

**SPECIAL STATUS SPECIES NOT COVERED BY THE  
HABITAT CONSERVATION PLAN**

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**MARICOPA SUN SOLAR PROJECT,  
KERN COUNTY, CALIFORNIA**

**November 2014**

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Quad Knopf

# **SPECIAL STATUS SPECIES NOT COVERED BY THE HABITAT CONSERVATION PLAN**

## **Maricopa Sun Solar Project, Kern County, California**

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## 1.0 INTRODUCTION

Maricopa Sun, LLC (Project Administrator) is in the process of developing a solar complex (Maricopa Sun Solar Complex [Project]) in southern Kern County, California (Figure 1). The Project currently consists of seven Solar Sites that total 3,798.3 acres within southwestern Kern County, California, approximately three miles northeast of the unincorporated community of Maricopa (Figure 2, Table 1). Construction of the Project includes site preparation, grading, commercial operations, maintenance, and Project decommissioning.

**Table 1**  
**Maricopa Sun Solar Complex: Solar Sites**

HCP Site Number	APN	Township, Range	Solar Site Parcels (acres)
Site 2-S	220-120-(18-19)	T.32S., R.25E., Sec.21	628.8
Site 3-S	220-110-08	T.32S., R.25E., Sec.23	460.4
Site 4-S	295-040-(30-31)	T.32S., R.26E., Sec.19	652.5
Site 5-S	220-170-(01-02,05,07)	T.32S., R.25E., Sec.29 & 30	797.2
Site 6-S	220-130-01	T.32S., R.25E., Sec.27	304.2
Site 7-S	220-130-(02,12)	T.32S., R.25E., Sec.25&26 <sup>1</sup>	471.6
Site 15-S	295-130-25	T.32S., R.27E., Sec.33	483.6
<b>TOTAL</b>			<b>3798.3</b>

Of the threatened and endangered species and other special-status species occurring on and in the vicinity of the Project, five were selected (MSHCP Chapter 1, Section 1.2.3) for coverage under the Maricopa Sun, LLC Habitat Conservation Plan (MSHCP), based on extant populations and presence of potential habitat, and four were selected to not be covered by the MSHCP, based on the lack of habitat and very small chance that populations persist in the Permit Area. Four federally listed species, the Kern mallow (*Eremalche kernensis*), the San Joaquin woollythreads (*Monolopia congdonii*), the giant kangaroo rat (*Dipodomys ingens*) and the Buena Vista Lake shrew (BVLS) (*Sorex ornatus relictus*), occur in the vicinity of the Maricopa Sun Solar Complex. The MSHCP does not include these as Covered Species and no take coverage is being sought (Table 2). These species are not currently present on the Solar Sites, nor are they anticipated to become present on the sites during the periods of construction, operations and maintenance, or decommissioning.

## 2.0 SPECIAL STATUS SPECIES NOT COVERED

This section provides a description of the four special status species that are not covered by the MSHCP. Information on status, life history, occurrence within the project area, and potential for take for each species are represented below.

**Table 2**  
**Special Status Species Not Covered by the HCP**

Common Name	Scientific Name	Status <sup>1</sup>			Risk Level
		Federal	State	Other	
<b>Plant</b>					
Kern mallow	<i>Eremalche kernensis</i>	FE		1B.1	low
San Joaquin wooly-threads	<i>Monolopia congdonii</i>	FE			low
<b>Mammals</b>					
Giant kangaroo rat	<i>Dipodomys ingens</i>	FE	ST	-	low
Buena Vista Lake shrew	<i>Sorex ornatus relictus</i>	FE	CSSC	-	low

The following acronyms are defined as: 1B.1/.2 = California Native Plant Society listed species, CSSC = California Species of Concern, FE = Federally Endangered, ST = State Threatened.

## 2.1 Kern Mallow (*Eremalche kernensis*)

### STATUS

The Kern mallow was federally listed as endangered in 1990 and is listed by the California Native Plant Society (CNPS) as a 1B.1 species, indicating the species is rare throughout its range and is seriously threatened in California (over 80 percent of occurrences threatened or with a high degree and immediacy of threat). Among the concerns for the species' survival are the effects of habitat fragmentation from roadways and transmission line right-of-ways (ESRP 2005). All CNPS 1B list plants also meet the California Fish and Game Code (FGC) Section 2062 and 2067 definitions of threatened or endangered by the California Endangered Species Act (CESA).

