

Appendix D-15

Desert Tortoise Survey 2009

Presence/Absence Survey for the Desert Tortoise (*Gopherus agassizii*) on the proposed Sun Creek Project, Kern County, California

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EXECUTIVE SUMMARY

As recommended in the US Fish and Wildlife Service (USFWS) *Survey Protocol for any Non-Federal Action that may Occur within the Range of the Desert Tortoise* (January 1992), a desert tortoise (*Gopherus agassizii*) presence or absence survey was conducted on the proposed 2,182 acre Sun Creek Project site located approximately 2.5 miles northwest of the town of Mojave in Kern County, California. All 2,182 acres within the project area were delineated as potential desert tortoise habitat. The delineated area was surveyed for desert tortoises and tortoise sign from 20 - 27 May 2009. Access to adjacent lands was not obtained. As such, no zone-of-influence transects were conducted. The survey area ranges in elevation from 3,141 to 4,053 ft and is characterized by multiple vegetation communities including Mojave creosotebush desert scrub, Joshua tree woodland, juniper woodland, mixed upland desert scrub, and desert riparian along Cache Creek. Four adult tortoises and one juvenile were found on the site, as well as 28 burrows, 1 shell-skeletal remains, and 40 scat events.

Most common human impacts within the survey area were paved highways, railroad tracks, dirt roads, Off Highway Vehicle (OHV) trails and campsites, and degradation due to sheep grazing. The overall habitat condition is good, although many areas are severely degraded, mainly due to heavy OHV use of the area.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ii -
INTRODUCTION	4 -
METHODOLOGY	4 -
HABITAT DELINEATION	4
SURVEY METHODOLOGY	4
DATA RECORDED	5
BIOLOGICAL FIELD TEAM	5
RESULTS	5 -
SURVEY AREA	5
Section 34	6 -
Section 35	6 -
Section 27	6 -
Section 26	7 -
Section 28/Portion of Section 33	7 -
SURVEY RESULTS	7
DISCUSSION	8 -
MITIGATION RECOMMENDATIONS	8 -
LITERATURE CITED	10 -
TABLE 1. DESERT TORTOISE AND SIGN LOCATIONS	12 -
TABLE 2. OTHER SENSITIVE SPECIES AND SIGN LOCATIONS	14 -
TABLE 3. PLANT SPECIES	15 -
TABLE 4. MAMMAL SPECIES	20 -
TABLE 5. REPTILE SPECIES	20 -
TABLE 6. BIRD SPECIES	21 -
FIGURES	22 -

INTRODUCTION

This report addresses the results of a presence/absence survey for the state and federal threatened desert tortoise on the proposed Sun Creek Wind Farm Project in Kern County, California. Potential desert tortoise habitat was delineated based on vegetation, elevation, and topography.

The proposed project is located approximately 2.5 miles northwest of the City of Mojave, California and comprises approximately 3.5 square miles. The site is located along the Highway 58 corridor in the foothills of the Tehachapi Mountains and in the adjacent Mojave Desert (Figure 1). The site includes Sections 28 and 34, and portions of Sections 26, 27, 33, and 35 in Township 32S, Range 35E, and part of Section 31 in Township 12N, Range 12W (U.S. Geological Survey (USGS) Mojave 7.5-minute series topographic quadrangle). The elevation of the proposed project site ranges from 3,141 to 4,053 feet above mean sea level (Figure 2).

A total of 2,182 acres were surveyed for desert tortoises and tortoise sign between 20 May 2009 and 27 May 2009.

METHODOLOGY

HABITAT DELINEATION

Delineation of the potential desert tortoise habitat was done prior to commencing the survey. Vegetation, elevation, and topography were considered for the delineation. All typical vegetation communities used by desert tortoises throughout their geographic range were included in the survey area (Figure 2). Additionally, the ecotone communities between suitable habitat and unsuitable habitat were included (i.e. juniper tree – Joshua tree woodland ecotone).

SURVEY METHODOLOGY

The following methodology was used to increase efficiency in determining presence or absence of desert tortoises through systematic search and location of tortoises, their burrows and other sign. This methodology has proven accurate on other large-scale presence/absence surveys for desert tortoise.

A team consisting of twenty experienced desert tortoise biologists conducted the survey by walking a set of transects that covered the 2,182 acre survey area. Transect spacing was at 30 feet between transect centerlines, the standard specified width for desert tortoise presence/absence surveys (USFWS 1992). No more than five biologists surveyed together in a team, as larger team sizes decrease efficiency and accuracy.

A set of UTM coordinates for transect endpoints for virtual north-south and virtual east-west transects were calculated. This resulted in over 600 miles of transects varying in length from 50 feet to 1 mile. For navigation of transects Lowrance iFinder handheld global positioning system (GPS) units were used.

Each team was equipped with an iFinder GPS. One member of each team was responsible to navigate the selected transect. When the end of a transect was reached, the team shifted five transects (for a five person team) and the navigator programmed the beginning and ending point of the team center transect for the next sweep.

Team members focused on a search area that extended 15 feet on either side of them. The members of each team remained close to one another without leading or lagging in order to increase the precision of searching. When one member of the team stopped to investigate an observation, all members of the team stopped. Team members were instructed to search beneath every shrub.

In very steep areas of Sections 28 virtual east-west or virtual north-south transects were not used. Due to the rugged terrain, this approach would not be efficient. Instead transects were designed to follow the terrain paralleling the canyons and ridgelines, and very steep sections were eliminated due to worker safety and unsuitable tortoise habitat.

DATA RECORDED

Any tortoise or large mammal burrows encountered that could potentially be used by tortoises were visually checked and probed when the end was not visible. Very small burrows that could be potentially utilized by juvenile tortoises but are much more often rodent burrows were also visually checked when encountered. Only definitive tortoise sign was recorded. The locations of all desert tortoise finds are depicted in Figure 3.

BIOLOGICAL FIELD TEAM

The field survey was managed by Mercy Vaughn. The biological team for the survey was as follows:

James Borgmeyer	Bruce Weise	Brooks Hart
Dave Prival	Ashley Spenceley	Martin Figueroa
Lori Rose	Debbie Vaughn	T.G. Jackson
Myles Traphagen	Phil Rosen	Colin Spake
Betsy Wirt	Kiea Wright	Josh Holloway
Brendon Nosratbakhsh	Susan Moore	Mercy Vaughn
Erin Zylstra	Wayne Ball	

RESULTS

SURVEY AREA

The survey area ranges in elevation from 3,141 to 4,053 ft and is characterized by multiple vegetation communities including Mojave creosotebush desert scrub, Joshua tree woodland, juniper woodland, mixed upland desert scrub, and desert riparian along Cache Creek. Habitats are described per USGS quadrangle map section below. The geomorphology of the survey area includes upper bajada to steep foothills with predominantly silty sand soils; areas of gravel and cobble; and deeply incised washes (see Photos, Figure 4). The most common human impacts observed within the survey area were paved highways, railroad tracks, dirt roads, Off Highway Vehicle (OHV) trails and campsites, and degradation due to sheep grazing. The overall habitat condition is good, although many areas are severely degraded, mainly due to heavy OHV use of the area.

