

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 USWFS (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.