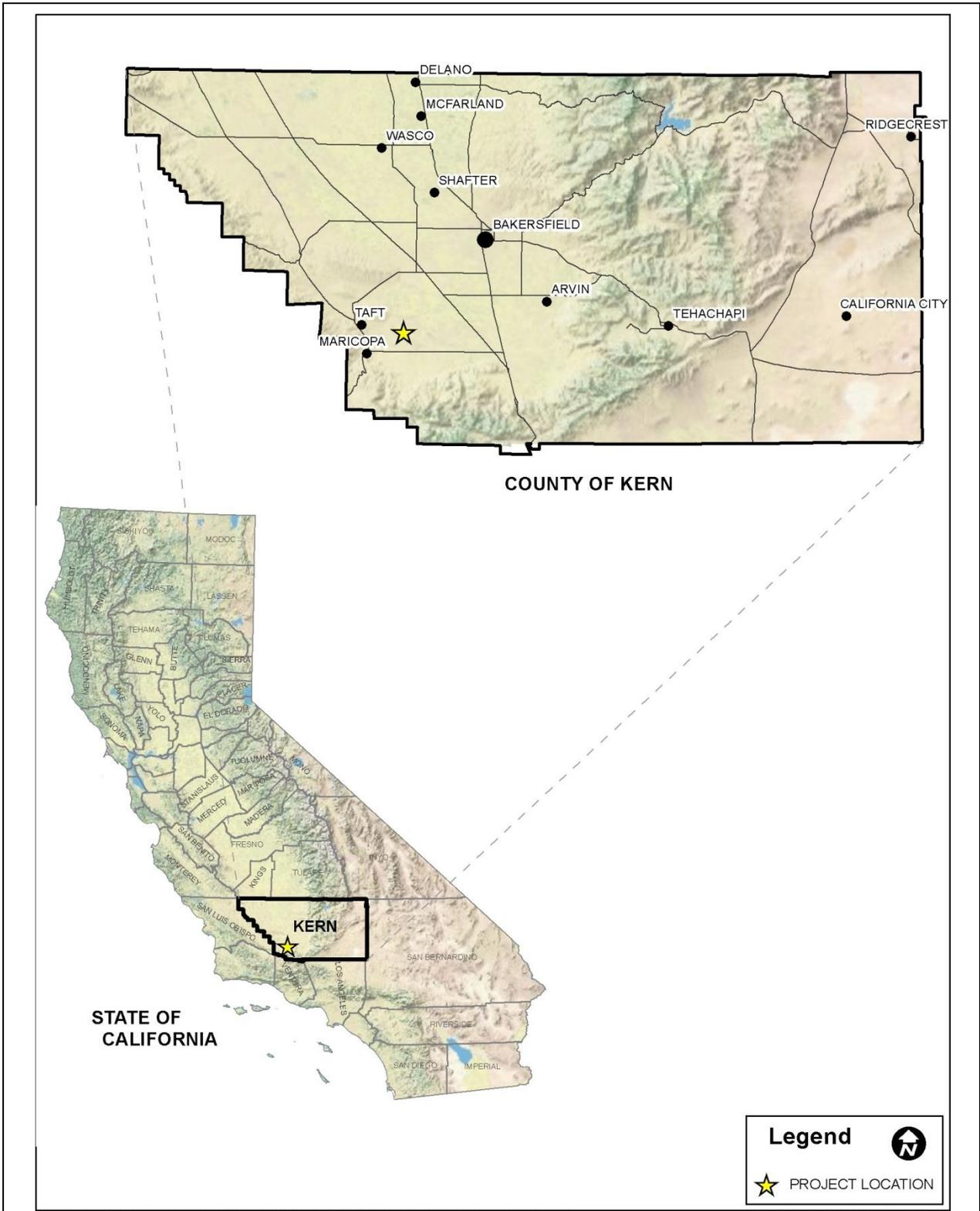
Recovery actions that are covered in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) include detailed habitat management studies.

### LIFE HISTORY

The Kern mallow has a restricted distribution, occurring only in Kern County north of McKittrick within the Lokern area. It is known from sites in the Temblor Valley, Belridge Oil Fields, and two sites west of Buttonwillow. Recently, Kern mallow has been found more extensively throughout an approximately 40-square mile area within the Lokern area, between Buttonwillow and McKittrick.