SECTION 34

Section 34 lies in the Horned Toad Hills 0.5 mile south of Highway 58, and 0.5 mile west of the Los Angeles Aqueduct road. Relatively flat, undulating bajada in the east, gradually climbs west into the Tehachapi foothills where it becomes very steep, with sharply undulating terrain, especially in the northwest corner. There are a number of small to medium sized washes draining the site to the east-southeast on the north and south sides of Section 34. The soil ranges from fine sand to sandy loam, with areas of large pebbles and cobbles in washes at higher elevations. This section contains a high plant diversity, including *Larrea tridentata* (creosotebush), *Yucca brevifolia* (Joshua tree), *Krascheninnikovia lanata* (winterfat), *Ambrosia dumosa* (burrobush), *Hymenoclea salsola* (cheesebush), *Acamptopappus sphaerocephalus* (goldenhead), *Ericameria cooperi* (Cooper's goldenbush), *Tetradymia stenolepis* (Mojave horsebrush), *Eriogonum fasciculatum* (California buckwheat), *Ephedra nevadensis* (Nevada joint-fir), *Chrysothamnus nauseosus* (rubber rabbitbrush) and *Grayia spinosa* (spiny hop-sage). Recreational OHV use has caused significant damage. There are extensive trail and road networks throughout the area with numerous large, completely denuded campsites. This extensive OHV use was observed on surrounding hills and valleys both on and adjacent to the site. Because of regular and repeated use, these areas suffer from soil compaction and considerable erosion, affecting runoff and revegetation potential. Evidence of sheep grazing in this section is minimal. Despite the extensive OHV damage to the area, this section is highly suitable tortoise habitat. The steep hills and deeply incised washes provide some security from OHV activity as well as thermal buffering and potential forage during years of low precipitation.

SECTION 35

Section 35 lies in the Horned Toad Hills 0.5 mile south of Highway 58. The Atchison Topeka and Santa Fe Southern Pacific railroad forms the eastern edge of Section 35 and it is diagonally bisected by the Los Angeles Aqueduct road. The topography is a relatively flat bajada sloping gently to the southeast. The soil ranges from fine sand to sandy loam. The western half of this section contains a high diversity of plants similar to the species identified in Section 34. The shrub diversity in the eastern half diminishes to creosotebush, burrobush, Cooper's goldenbush, and *Eriogonum fasciculatum* (California buckwheat). Recreational ATV's and off-road use have caused significant damage. There are extensive trail and road networks throughout the area with numerous large, completely denuded campsites. This is also the case on portions of hills and surrounding valleys. As in Section 34, these areas suffer from soil compaction and considerable erosion. Evidence of sheep grazing in this section is minimal. Despite the extensive OHV damage to the area, this section is highly suitable tortoise habitat.

SECTION 27

Section 27 lies along the southern edge of Atchison Topeka and Santa Fe Southern Pacific railroad, about 0.5 mile south of Highway 58. Topography ranges from gently undulating bajada in the east end to steep north-facing foothills at the west end. Soils range from sand and gravel to compacted clay. Drainages and washes were typically sandy. Steep slopes often had poor soil development and were covered with coarse granitic gravel and outcroppings of solid granite. Plateau areas to the east tended to have higher clay content and consisted primarily of sandy loam. The primary habitat type in this area was creosotebush scrub with some areas of Joshua tree dominance. Lower elevation areas were dominated by creosotebush, Cooper's goldenbush and *Bromus tectorum* (cheat grass). Steep north-facing slopes in the western portion of section 27 contained *Juniperus californica* (California juniper) and *Purshia tridentata* var. *glandulosa* (Mojave antelope bush). Rubber rabbitbrush was present in high concentrations within lower sandy areas and alongside disturbed OHV trails and roads. Off-road travel and OHV use was evident, and the survey area was traversed by single-track trails and well defined dirt roads. Shotgun

shells provided evidence of hunting and target practice targets were strewn about in the east end of the section. Old dump sites were intermittent. Evidence of sheep grazing was minimal. Despite the moderate OHV damage in the area, this section contains suitable tortoise habitat.

SECTION 26

Section 26 is bisected by the Business Highway 58 turn off; the Los Angeles Aqueduct road bisects the eastern side of the section. The topography is characterized by a relatively flat bajada sloping gently to the southeast. The soil ranges from fine sand to sandy loam. Dominant plants include creosotebush,, Joshua tree, winterfat, burrobush, cheesebush, goldenhead, *Encelia actonii* (Acton's encelia), Cooper's goldenbush, Mojave horsebrush, California buckwheat, Nevada joint-fir, rubber rabbitbrush, and spiny hop-sage). Near Highway 58 (within about 200 meters), the area is dominated by *Baccharis* sp., and *Ericameria linearifolia* (interior goldenbush). Cooper's goldenbush, Acton's encelia, cheesebush, and *Yucca whipplei* (our lord's candle) are also present. Evidence of sheep grazing is minimal. Despite the moderate OHV damage in the area, this section contains suitable tortoise habitat.

SECTION 28/PORION OF SECTION 33

These sections are located 1.5 miles west of the Los Angeles Aqueduct road. Highway 58 bisects Section 28 running northeast to southwest. The topography of the area is highly variable, with steep foothills in the north turning into upper bajada before being bisected by Highway 58, the railroad, and its associated maintenance road. South of the railroad access road lies the large incised wash of Cache Creek, which drains to the east, following the base of a very steep, long grade. This area of the Tehachapi foothills climbs sharply to the south, and ends at a rolling plateau that drops away to the south-southeast. Most of this steep area was not searched due to the extreme gradient, the safety risks associated with it, and the lack of suitable habitat for tortoises. The shrub density quickly diminished, and it became so steep that rock slides were evident. There was no suitable location or substrate for burrow construction in this terrain. Soils ranged from a sandy loam to coarse gravel to cobbles and boulders in Cache Creek and in the northern section. The vegetation community in the northern half of the section included *Salazaria mexicana* (paper-bag bush), California juniper, Joshua tree, burrobush, Nevada joint-fir, California buckwheat, *Atriplex polycarpa* (Allscale), *Amsinckia* spp. (fiddleneck), and spiny hop-sage. The flats below the steep slope in Section 28, south of Highway 58, which included the area between the slope and the highway right-of-way fence were surveyed. In the flats, rubber rabbitbrush was dominant along the railroad tracks. *Baccharis* sp. was dominant in and along the wash. There was also some *Tamarix ramosissima* (Tamarisk) in the wash. Allscale was dominant along the road parallel to the railroad tracks. The vegetation community on the steep slope and the ridge in the southern half of section 28 is characteristic of a mixed upland desert scrub dominated by Joshua tree, California buckwheat, interior goldenbush, *Xylorhiza tortifolia* var. *tortifolia* (Mojave aster), our lord's candle, Acton's encelia, *Achnatherum speciosum* (desert needle grass), Cooper's goldenbush, *Lycium andersonii* (Anderson thornbush), *Lepidium fremontii* (desert alyssum), goldenhead and *Penstemon incertus* (Western desert penstemon). There are moderate dirt road and OHV trail networks throughout the southern area, railroad tracks, dirt roads, and Highway 58 near the center of the section. Evidence of sheep grazing is minimal. Despite the moderate OHV damage in the area, this section contains suitable tortoise habitat.

