phase will require a greater Security amount, because of capital improvement costs in Year 1 (Year 1 LOC), but then following completion of the capital improvement activities, the Security will decrease to and be maintained at for the duration of the Project, a level sufficient to implement the 3 coming years of IHMP monitoring activities (Ongoing LOC). The Project Administrator will ensure that the appropriate amount of Security will remain in effect throughout the duration of the Project. Specific details of the Security calculation can be found in Appendix C (IHMP) of the HCP.

**Table 10-2
Interim Habitat Management Plan – Phased Security Summary**

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Construction Cost	\$181,282	\$146,322	\$105,329	\$86,502	\$146,005	\$ -
Annual Monitoring Cost	\$27,034	\$42,390	\$58,907	\$74,457	\$91,168	\$91,168
Tier 2 Monitoring Cost	\$72,600	\$130,680	\$174,240	\$203,280	\$232,320	\$261,360
<u>Year 1 LOC*</u> (3 years of IHMP activities w/ construction)	\$480,183	\$665,531	\$804,771	\$919,712	\$1,116,469	\$1,057,584
<u>Ongoing LOC**</u> (3 years of IHMP activities, no construction)	\$298,901	\$519,209	\$699,442	\$833,210	\$970,464	\$1,057,584

*Calculated by adding “Construction Cost” to 3 years of “Annual Monitoring Cost” and 3 years of “Tier 2 Monitoring Cost”

**Calculated by adding 3 years of “Annual Monitoring Cost” and 3 years of “Tier 2 Monitoring Cost”

10.3.3 LONG TERM HABITAT MANAGEMENT PLAN

The Long Term Habitat Management Plan (LTHMP, Appendix C) describes the ecological and resource management actions that will take place initially on the Conservation Sites, and then on all land types (Conservation Sites, Solar Sites and Movement Corridors) following decommissioning. The Project will be phased, thus, various ecological management activities may begin and end at different times throughout the life of the Project. The estimated cost for the implementation of the LTHMP was determined by a PAR-like analysis. This analysis is used to determine the amount of funding necessary to establish a non-wasting Endowment, from which, the interest generated will be sufficient to implement the LTHMP. Individual Developers will be responsible for funding a portion of the Endowment as determined by the Project Administrator. Where IHMP and LTHMP activities overlap, the Project Administrator may bill the Endowment to recover the costs of overlapping activities.

The LTHMP will initially be implemented on only the Conservation Sites, then following decommissioning; the Solar Sites and Movement Corridors will also be managed for their habitat values according to the terms of the LTHMP. The Endowment will therefore be funded in two primary intervals, according to the Phasing Plan (Chapter 8, Section 8.2); the Initial Funding will be sufficient for the management of the Conservation Sites, and then the Supplemental Funding will be added to the Endowment to extend LTHMP management activities to the decommissioned Solar Sites and Movement Corridors. The Supplemental Funding will be contributed to the endowment following the initiation of each phase in an amount such that at the time the Solar Sites are decommissioned, the Supplemental Funding will have grown sufficiently to fulfill the funding requirements for managing the Solar Sites according to the LTHMP. The Initial Funding and the Supplemental Funding will be adjusted for inflation prior to the initiation of each phase, by adjusting said phase's contributions by a percentage equal, if any, to the percentage increase in the California Consumer Price Index ("CPI", as published by the California Department of Industrial Relations), between the finalization date of this HCP and the initiation of said phase. Further, the Supplemental Funding contribution for each phase will be recalculated for the number of years remaining between the initiation of said phase and the time to decommissioning, accounting for the reduction in compounding interest periods.

Table 10-3 outlines the current year estimated Initial Funding contribution, the estimated Supplemental Funding contribution and the total funding contribution. The Initial Funding contribution is anticipated to be funded incrementally according to the construction of the Project Phases (Chapter 8, Section 8.2). Specific details of the PAR-like analysis can be found in Appendix C of the HCP (Part 2: LTHMP).