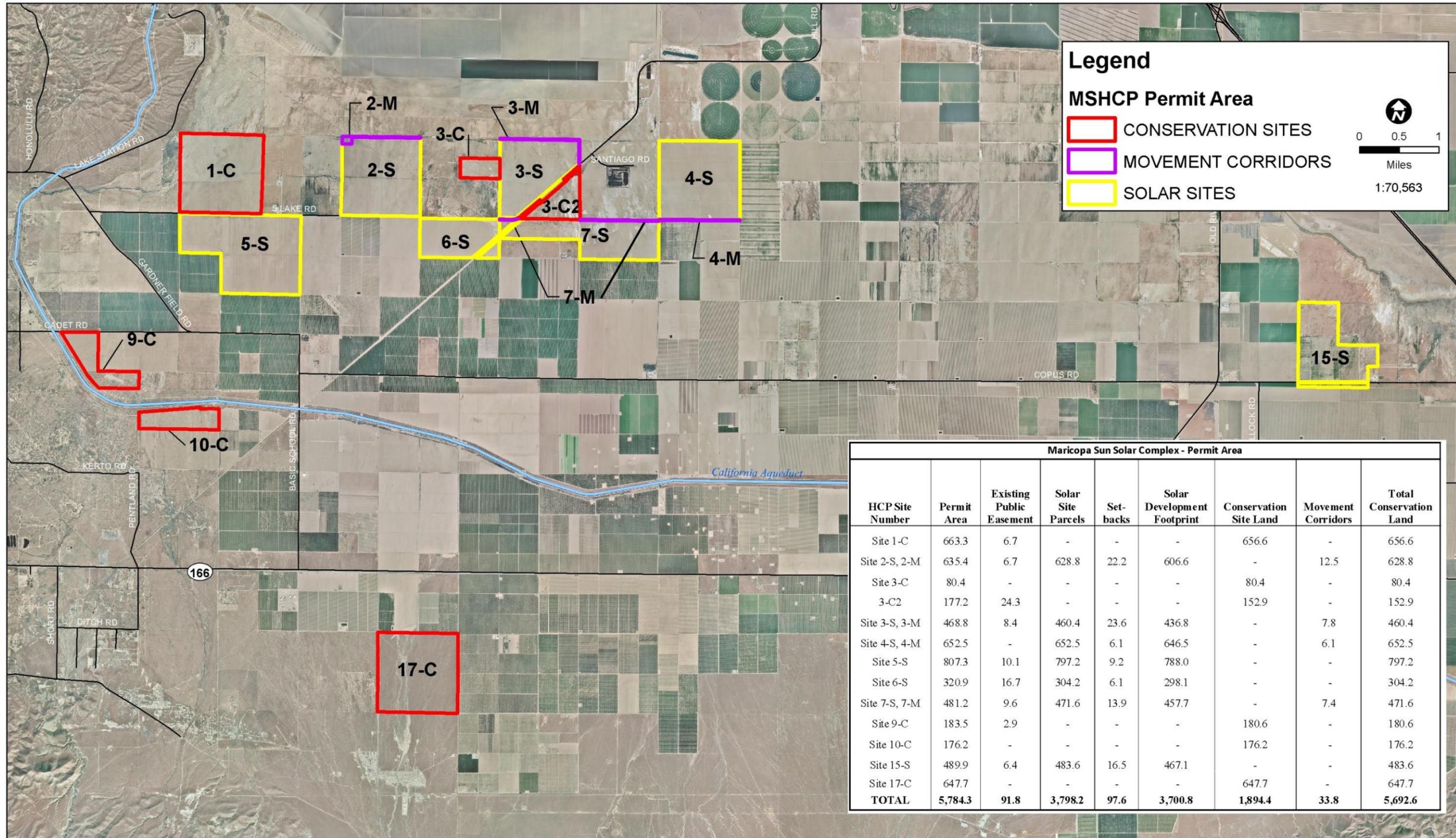
The Kern mallow is an arid adapted, annual plant. It occurs in Valley Saltbush Scrub natural communities along with saltbush (*Atriplex* spp.), red brome (*Bromus madritensis rubens*), red-stemmed filaree (*Erodium cicutarium*), woolly goldfields (*Lasthenia minor*), and white Sierran layia (*Layia pentachaeta albida*).