SURVEY RESULTS

Desert tortoise is listed as a threatened species by both state and federal governments (California Department of Fish and Game, 2006b). High density annual vegetation cover made finding scat, carcass

parts or other tortoise sign more difficult than in drier years and necessitated careful searching. Four adult tortoises and one juvenile were found on the site, as well as 28 burrows, one shell-skeletal remains, and 40 scats.

DISCUSSION

The survey area as delineated in Figure 2 lies at the far western edge of the geographic range for the desert tortoise. Four adult tortoises and one juvenile tortoise were found along with a moderate amount of other tortoise sign. The presence of a juvenile tortoise indicates reproduction is occurring, however, it is unknown if recruitment is occurring, as no immature tortoises were observed during the survey. It is probable that the proposed project site is supporting a low to moderate density population, which may or may not be viable. A major factor affecting the potential viability of the tortoise population on site is the high OHV activity impacting this area. Soil compaction, loss of shrub cover and forage areas appear to have all resulted from intensive OHV use. In addition, Highway 58 and Highway 14 are not fenced with tortoise proof fencing where they traverse or approach the site. Road mortality on these highways may also be affecting the status of this population. If the widespread, severe human impacts on the site continue, it is probable that desert tortoises in this region will be extirpated. Exclusion of OHV activity would eliminate what appears to be the dominant land use impacting the tortoise on the Sun Creek site.

MITIGATION RECOMMENDATIONS

While it is typical to seek off-site mitigation lands for projects impacting desert tortoise habitat, it is recommended that the Agencies strongly consider on-site mitigation for the Sun Creek Project. Desert tortoises remaining west of SR 14 and south of SR 58 are essentially isolated by both highways as well as railroad tracks, but contiguous suitable habitat occurs to the south to Rosamond Boulevard, which is a sizeable area. The quality of the habitat on site south of Highway 58 is severely degraded by heavy OHV activity, but a few tortoises are still managing to survive and reproduce. With this in mind, the site may be an ideal area to consider headstarting with juvenile tortoises in an attempt to recover these extreme western populations. The area of the project north of Highway 58 and west of Highway 14 was moderately impacted, and the density of desert tortoise sign noted was considerably lower than that documented south of Highway 58.

The limited surface impacts of constructing wind generation facilities may allow for the coexistence of desert tortoises and wind turbines. However these impacts combined with the current land uses (heavy OHV use and moderate sheep grazing) will most certainly and significantly reduce any chance for these very low-density populations to recover, unless a properly developed mitigation plan is executed.

The concept of mitigation lands being purchased off site and conserved in perpetuity is appropriate when dealing with significant reduction in high quality habitat inhabited by stable populations. It is important to note that the ownership of mitigation lands does not guarantee that conservation efforts are being undertaken nor that recovery of the species is occurring. The Sun Creek site and other similar sites are unique in their needs for conservation. Within the far western edge of the species' geographic range, isolated by anthropogenic features, and with very low population densities, the greatest opportunity for recovery these tortoise populations may have is to minimize the threats they currently face while still allowing the proposed project to move forward.

Though desert tortoise densities are low the proposed project may result in both direct and indirect impact to the desert tortoises in the area. In order to minimize indirect impacts through loss of habitat the following measures are recommended.

Mitigation Recommendations for Habitat Enhancement:

- a. Terminate existing grazing leases.
- b. Fence an agreed upon acreage of suitable desert tortoise habitat to keep out OHV and sheep activity for the life of the project that will allow tortoises to move freely and maintain genetic exchange. With such a measure the wind farm may, in fact, be beneficial for the conservation of the tortoise as well as other desert wildlife species.
- c. Revegetate denuded areas and areas temporarily used during construction to improve habitat for desert tortoises.
- d. Use existing roads whenever practicable in order to minimize new surface disturbance.

In order to mitigate potential direct impacts, the following measures will help minimize the potential for “take” of tortoises during and after construction.

Develop a biological monitoring plan in consultation with the USFWS and the CDFG. This plan would describe all measures to be implemented prior to, during and post-construction, which would include, but not be limited to, the following measures:

- a. All land survey crews on site prior to construction will be escorted by a qualified desert tortoise biologist (approved by USFWS and CDFG). Land survey crews frequently travel cross-country in vehicles prior to construction and a qualified tortoise monitor will clear the path immediately in front of the survey crew.
- b. All vehicular traffic with limited visibility related to the project during construction, be it on existing roads or cross country will be escorted by a qualified biologist unless temporary tortoise proof fencing is erected in these areas.
- c. Site access will be limited to designated access roads so as to avoid “take” on unmonitored roads.
- d. Project speed limit will not exceed 15 MPH during construction and operations.
- e. Temporary tortoise-proof fencing (1”x 2” mesh hardware cloth) may need to be erected and maintained between the interface of the project construction areas and any remaining desert tortoise habitat prior to initiating construction and clearance surveys for desert tortoises on site. The fence will prevent tortoises from wandering onto the wind turbine sites. Fencing would be maintained with oversight by an authorized biologist. Fence installation would be monitored by a qualified tortoise biologist.
- f. Tortoise clearance surveys will be conducted at 15-foot intervals. It is recommended that two desert tortoise clearance surveys without finding any tortoises or new tortoise sign be conducted

prior to declaring the fenced construction sites free of tortoises. All burrows that could provide shelter for a desert tortoise will be excavated during the first clearance survey. If a tortoise is encountered while conducting a clearance survey or during burrow excavation the tortoise will not be handled but will be monitored from a distance to ensure its safety. The temporary tortoise-proof fencing will be removed, and no further construction will occur in the area until the tortoise has moved on its own out of the area.

- g. All construction personnel will undergo desert tortoise awareness training.
- h. After the tortoise proof-fence is erected a qualified biologist(s) will remain onsite until all vegetation is cleared and, at a minimum, conduct site and fence inspections on a bi-weekly basis throughout construction in order to maintain compliance with mitigation measures.
- i. A qualified biologist(s) will be onsite to survey for tortoises immediately in front of vegetation clearance activities in the event a tortoise was inadvertently missed during clearance surveys.
- j. A biologist will remain on-call throughout construction in the event a tortoise wanders onto a construction site.
- k. A raven management plan will be developed for the project site.
- l. The project proponent will maintain an environmental awareness training program for all maintenance employees.
- m. The project proponent will provide post-construction reports to USFWS and CDFG within 90 days of completion of construction documenting any tortoise or tortoise sign encounters as well as measures taken.