**Table 10-3
Long Term Habitat Management Plan Estimated Costs**

Land Type	Acres	Ave. Annual Cost	Capitalization Rate	Total Endowment Contribution
Conservation Site	1,894	\$57,385.88	4.00%	\$1,769,015.31
Full Project (Yr. 35)	5,784	\$160,266.47	4.00%	\$5,017,059.55
		Initial Funding		\$1,769,015.31
		Supplemental Funding		\$3,248,044.24
		Total Funding		\$5,017,059.55

**Table 10-4 (Finish updating table per PAR @ Phase 2)
Long Term Habitat Management Plan Estimated Contributions by Phase**

Land Type	Phase	Acres	Endowment Contribution	Capitalization Rate	Total Endowment Contribution
Conservation Site	1	356.8	\$824,074.74*	4.00%	\$824,074.74
Solar Site	1	640	\$138,758.40*	4.00%	\$138,758.40
Conservation Site	2	420	\$203,015.31*	4.00%	\$1,027,090.05*
Solar Site	2	640	\$138,758.40*	4.00%	\$277,516.80*
Conservation Site	3	380	\$223,052.91*	4.00%	\$1,250,142.96*
Solar Site	3	640	\$138,758.40*	4.00%	\$416,275.20*
Conservation Site	4	380	\$199,687.06*	4.00%	\$1,449,830.02*
Solar Site	4	640	\$138,758.40*	4.00%	\$555,033.60*
Conservation Site	5	357.6	\$319,185.29*	4.00%	\$1,769,015.31*
Solar Site	5	640	\$138,758.40*	4.00%	\$693,792.00*
Conservation Site	6	0	\$0.00	4.00%	\$1,769,015.31*
Solar Site	6	598.2	\$129,695.75*	4.00%	\$823,487.75*
			Initial Funding		\$1,769,015.31*
			Supplemental Funding		\$823,487.75**
			Total Funding		\$2,592,503.06**

*Phases 2 – 6 will be adjusted annually for inflation (by the change in the Consumer Price Index).

**The Supplemental Funding will be maintained and accrue interest in a separate account, to be contributed to the Initial Funding, following Solar Site decommissioning. The Supplemental Funding account is anticipated to total \$3,249,555.95, at year 35, at a 4% capitalization rate compounded annually.

11.0

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11.0 REFERENCES

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APPENDICES

Appendix A

Definitions

Appendix B

Detailed Maps of the Maricopa Sun Solar Complex

Appendix C

Habitat Management Plan, Maricopa Sun Solar Complex;
Part 1: Interim Habitat Management Plan
Part 2: Long-term Habitat Management Plan

Appendix D

Design Specifications for Artificial San Joaquin Kit Fox Dens

Appendix E

Relocation Plan for the Western Burrowing Owl

Appendix F

Relocation Plan for the Tipton Kangaroo Rat and the Nelson's Antelope Squirrel

Appendix G

Conservation Sites Evaluation Report

Appendix H

Kit Fox Dispersal Study

Appendix I

Natural History Information of Species Not Covered by the Maricopa Sun HCP

Appendix J
Monitoring Plan

APPENDIX C

**APPENDIX C
FINAL ENVIRONMENTAL IMPACT STATEMENT
RESPONSES TO COMMENTS**

Introduction

The U.S. Fish and Wildlife Service (Service) posted the Maricopa Sun Solar Complex Multi-Species Draft HCP and Draft Environmental Impact Statement (EIS) prepared for the Draft HCP in the Federal Register on May 28, 2014 for the statutory 90-day comment period. The Notice prepared by the Service announced the public comment period on the permit application, including the Draft EIS and the proposed Draft HCP. The Service requested data, comments, new information, and suggestions from the public, other concerned governmental agencies, the scientific community, tribes, industry, or any other interested party.

The Notice indicated that copies of the Draft EIS and Draft HCP were available from the Sacramento Fish and Wildlife Office website at <http://www.fws.gov/sacramento>.