Germination typically occurs in January and February, with flowering beginning in March. Fruit production ensues shortly after, and may continue until May with sufficient moisture. It is unknown how long seeds may remain viable in the soil once they mature and fall to the ground.



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

**Figure  
1**



**Maricopa Sun Solar Complex - Permit Area**

HCP 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
<b>TOTAL</b>	<b>5,784.3</b>	<b>91.8</b>	<b>3,798.2</b>	<b>97.6</b>	<b>3,700.8</b>	<b>1,894.4</b>	<b>33.8</b>	<b>5,692.6</b>

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**SITE PLAN**  
**MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA**

Figure  
2

## OCCURRENCE WITHIN THE PROJECT AREA

The Kern mallow has been reported from sites near the project area; however, it is possible the reports are actually for Parry's mallow (*Eremalche parryi*) given the taxonomic uncertainty between the two species (Andreasen 2012). The Kern mallow has not been detected and has a very low likelihood of being or becoming present within the Permit Area.

## POTENTIAL FOR TAKE

Kern mallow does not currently occur within the Permit Area. The likelihood of Kern mallow becoming present within the Permit Area is very small.

## 2.2 San Joaquin Woollythreads (*Monolopia congdonii*)

### STATUS

The San Joaquin woollythreads was federally listed as endangered in 1990 and state listed by the California Native Plant Society as a 1B.2 species, indicating the plant is rare throughout its range and fairly, but not seriously, threatened in California (20-80 percent of occurrences threatened or with a moderate degree and immediacy of threat). All CNPS 1B list plants also meet the FGC Section 2062 and 2067 definition of threatened or endangered by the CESA. Among the largest threats to the San Joaquin woollythreads are conversion of land to agriculture and urban development.

Recovery actions that are covered in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) include detailed habitat management studies.

### LIFE HISTORY

The San Joaquin woollythreads is a dicot, annual herb native to California. The species occurs within the San Joaquin Valley floristic zone in the counties of Fresno, Kings, Kern, San Benito, Santa Barbara, and San Louis Obispo; and is now extirpated from Tulare County. Currently only 19 populations of San Joaquin woollythreads are currently known (USFWS 2010). Of the previously 91 reported California Natural Diversity Database (CNDDB) occurrences, 25 are now described as "possibly extirpated," and all but two of those are confirmed to be extirpated by the U.S. Fish and Wildlife Service (USFWS 2010).

The San Joaquin woollythreads occupies annual grassland and saltbush scrub habitats of the San Joaquin Valley floor. These habitats are characterized by hot, dry summers and mild, moist winters. Seasonal maximum rainfall occurs in December through February and this yields maximum annual growth from February through May. Plant associations within the geographic area consist of several annual grass species, such as wild oats (*Avena fatua*), brome (*Bromus* sp.), barley (*Hordeum* sp.), fescue (*Festuca* sp.), common saltbush (*Atriplex polycarpa*), and spiny saltbush (*Atriplex spinifera*).

The name of this species derives from the long trailing stems that are covered with hairs, which often grow in a twining fashion reminiscent of a tangled ball of thread. As an annual forb, the San Joaquin woollythreads only flowers once a year, between late February and early April. Under the correct conditions it has been known to bloom in May.

## **OCCURRENCE WITHIN THE PROJECT AREA**

The San Joaquin woollythreads has not been detected and has a very low likelihood of being present within the Permit Area. On the basis of CDFW reports, it is highly unlikely the San Joaquin woollythreads will ever occur in the vicinity of the Project.

## **POTENTIAL FOR TAKE**

The San Joaquin woollythreads has not been detected on or in the vicinity of the Permit Area, and is very unlikely to ever occur on or in the vicinity of the Permit Area. The potential for take of the San Joaquin woollythreads due any Covered Activity or any other Project activity is exceedingly low.

## **2.3 Giant Kangaroo Rat (*Dipodomys ingens*)**

### **STATUS**

The giant kangaroo rat was federally listed as endangered in 1980, and was California State listed as endangered in 1987.

Recovery actions that are covered in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) include detailed habitat management studies.