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TABLE 1. DESERT TORTOISE AND SIGN LOCATIONS

Sign	Easting	Northing
Live Adult in burrow	389248	3884491
Live juvenile in burrow	389217	3885818
Live Adult in burrow	389353	3885684
Live Adult under California juniper	389458	3884858
Live Adult in Burrow	389638	3885797
Tortoise tracks	389322	3885496
Tortoise tracks	389390	3885660
Tortoise tracks	389520	3885572
Tortoise tracks	389531	3885808
Tortoise tracks	389555	3884616
Tortoise tracks	389603	3885792
Burrow	389110	3885712
Burrow	389248	3884491
Burrow	389261	3885643
Burrow	389251	3885668
Burrow	389217	3885818
Burrow	389196	3885647
Burrow	389328	3885460
Burrow	389431	3885435
Burrow with scat	389434	3885467
Burrow	389467	3885801
Burrow	389549	3885698
Burrow	389787	3884312
Burrow	389812	3884416
Burrow	390240	3886225
Burrow	387808	3885982
Burrow	389054	3885324
Burrow	389055	3885656
Burrow and scat	387539	3887036

TABLE 1. DESERT TORTOISE AND SIGN LOCATIONS

Sign	Easting	Northing
Burrow and scat	388152	3887500
Burrow	388085	3887413
Burrow	390106	3884340
Burrow	390082	3884294
Burrow	388677	3886110
Burrow	388370	3886036
Shell - skeletal remains	390191	3884435
Scat	389153	3884537
Scat	389158	3885750
Scat	389140	3885771
Scat	389119	3885782
Scat	389100	3885766
Scat	389118	3885729
Scat	389325	3885660
Scat	389337	3885666
Scat	389376	3885473
Scat	389379	3885392
Scat	389445	3884752
Scat	389438	3885350
Scat	389438	3885380
Scat	389428	3885613
Scat	389438	3885626
Scat	389402	3885748
Scat	389392	3885705
Scat	389470	3885572
Scat	389575	3885685
Scat	389555	3885691
Scat	389748	3885441
Scat	389037	3885696

TABLE 1. DESERT TORTOISE AND SIGN LOCATIONS

Sign	Easting	Northing
Scat	389094	3885727
Scat	389095	3885756
Scat	387539	3887036
Scat	388152	3887500
Scat	390082	3884294
Scat	388459	3886062

UTM coordinates in CONUS NAD 83 Zone 11S

TABLE 2. OTHER SENSITIVE SPECIES AND SIGN LOCATIONS

Date	Observation	Easting	Northing	Comments
NAD 83, ZONE 11				
LOGGERHEAD SHRIKE				
May 21	adult perched	390475	3885505	Calling in creosote
May 22	adult perched	390227	3884120	In Joshua tree
May 22	adult	389119	3885819	
May 22	adult	387549	3886709	Calling
May 23	adult perched	390976	3884924	In Joshua tree
May 23	adult	389673	3885651	
May 23	adult	389604	3885474	
May 24	adult flying	391600	3885020	
May 24	nest	388007	3886795	3 nestlings
May 24	adult	388378	3886911	Calling
May 24	adult	388521	3887500	
May 26	adult	387521	3886056	
May 26	pair perched	388707	3886639	Pair on fence

UTM coordinates in CONUS NAD 83 Zone 11S

TABLE 3. PLANT SPECIES

Scientific Name	Common Name	Notes
<i>APIACEAE</i>	<i>Carrot Family</i>	
<i>Lomatium mohavense</i>	Mojave desert parsley	Annual
<i>ASTERACEAE</i>	<i>Composite Family</i>	
<i>Acamptopappus sphaerocephalus</i>	Goldenhead	Shrub; common in Creosote Bush Scrub,(CBS)Sect. 34
<i>Ambrosia acanthicarpa</i>	Annual bur-sage	Annual; disturbed roadside areas
<i>Ambrosia dumosa</i>	Burrobush	Shrub; common in lower elevations, (CBS) Sect. 34
<i>Anisocoma acaulis</i>	Scale-bud	Annual
<i>Artemesia dracunculus</i>	Tarragon	Perennial; occas. in washes, drainage areas, Sect. 31
<i>Baccharis sp.</i>	Baccharis	Perennial shrub; occurs in washes, drainage areas
<i>Calycoseris parryi</i>	Yellow Tack-Stem	Annual
<i>Chaenactis fremontii</i>	Desert pincushion	Annual
<i>Chaenactis sp.</i>	Desert pincushion	Annual
<i>Chrysothamnus nauseosus</i>	Rubber Rabbitbrush	Shrub; abundant on roadsides/old highway 58/aqueduct/washes/disturbed habitat in all sections; highly variable
<i>Chrysothamnus teretifolius</i>	Roundleaf Rubberbrush	Shrub; common in Juniper Woodland (JW) , Sect. 34, 28, 31; occasional in Sect. 26
<i>Cirsium sp.</i>	Thistle	Perennial; occasional in Sect. 31
<i>Coreopsis bigelovii</i>	Bigelow's coreopsis	Annual
<i>Encelia actonii</i>	Acton Encelia	Shrub; occasional to common in all sections
<i>Ericameria cooperi</i>	Cooper's goldenbush	Shrub; common in CBS, Sect. 34, 26, east 28
<i>Ericameria linearifolia</i>	Interior goldenbush	Shrub; common in Joshua tree Woodland (JTW) and JW , all sections
<i>Eriophyllum pringlei</i>	Wooly sunflower	Annual
<i>Gutierrezia microcephala</i>	Snakeweed	Shrub; common on roadsides or wash edges in Sect. 34, 26, 28, 31
<i>Hymenoclea salsola</i>	Cheesebush	Shrub; common on dry flats and slopes, abundant in washes, Sect. 34, 26
<i>Lasthenia californica</i>	Goldfield	Annual
<i>Lepidospartum squamatum</i>	Scale-broom	Shrub; abundant in sandy or gravelly washes, Sect. 26, 28, 31
<i>Malacothrix glabrata</i>	Desert dandelion	Annual
<i>Malacothrix coulteri</i>	Snake's-head	Annual
<i>Rafinesquia neomexicana</i>	Desert chicory	Annual
<i>Stephanomeria exigua</i>	Annual mitra	Annual
<i>Stephanomeria parryi</i>	Parry rock pink	Herbaceous perennial; occasional on roadsides and dry, open areas
<i>Stephanomeria pauciflora</i>	Chuckwalla's delight	Herbaceous perennial; occasional on