As of the end of the 90-day comment period, a single comment has been received, as follows:

- United States Environmental Protection Agency, Region IX, August 22, 2014, prepared by Kathleen Martyn Goforth, Manager Environmental Review Section

This Appendix contains the single comment letter. Each individual comment in the letter has been assigned a number, noted in the right margin. Responses to each comment in the letter follow the letter. The topic, or primary subject, of each comment is paraphrased prior to each response.

Where responses to comments have resulted in a revision to the analysis contained in the Draft EIS, revisions are shown in underline and ~~strike-out~~ format in the Final EIS.

NEPA regulations direct the lead agencies, in this case the Service, to make a “good faith, reasoned analysis” in response to “significant environmental issues raised” in comments on a Draft EIS.

Comment Letter

United States Environmental Protection Agency, Region IX, August 22, 2014

Letter 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

August 22, 2014

Mr. Mike Thomas
Chief
Conservation Planning Division
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

Subject: Draft Environmental Impact Statement for the Maricopa Sun Solar Complex Multi-Species Habitat Conservation Plan, Kern County, California (CEQ # 20140155)

Dear Mr. Thomas:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the Maricopa Sun Solar Complex Multi-Species Habitat Conservation Plan (HCP or Plan) pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

The EPA appreciates the consideration given to the letter we submitted to the U.S. Fish and Wildlife Service (Service) during the scoping period for this proposed Plan. The DEIS addresses most of the questions or concerns, and incorporates many of the recommendations, included in our letter. The proposed Plan includes many elements—including the utilization of previously disturbed land, avoidance of sensitive waters, and commitment to maintain existing on-site drainage patterns—that EPA Region 9 has long espoused in our comment letters for EISs prepared for renewable energy projects.

Based on our review of the subject DEIS, we have rated the Preferred Alternative and the document as (LO-1) Lack of Objections – Adequate (see the enclosed “Summary of EPA Rating Definitions”). The EPA commends the Service for working with the project proponent to craft a Plan that includes a project footprint entirely comprised of fallowed agricultural land (land with currently low habitat value and lacking a sufficient water supply for agricultural production), wildlife corridors that will include provisions to improve habitat important to Covered Species, and a novel commitment to ultimately conserve all Covered Lands in perpetuity. These measures, along with the other avoidance and mitigation measures identified in the DEIS, should result in a solar facility with minimized impacts and enhanced habitat crucial to sustaining the Covered Species.

We recommend that the Final EIS more thoroughly discuss two topics that receive minimal attention in the DEIS. The first concerns the potential effects of climate change on the proposed Plan. The DEIS includes a laudable estimation of construction and operation emissions that would be associated with this project, as well as a qualitative discussion of the projected greenhouse gas effects from Covered Activities. It does not, however, include a discussion of how climate change may affect the Covered Species and the habitats on which they depend. The proposed period of incidental take coverage (35 years) will likely be a time of considerable change in the planning area. Consequently, we recommend that the HCP include, and the FEIS detail, provisions to monitor and reassess climate change effects on a

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range of issues, including: the status of Covered Species, including the distribution of species throughout the planning area; the success of restoration efforts; and the need for new or expanded conservation lands. We recommend that the Service develop a robust monitoring and adaptive management plan to account for, mitigate, and adapt to, the effects of climate change on the Covered Species (and the habitats that sustain these populations) throughout the period of ITP coverage.