### **LIFE HISTORY**

Giant kangaroo rats are inhabitants of the most arid, southwestern edge of central California's San Joaquin Valley, and adjacent valleys and plateaus of the Inner Coastal ranges. Populations of this species are currently fragmented into six major geographic units: the Panoche Region in western Fresno and Eastern San Benito Counties, Kettleman Hills in Kings County, San Juan Creek Valley in San Luis Obispo County; western Kern County in the area of Lokern, Elk Hills and other uplands around McKittrick, Taft, and Maricopa; Carrizo Plain Natural Area in eastern San Luis Obispo County; and Cuyama Valley in Santa Barbara and San Luis Obispo Counties. They are found from elevations of about 270 to 2,600 feet, though currently most extant populations are at elevations above 600 feet with few populations located above 2,300 feet (USFWS1998).

Giant kangaroo rats mainly inhabit sandy-loam soils located on level and gently sloping ground vegetated with annual grasses and forbs and widely-scattered desert shrubs. Extant habitat has been fragmented, mostly by irrigated croplands and petroleum developments. Below about 1,300 feet at Panoche Creek in western Fresno County and in Lokern, Buena Vista Valley, and Elk Hills regions of the southern San Joaquin Valley, giant kangaroo rats are found in grassland and

open scrub habitats. Scattered common and spiny saltbushes or ephedra shrubs characterize habitat with which giant kangaroo rats are associated. The most common herbaceous plants characterizing giant kangaroo rat habitat are red brome, annual fescue, and red-stemmed filaree (Williams 1992).

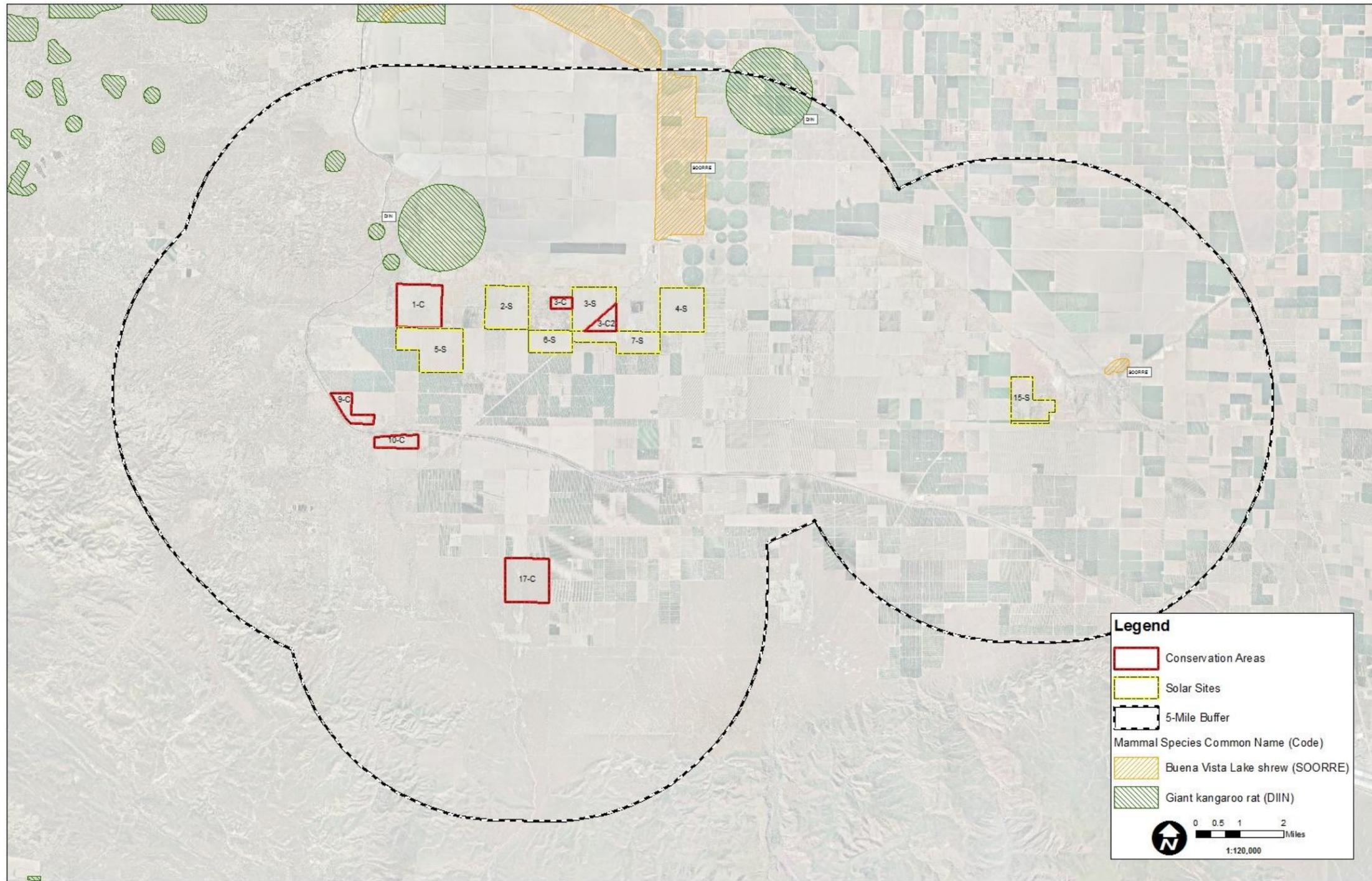
Giant kangaroo rats are primarily seed eaters (granivorous), but will also consume insects and green plants, such as the leaves of clover (*Trifolium depauperatum*) and filaree. Giant kangaroo rats drink little if any water due to their kidney physiology, high production of metabolic water (water produced during cellular metabolism), and the high water content in the seeds they eat.