TABLE 3. PLANT SPECIES

Scientific Name	Common Name	Notes
<i>Stylocline psilocarphoides</i>	Peck nest straw	roadsides and dry slopes/flats, all sections Annual
<i>Syntrichopappus fremontii</i>	False wooly daisy	Annual
<i>Tetradymia stenolepis</i>	Mojave horsebrush	Shrub; occasional in JTW, Sect. 26
<i>Uropappus lindleyi</i>	Silver puffs	Annual
<i>Xylorhiza tortifolia</i>	Mojave aster	Shrub; occasional to common in JTW, Sect. 34, 26, also on gray substrate in Sect. 34
BORAGINACEAE	Borage Family	
<i>Amsinckia tessellata</i>	Checker fiddleneck	Annual
<i>Cryptantha circumscissa</i>	Western forget-me-not	Annual
<i>Cryptantha decipiens</i>	Gravel forget-me-not	Annual
<i>Cryptantha micrantha</i>	Purple-rooted forget-me-not	Annual
<i>Cryptantha nevadensis</i>	Nevada forget-me-not	Annual
<i>Cryptantha pterocarya</i>	Wing-nut forget-me-not	Annual
<i>Pectocarya heterocarpa</i>	Chuckwalla comb-bur	Annual
<i>Pectocarya recurvata</i>	Arched-nutted comb-bur	Annual
<i>Pectocarya sp.</i>	Comb-bur	Annual
<i>Plagiobothrys arizonicus</i>	Arizona popcorn-flower	Annual
BRASSICACEAE	Mustard Family	
<i>Brassica nigra</i>	Black mustard	Annual
<i>Caulanthus cooperi</i>	Cooper caulanthus	Annual
<i>Descurainia pinnata</i>	Tansy mustard	Annual
<i>Descurainia sophia</i>	Herb sophia	Annual
<i>Guillenia lasiophylla</i>	California mustard	Annual
<i>Hirschfeldia incana</i>	Shortpod mustard	Annual
<i>Lepidium fremontii</i>	Desert alyssum	Shrub; occasional in JTW, Sect. 34, 26, 28
<i>Lepidium lasiocarpum var. lasiocarpum</i>	Peppergrass	Annual
<i>Sisymbrium altissimum</i>	Tumble mustard	Annual
<i>Sisymbrium orientale</i>	Indian hedge mustard	Annual
<i>Stanleya pinnata var. pinnata</i>	Prince's plume	Perennial; occasional on gray substrate in Sect. 34, also Sect. 31
<i>Tropidocarpum gracile</i>	Slender keel fruit	Annual
CACTACEAE	Cactus Family	
<i>Cylindropuntia echinocarpa</i>	Silver cholla	Occasional in CBS and JTW, Sect. 34, 26
<i>Opuntia basilaris</i>	Beavertail cactus	Occasional in all habitats and sections
CAPPARACEAE	Caper Family	
<i>Isomeris arborea</i>	Bladderpod	Shrub; common in CBS, JTW, JW, Sect. 26, 28

TABLE 3. PLANT SPECIES

Scientific Name	Common Name	Notes
<i>CHENOPODIACEAE</i>	Goosefoot Family	
<i>Atriplex canescens</i>	Fourwing Saltbush	Shrub; occasional to common along aqueduct, railroad and roadsides, Sect. 26, 31
<i>Chenopodium album</i>	Lamb's quarters	Annual
<i>Grayia spinosa</i>	Hop-sage	Shrub; occasional to common in CBS, Sect. 34, 26, 28
<i>Krascheninnikovia lanata</i>	Winterfat	Shrub; common on sandy/gravelly slopes in CBS, JTW in Sect. 34, 26, 28
<i>Salsola tragus</i>	Tumbleweed	Annual
<i>CUPRESSACEAE</i>	Cypress Family	
<i>Juniperus californicus</i>	California juniper	Shrub/tree; common to abundant, north Sect 34, Sect. 28 (more abundant in west Sect. 28) and 31
<i>EPHEDRACEAE</i>	Ephedra Family	
<i>Ephedra nevadensis</i>	Nevada joint-fir	Shrub; common-abundant in CBS, JTW, Sect. 34, 26
<i>Ephedra viridis</i>	Green ephedra	Shrub; common-abundant in JTW, JW, Sect.28, 31
<i>EUPHORBIACEAE</i>	Spurge Family	
<i>Chamaecyse albomarginata</i>	White-margin sandmat	Annual
<i>FABACEAE</i>	Legume Family	
<i>Astragalus sp.</i>	Milkvetch	Perennial
<i>Lotus humistratus</i>	Short-podded lotus	Annual
<i>Lotus strigosus</i>	Stiff-haired lotus	Annual
<i>Lupinus microcarpus var. horizontalis</i>	Chick lupine	Annual
<i>Lupinus odoratus</i>	Mojave lupine	Annual
<i>Lupinus sp. 3</i>	Lupine	Annual
<i>Lupinus sp. 4</i>	Bush Lupine	Perennial
<i>GERANIACEAE</i>	Geranium Family	
<i>Erodium cicutarium</i>	Storksbill, Filaree	Annual
<i>HYDROPHYLLACEAE</i>	Waterleaf Family	
<i>Phacelia fremontii</i>	Fremont's phacelia	Annual
<i>Phacelia tanacetifolia</i>	Tansy-leafed phacelia	Annual
<i>Phacelia distans</i>	Lace-leaf phacelia	Annual
<i>LAMIACEAE</i>	Mint Family	
<i>Marrubium vulgare</i>	Horehound	Shrub; occas. to common along aqueduct, Sect. 26
<i>Salvia carduacea</i>	Thistle sage	Annual
<i>Salvia columbariae</i>	Chia	Annual
<i>Salvia dorii</i>	Blue or purple sage	Shrub; occasional in JTW, JW, Sect. 34, 28

TABLE 3. PLANT SPECIES

Scientific Name	Common Name	Notes
LILIACEAE	Lily Family	
<i>Calochortus kennedyi</i> var. <i>kennedyi</i>	Desert mariposa lily	Perennial from bulb; common
<i>Yucca brevifolia</i>	Joshua tree	Tree; occasional to abundant in JTW, often with CBS or JW, Sect. 34, 26, 28, 31
<i>Yucca whipplei</i>	Our lord's candle	Sub-shrub/tree-like; occasional to common in JTW, JW, Sect. 34, 28, 31
LOASACEAE	Loasa Family	
<i>Mentzelia albicaulis</i>	Blazing star	Annual
<i>Petalonyx thurberi</i> ssp. <i>thurberi</i>	Sandpaper plant	Herbaceous perennial; uncommon JW, Sect. 28
LAMIACEAE	Mint Family	
<i>Salazaria mexicana</i>	Bladder sage	Shrub; common in CBS, JTW in Sect. 28
MALVACEAE	Mallow Family	
<i>Eremalche exilis</i>	Small-flowered eremalche	Annual
<i>Sphaeralcea ambigua</i>	Desert mallow	Herbaceous perennial; occasional
NYCTAGINACEAE	Four O'Clock Family	
<i>Mirabilis bigelovii</i>	Wishbone bush	Herbaceous perennial; common in CBS, Sect. 34
ONAGRACEAE	Primrose Family	
<i>Camissonia boothii</i> ssp. <i>desertorum</i>	Booth's desert primrose	Annual
<i>Camissonia campestris</i>	Mojave sun cup	Annual
<i>Camissonia claviformis</i>	Brown-eyed primrose	Annual
<i>Camissonia kernensis</i> ssp. <i>kernensis</i>	Kern County evening primrose	Annual
PAPAVERACEAE	Poppy Family	
<i>Eschscholzia californica</i>	California poppy	Annual
<i>Eschscholzia minutiflora</i>	Little gold poppy	Annual
POACEAE	Grass Family	
<i>Achnatherum hymenoides</i>	Indian rice grass	Perennial bunchgrass; occasional to common in sandy areas, Sect. 34, 26, 28
<i>Achnatherum speciosum</i>	Desert needle grass	Perennial bunchgrass; abundant in CBS, JTW, JW, all sections
<i>Bromus diandrus</i>	Ripgut grass	Annual
<i>Bromus madritensis</i> ssp. <i>rubens</i>	Red brome	Annual
<i>Bromus tectorum</i>	Cheat grass	Annual
<i>Elymus elymoides</i>	Squirreltail	Perennial bunchgrass; all habitats and sections
<i>Hordeum</i> sp.	Wild barley	Annual
<i>Poa secunda</i>	Bluegrass	Perennial bunchgrass; all habitats and sections