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The second issue that we would like to see explored further in the Final EIS is the potential for Covered Activities, particularly the siting and operation of the solar panels, to lead to the deaths of avian species. The DEIS states that “limited anecdotal evidence suggests that large expanses of solar panels may contribute to migratory bird deaths,” and that “reflections from panels may attract birds in flight that mistake the broad reflective surfaces for water bodies.” The section of the DEIS devoted to this issue, however, merely concludes that the occurrence of avian mortality at utility scale solar sites is still being studied, and no reliable methods or actions have been identified that would avoid or minimize these occurrences. The EPA acknowledges that occurrences of avian mortality at utility scale solar sites was still emerging as an issue during scoping and preparation of the DEIS for this project. Since then, however, the number of solar sites (both solar thermal facilities, as well as photovoltaic, as is proposed for the Maricopa Sun Solar Complex) reporting deaths of avian species has increased dramatically. The Service’s recognition of the severity of this problem is evidenced by recent efforts by the Service and its state and federal partners to research design features and best practices to minimize and, ideally, prevent, occurrences of avian mortality at utility scale solar sites, as well as to develop a standard monitoring protocol to identify and assess these occurrences. The sheer size of the proposed project, however, portends avian mortality as a concern throughout its operational life, while the extended construction timeline warrants strong on-site monitoring. We recommend that the Final EIS include an updated discussion devoted to the occurrence of avian mortality at utility scale solar sites, informed with the best available scientific research conducted for the topic; and that the HCP include a comprehensive monitoring protocol to catalog and analyze occurrences of avian mortality, and the flexibility to adapt siting or operation of the solar panels, throughout the life of the project, in response to said research and monitoring.

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We appreciate the opportunity to review this DEIS, and are available to discuss our comments. When the FEIS is released, please send one CD copy to this office (specify Mail Code ENF-4-2). If you have any questions, please contact me at 415-972-3521, or contact Jason Gerdes, the lead reviewer for this project. Mr. Gerdes can be reached at 415-947-4221 or gerdes.jason@epa.gov.

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Sincerely,



Kathleen Martyn Goforth, Manager
Environmental Review Section

Enclosure: Summary of EPA Rating Definitions

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment

Responses to Comment letter

United States Environmental Protection Agency, Region IX, August 22, 2014

Response to Comment 1

The commenter indicates that the Draft EIS addresses most of the comments, questions and recommendations contained in the letter submitted by the U.S. EPA during the scoping period for the Draft EIS.

The comment is noted.

Response to Comment 2

The commenter indicates that the U.S. EPA has given the Draft EIS its highest rating in its two rating categories. Further, the commenter commends the Service for working with the project proponent to craft a Draft HCP that is protective of the targeted Covered Species.

The comment is noted.

Response to Comment 3

The commenter recommends that the Final EIS discuss two topics that received minimal attention in the Draft EIS. The first topic is the potential effects of climate change on the proposed plan. The commenter notes that the Draft EIS contains a laudable estimation of construction and operation emissions that would be associated with the proposed project, as well as a qualitative discussion of the projected greenhouse gas effects from Covered Activities, but does not include a discussion of how climate change may affect the Covered Species and their habitats. The commenter recommends that the HCP include, and the Final EIS detail, provisions to monitor and reassess climate change effects, and recommends that the Service develop a robust monitoring and adaptive management plan.

In response to the commenter's request, Section 4.4 of the Final EIS has been revised to include a discussion of potential climate change effects on biological resources. As noted above in the Introduction, the revised text is shown in ~~strike-out~~ and underline format. The discussion is relatively generalized due to the fact that the potential effects of climate change on the specific Covered Species addressed in the Draft HCP are not understood presently.

Response to Comment 4

The commenter indicates that the second topic that needs to be more fully addressed in the Final EIS is the potential for Covered Activities, particularly the siting and operation of solar panels, to lead to the deaths of avian species that mistake the panels for bodies of water and fly into them. The commenter adds that the severity of problem is evidenced by recent efforts of the Service and its state and federal partners to research design features and best practices to reduce this phenomenon. The commenter recommends that the Final EIS include additional discussion of the avian mortality phenomenon and that the HCP include a comprehensive monitoring protocol and an adaptive management plan to reduce avian mortality.

In response to the commenter's request, Section 4.4 of the Final EIS has been revised to include a discussion of the bird strike phenomenon and to describe an adaptive management protocol. As noted above in the Introduction, the revised text is shown in ~~strike-out~~ and underline format. The proposed revision is limited to the Draft EIS, since the phenomenon is apparently limited to migratory species and not the Covered Species addressed by the Draft HCP.

Response to Comment 5

The commenter expresses appreciation for the opportunity to review the Draft EIS and asks that a copy of the Final EIS be provided on compact disc when it is available.

The comment is noted. The Service will provide a copy of the Final EIS on CD, as requested.