Giant kangaroo rats can breed the year of their birth when environmental and social conditions are favorable. Most females enter estrus (a state of being reproductively receptive) during the cool, wet winter in central California, usually from mid to late December through January. When population density is high and most precincts (burrow systems) are occupied, adult females may have only a single litter of one to four young after a gestation period of about 32 days. Under these circumstances, young-of-the-year tend not to breed. During years of drought and low or no seed production, females are monestrous (single estrus cycle) or anestrous (no estrus cycle). During years with a prolonged wet season or where population density is low and there are many vacant precincts, adult females may have two to three litters, and young-of-the-year females may begin breeding when about 12 to 13 weeks old. Young giant kangaroo rats appear on the surface when they weigh about 50 to 70 grams and are presumably about 6.5 to 8.5 weeks old (USFWS 1998).

Giant kangaroo rats are active all year and in all types of weather. They do not migrate, nor do they become dormant or torpid. This species is known for bipedal locomotion in the form of two-footed hopping. They forage on the surface from around sunset to near sunrise, though most activity takes place in the first 2 hours after dark. Giant kangaroo rats cut the ripening heads of grasses and forbs and cure them in small surface pits located on the area over their burrow system. After placing seeds and seed heads in pits, the animal covers them with a layer of loose, dry dirt (USFWS 1998). One diagnostic sign of kangaroo rat presence are “haystacks,” the cut and piled stems and seed heads of grasses.

## **OCCURRENCE WITHIN THE PROJECT AREA**

No giant kangaroo rats or their diagnostic signs were observed on or near any of the project sites (Quad Knopf, 2010a, 2012b). No suitable habitat for this species is present on or in the immediate vicinity of the project sites. The closest historic CNDDDB record, dated 1989, reports giant kangaroo rat approximately 0.6 miles northwest of Site 2-S (Figure 3). Two 1978 CNDDDB records report the species approximately 1.3 miles north of Site 5-S, and approximately 2 miles northwest of Site 5-S (Figure 3). Another 1978 record reports the species approximately 3.3 miles northwest of Site 5-S, which places it on the slopes of San Emigdio Mountain, not on the valley floor where the project site is (Figure 3). A 1979 record reports giant kangaroo rat approximately 3.7 miles northeast of Site 4-S (Figure 3).



The historic records of giant kangaroo rat approximately 2 miles northwest of Site S-2, and 3.7 miles northeast of Site 4-S are not likely extant. Those areas are on the valley floor, where widespread and intensive agricultural activities dominate the landscape. No remnants of native habitat that would be capable of supporting viable populations of this species exist within these areas. The three subpopulations that were recorded in the San Emigdio Hills northwest of the project sites are likely extant.

## POTENTIAL FOR TAKE

It is unlikely that giant kangaroo rats would become established on or in the vicinity of the project sites during the life of the project. Known populations of this species occur northwest of the project sites, but these populations are located west of the California Aqueduct, which acts as partial barrier to the species' movements. Furthermore, the land use between the project sites and the California Aqueduct near the locations of these populations is intensively managed agricultural fields and is not compatible with this species. It is unlikely that this species would become present on lands within or adjacent to the project sites. Neither construction activities, operations and maintenance activities, decommissioning activities, nor conservation activities would result in the take of this species.