TABLE 3. PLANT SPECIES

Scientific Name	Common Name	Notes
<i>Schismus sp.</i>	Split grass	Annual
<i>Vulpia octoflora var. octoflora</i>	Six-weeks fescue	Annual; sandy soils in CBS
POLEMONIACEAE	Phlox Family	
<i>Eriastrum densifolium</i> <i>ssp. mohavense</i>	Woolly star-flower	Herbaceous perennial; occasional
<i>Eriastrum eremicum ssp. eremicum</i>	Eriastrum	Annual
<i>Gilia latiflora ssp. davyi</i>	Broad-flowered gilia	Annual
<i>Gilia sp. 2</i>	Gilia	Annual
<i>Linanthus aureus</i>	Golden gilia	Annual
<i>Linanthus dichotomus</i>	Evening snow	Annual
<i>Linanthus parryi</i>	Parry's linanthus	Annual
<i>Loeseliastrum matthewsii</i>	Desert calico	Annual
<i>Loeseliastrum schottii</i>	Schott's gilia	Annual
POLYGONACEAE	Buckwheat Family	
<i>Centrostegia thurberi</i>	Thurber's spineflower	Annual
<i>Chorizanthe brevicornu var. brevicornu</i>	Spiny-herb	Annual
<i>Chorizanthe watsonii</i>	Watson's spineflower	Annual
<i>Eriogonum angulosum</i>	Angle-stemmed buckwheat	Annual
<i>Eriogonum brachyanthum</i>	Yellow buckwheat	Annual
<i>Eriogonum deflexum var. deflexum</i>	Skeleton weed	Annual
<i>Eriogonum fasciculatum var. polifolium</i>	California buckwheat	Shrub; abundant in CBS, JTW, JW, all sections
<i>Eriogonum gracilimum</i>	Slender-stemmed buckwheat	Annual
<i>Eriogonum inflatum</i>	Desert trumpet	Herbaceous perennial, in JW, Section 31
<i>Eriogonum mohavense</i>	Mohave buckwheat	Annual
<i>Eriogonum nudum</i>	Naked buckwheat	Herbaceous perennial, in JW, Sections 31
<i>Eriogonum plumatella</i>	Flattop buckwheat	Shrub; occasional in JTW, Sect. 34, 26
<i>Eriogonum pusillum</i>	Yellow-turbans	Annual
<i>Eriogonum sp.</i>	Buckwheat	Perennial
<i>Eriogonum tricopes</i>	Buckwheat	Annual; common on gray substrate in Sect. 34
<i>Oxytheca perfoliata</i>	Punctured Bract	Annual
PORTULACACEAE	Purslane Family	
<i>Calyptridium monandrum</i>	Sand-cress	Annual
RANUNCULACEAE	Buttercup Family	
<i>Delphinium parishii ssp. parishii</i>	Parish's larkspur	Perennial; occasional in CBS
ROSACEAE	Rose Family	
<i>Amelanchier utahensis</i>	Service-berry	Shrub; occasional in JW, Sect. 31
<i>Purshia tridentata</i>	Antelope bush	Shrub; occasional in JW, Sect. 28, 31

TABLE 3. PLANT SPECIES

Scientific Name	Common Name	Notes
<i>SCROPHULARIACEAE</i>	Figwort Family	
<i>Castilleja exerta</i>	Purple owls clover	Annual
<i>Penstemon incertus</i>	Western desert penstemon	Shrub; occasional in JTW, JW, Sect. 28
<i>SOLANACEAE</i>	Nightshade Family	
<i>Datura wrightii</i>	Jimson weed	Annual to herbaceous perennial
<i>Lycium andersonii</i>	Anderson's thornbush	Shrub; occasional to common in CBS, Sect. 34, 26
<i>Lycium cooperi</i>	Cooper's thornbush	Shrub; common, especially in low drainage areas in all habitats and sections
<i>ZYGOPHYLLACEAE</i>	Caltrop Family	
<i>Larrea tridentata</i>	Creosote	Shrub; abundant in CBS and JTW of Section 34, 26, and northeastern area of 28

TABLE 4. MAMMAL SPECIES

Scientific Name	Common name	Notes
<i>Dipodomys merriami</i>	Merriam's kangaroo rat	
<i>Neotoma lepida</i>	Desert wood rat	
<i>Ammospermophilus leucurus</i>	White-tailed antelope ground squirrel	
<i>Spermophilus beecheyi</i>	California Ground squirrel	
<i>Lepus californicus</i>	Black-tailed jackrabbit	
<i>Felis rufus</i>	Bobcat	sign
<i>Canis latrans</i>	Coyote	pup and adult seen
<i>Vulpes macrotis</i>	Kit fox	sign
<i>Ovis aries</i>	Domestic sheep	sign

TABLE 5. REPTILE SPECIES

Scientific Name	Common name	Notes
<i>Gopherus agassizii</i>	Desert tortoise	USFWS, CDFG threatened
<i>Phrynosoma platyrhinos</i>	Desert horned lizard	
<i>Gambelia wislizenii</i>	Long-nosed leopard lizard	
<i>Dipsosaurus dorsalis</i>	Desert iguana	
<i>Xantusia vigilis</i>	Desert night lizard	
<i>Sceloporus magister</i>	Desert spiny lizard	
<i>Uta stansburiana</i>	Side-blotched lizard	
<i>Callisaurus draconoides</i>	Zebra-tailed lizard	
<i>Aspidoscelis tigris</i>	Western whiptail	
<i>Masticophis flagellum</i>	Coachwhip	
<i>Pituophis melanoleucus</i>	Gopher snake	
<i>Lampropeltis getula</i>	Common kingsnake	

TABLE 6. BIRD SPECIES

Scientific Name	Common name	Notes
<i>Aquila chrysaetos</i>	Golden eagle	seen flying
<i>Callipepla californica</i>	California quail	
<i>Zenaidura macroura</i>	Mourning dove	
<i>Bubo virginianus</i>	Great-horned owl	pellets seen
	Unknown hummingbird	
<i>Picoides scalaris</i>	Ladder-backed woodpecker	
<i>Myiarchus cinerascens</i>	Ash-throated flycatcher	
<i>Tyrannus verticalis</i>	Western kingbird	
<i>Lanius ludovicianus</i>	Loggerhead shrike	CDFG-SSC, USFWS-BCC
<i>Corvus corax</i>	Common raven	
<i>Aphelocoma californica</i>	Western scrub jay	
<i>Eremophila alpestris</i>	Horned lark	
<i>Aeronautes saxatalis</i>	White-throated swift	
<i>Campylorhynchus brunneicapillus</i>	Cactus wren	
<i>Salpinctes obsoletus</i>	Rock wren	
<i>Mimus polyglottos</i>	Northern mockingbird	
<i>Toxostoma lecontei</i>	Le Conte's thrasher	CDFG-SSC, USFWS-BCC
<i>Oporornis tolmiei</i>	MacGillivray's warbler	
<i>Spizella passerina</i>	Chipping sparrow	
<i>Spizella breweri</i>	Brewer's sparrow	
<i>Chondestes grammacus</i>	Lark sparrow	
<i>Amphispiza bilineata</i>	Black-throated sparrow	
<i>Amphispiza belli</i>	Sage sparrow	
<i>Sturnella neglecta</i>	Western meadowlark	
<i>Euphagus cyanocephalus</i>	Brewer's blackbird	
<i>Icterus bullockii</i>	Bullock's oriole	
<i>Icterus parisorum</i>	Scott's oriole	
<i>Carpodacus mexicanus</i>	House finch	
<i>Carduelis lawrencei</i>	Lawrence's goldfinch	
<i>Carduelis psaltria</i>	Lesser goldfinch	
<i>Carduelis tristis</i>	American goldfinch	