### 2.4 Buena Vista Lake Shrew (*Sorex ornatus relictus*)

#### STATUS

The BVLS is federally listed as endangered and is a California State Species of Special Concern.

Conservation actions presented in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) include establishment of the Kern Lake Preserve, protection of habitat for the BVLS, and establishment of habitat that can support expansion and introduction efforts. Efforts to locate and protect other populations of the BVLS within Tulare Basin are needed.

#### LIFE HISTORY

The historical range of the BVLS was within the southern San Joaquin Valley in lakes, wetlands, and sloughs. The loss of habitat through drainage of wetlands and lakes, channelization of streams, and diversion of water to accommodate agricultural production has caused the decline of the BVLS. Currently, BVLS is known in four locations: the Kern Preserve, Kern Fan recharge area, Cole Levee Ecological Preserve, and the Kern National Wildlife Refuge. The species has also recently been captured in the Goose Lake area near Wasco, and on the Wind Wolves Preserve. The status of the populations in these two areas is uncertain.

Buena Vista Lake shrew has been found associated with mesophytic (moist vegetative) communities with an abundant layer of litter. Habitat associated with the more recently discovered shrews include Fremont cottonwood (*Populus fremontii*), willows (*Salix* sp.), alkali heath (*Frankenia grandiflora*), wild rye grass (*Leymus triticoides*), and Baltic rush (*Juncus balticus*) (USFWS 1998).

Shrews often eat more than their own weight in a single day to meet the needs of their high metabolic rate. Their primary diet consists of insects and other small invertebrates (Harris 1990; Maldonado 1992). During the hot months they often restrict their foraging to night-time hours. They do not store food, but must eat frequently because of their high metabolic rate. They are a secondary burrower, mostly using previously excavated burrows of other animals.

Little is known about the reproductive behavior of BVLS. Shrews generally breed only once a year during early spring and give birth after a 21 day gestation period; however, breeding from late February through early October has been documented (Rudd 1955; Brown 1974; Rust 1978). Litters usually consist of 4 to 6 young. The life expectancy of a shrew is 12 to 16 months (Rudd 1955). A short life span and limited reproductive capabilities may be a limiting factor to BVLS survival in the face of habitat loss.

### **OCCURRENCE WITHIN THE PROJECT AREA**

No BVLS were captured or otherwise detected on the Project sites during trapping efforts conducted in habitat that could potentially harbor the species (Quad Knopf 2010a). There are several ponding basins and canals within and adjacent to Sites 3-S, 4-S, and 15-S that appeared to have habitat suitable for BVLS (Quad Knopf 2010a), but the locations of these potential habitat patches are outside of the Solar Development Footprint of the solar development.

Three historic records report BVLS within a five-mile radius of the Project site (Figure 3). The closest historic record, dated 1932, is located approximately 1.1 miles north of Site 4-S (Figure 3). A record from 1999 is located approximately 4.9 miles north-northeast of Site 4-S, within the historic basin of Buena Vista Lake (Figure 3), now known as the “Buena Vista Aquatic Recreation Area.” A BVLS observation was recorded in 1991 approximately 1.3 miles northeast of Site 15 (Figure 3). Some areas of the project sites are within five miles of USFWS-designated Critical Habitat for this shrew, but the distribution of Critical Habitat is undergoing review by the USFWS and several options have been proposed.

### **POTENTIAL FOR TAKE**

There are some wetland areas on and near the project sites that could potentially harbor the BVLS, but these areas are not within the footprint of the solar development. No shrews were captured from the wetland areas and no evidence was found that supports a determination that these areas contain habitat that would support the shrew. The wetland areas are dry during substantial portions of the year, isolated from other wetland habitats, and the potential for the occurrence of shrews in these wetland areas is low. The wetland areas will not be impacted by the project and take of this species is not likely to occur.

## **3.0 CONCLUSION**

The giant kangaroo rat and BVLS are not currently present on the Project sites, nor are they anticipated to become present on the sites during the periods of construction, operations and maintenance, or decommissioning. It is not likely that these species will be adversely affected by the proposed Project. Take permits are not warranted.

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