FIGURES

FIGURE 1. SUN CREEK WIND FARM PROJECT LOCATION, KERN COUNTY, CALIFORNIA

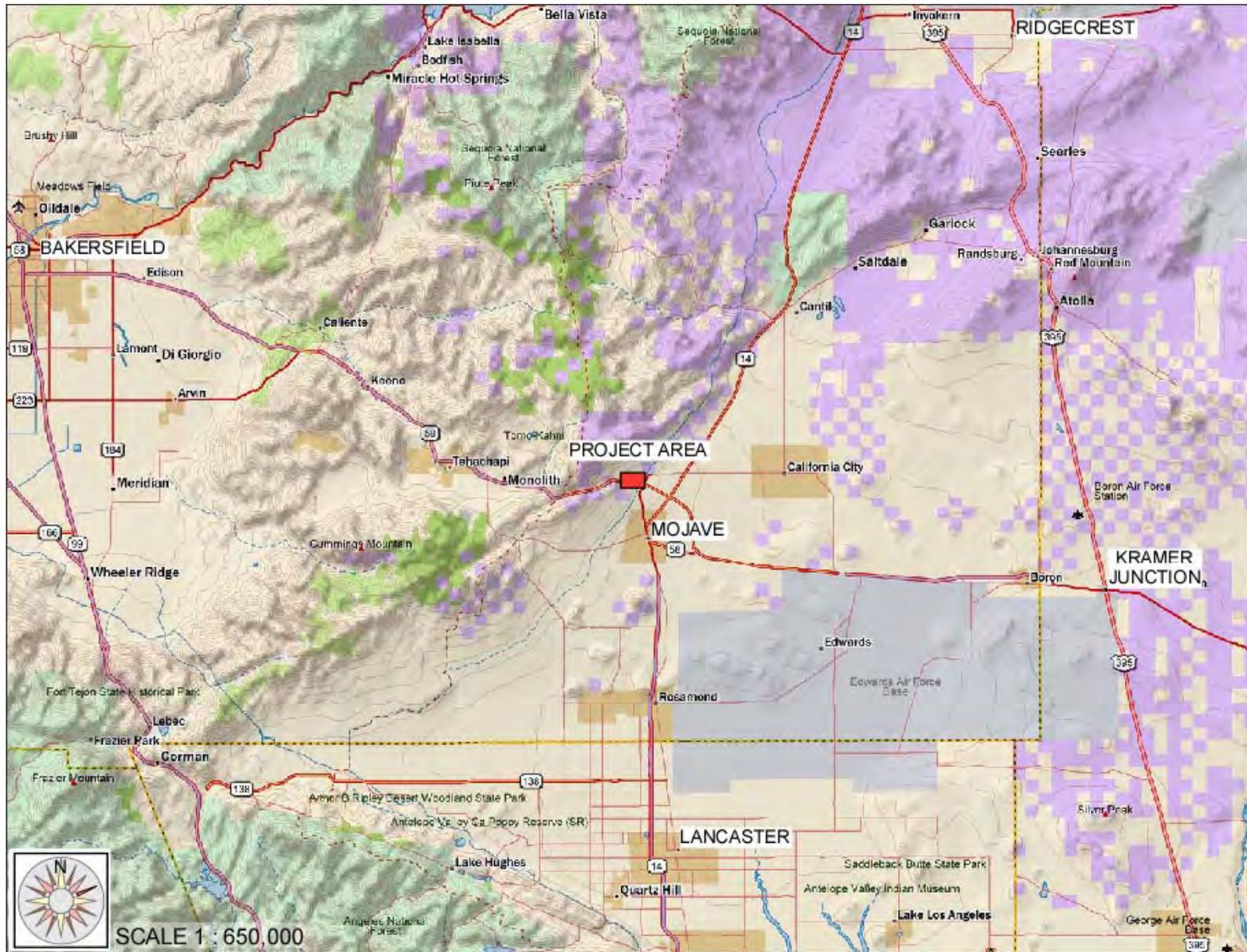


FIGURE 2. DESERT TORTOISE SIGN MAP AND SURVEY AREA ON THE SUN CREEK WIND FARM PROPOSED SITE, KERN COUNTY, CALIFORNIA

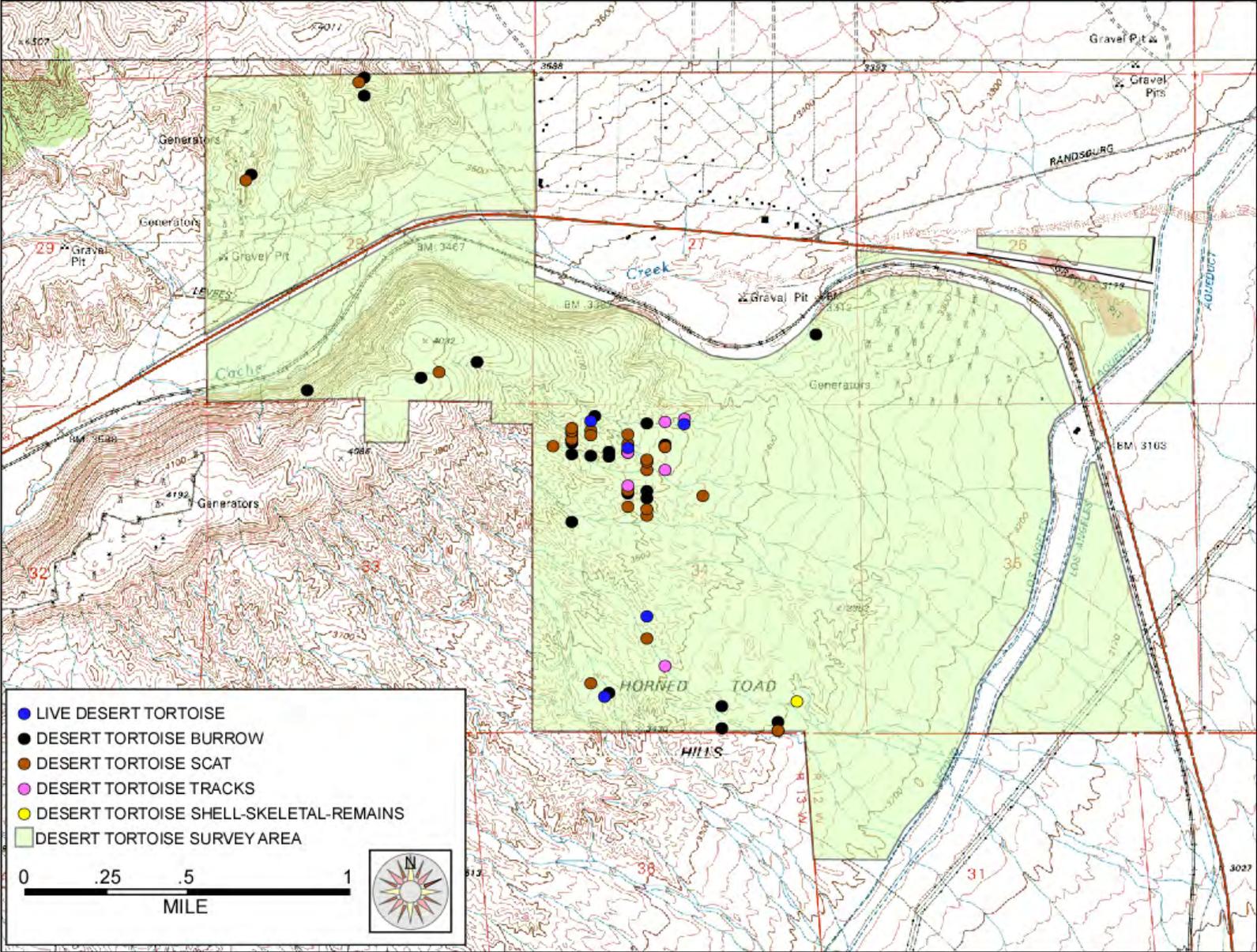


FIGURE 3. SENSITIVE SPECIES OBSERVED ON THE SUN CREEK WIND FARM PROPOSED SITE, KERN COUNTY, CALIFORNIA

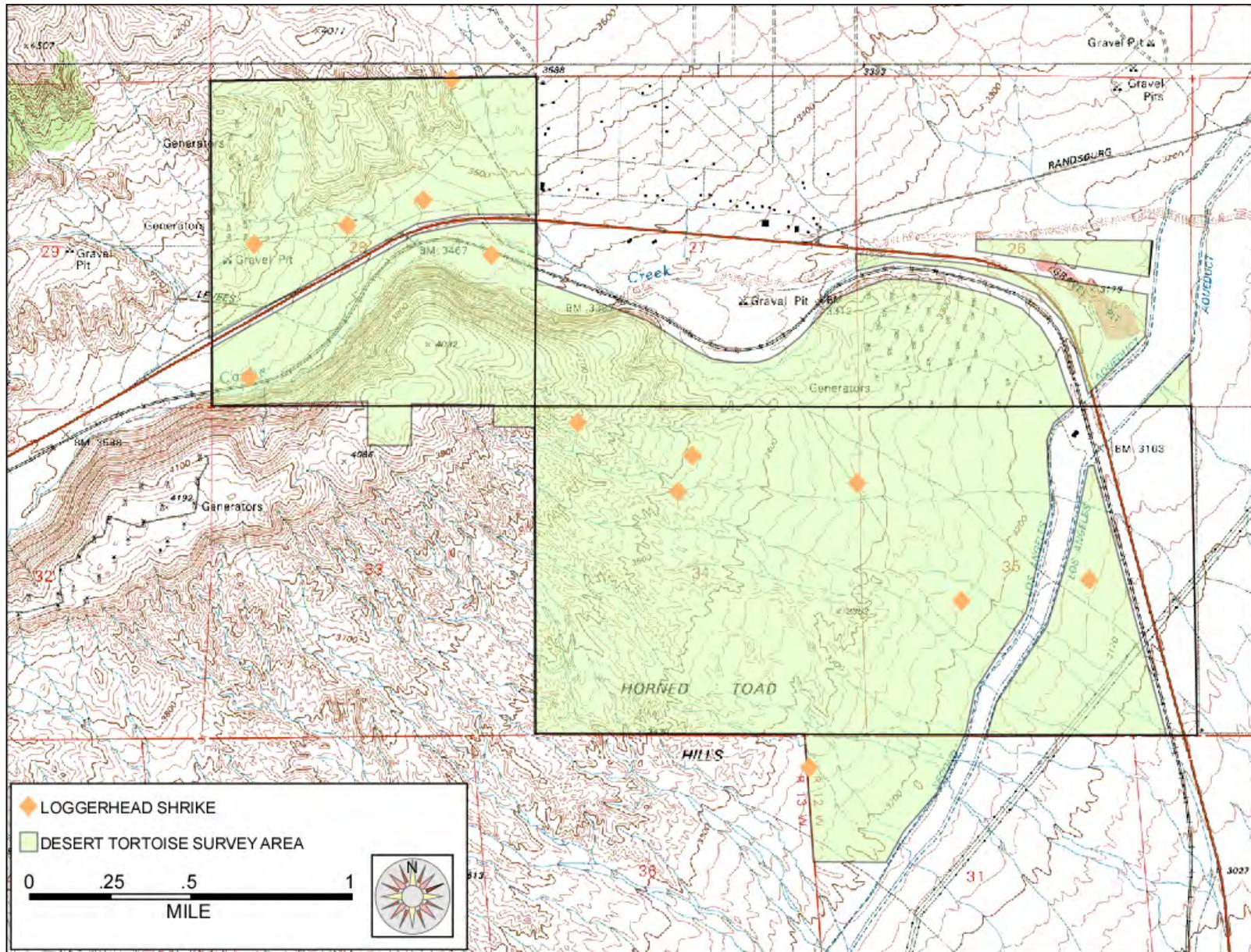


FIGURE 4. HABITAT PHOTOS OF THE SUN CREEK SITE, KERN COUNTY, CALIFORNIA



OHV damage - Section 34



OHV damage - Section 27



OHV damage – Section 34



OHV damage Section 34



Looking west from Section 27 at Section 28, showing steep slope and Cache Cr.



High elevation low desert scrub showing steep drop to north on Section 28.



Creosotebush scrub - Section 35



Joshua Tree-Creosote bush scrub - Section 34



Juniper-Creosote bush scrub interface – Section 34

FIGURE 5. DESERT TORTOISE SIGN PHOTOS ON THE SUN CREEK SITE, KERN COUNTY, CALIFORNIA



Desert tortoise burrow – Joshua tree-Creosote bush scrub



Tortoise burrow with tracks



Juvenile tortoise burrow



Active tortoise burrow



Tortoise scat



Female tortoise under California juniper



Desert tortoise shell-skeletal remains – female