Appendix D-23

Mohave Ground Squirrel Results 2011

SMALL MAMMAL TRAPPING RESULTS FOR THE Alta East WIND ENERGY PROJECT KERN COUNTY, CALIFORNIA

SESSION 1

Prepared for:

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1 Introduction

Alta Windpower Development, LLC proposes to construct the Alta East Wind Project (project) in the Tehachapi region of southern California. Portions of the project would be located on land managed by the U.S. Bureau of Land Management and privately owned land under the jurisdiction of Kern County. William Vanherweg was contracted by CH2M HILL Engineers, Inc. (CH2M HILL) to conduct surveys for Mohave ground squirrel (*Xerospermophilus mohavensis*) and other special-status small mammals.

1.1 Project Description

The proposed development is a wind energy facility with a nameplate capacity rating of approximately 300 megawatts of wind turbine generation and includes ancillary facilities and supporting infrastructure. Up to 120 wind turbine generators would be installed. The project includes repowering a historical wind power project site north of State Route 58 on BLM lands and infilling existing wind facilities south of SR 58 in the area of Cameron Ridge. The project is located 2 miles west of the intersection of Highway 58 and Highway 14 in the Mojave Desert (Figure 1) and is within the Tehachapi Wind Resource Area (WRA) of eastern Kern County.

2 Environmental Setting

The project area falls within the Mojave Basin and Range ecoregion. This ecoregion is characterized by scattered, generally low-elevation mountains. Much of the land in this ecoregion is federally owned. Some areas have experienced severe wind and water erosion problems have been linked to extensive off highway vehicle (OHV) use, overgrazing and fire (USEPA, 2009). The climate in this ecoregion consists of the Mediterranean climate of hot, dry summers and moist, cool winters.

The elevation of the site is approximately 3,000 to 4,400 feet above sea level.

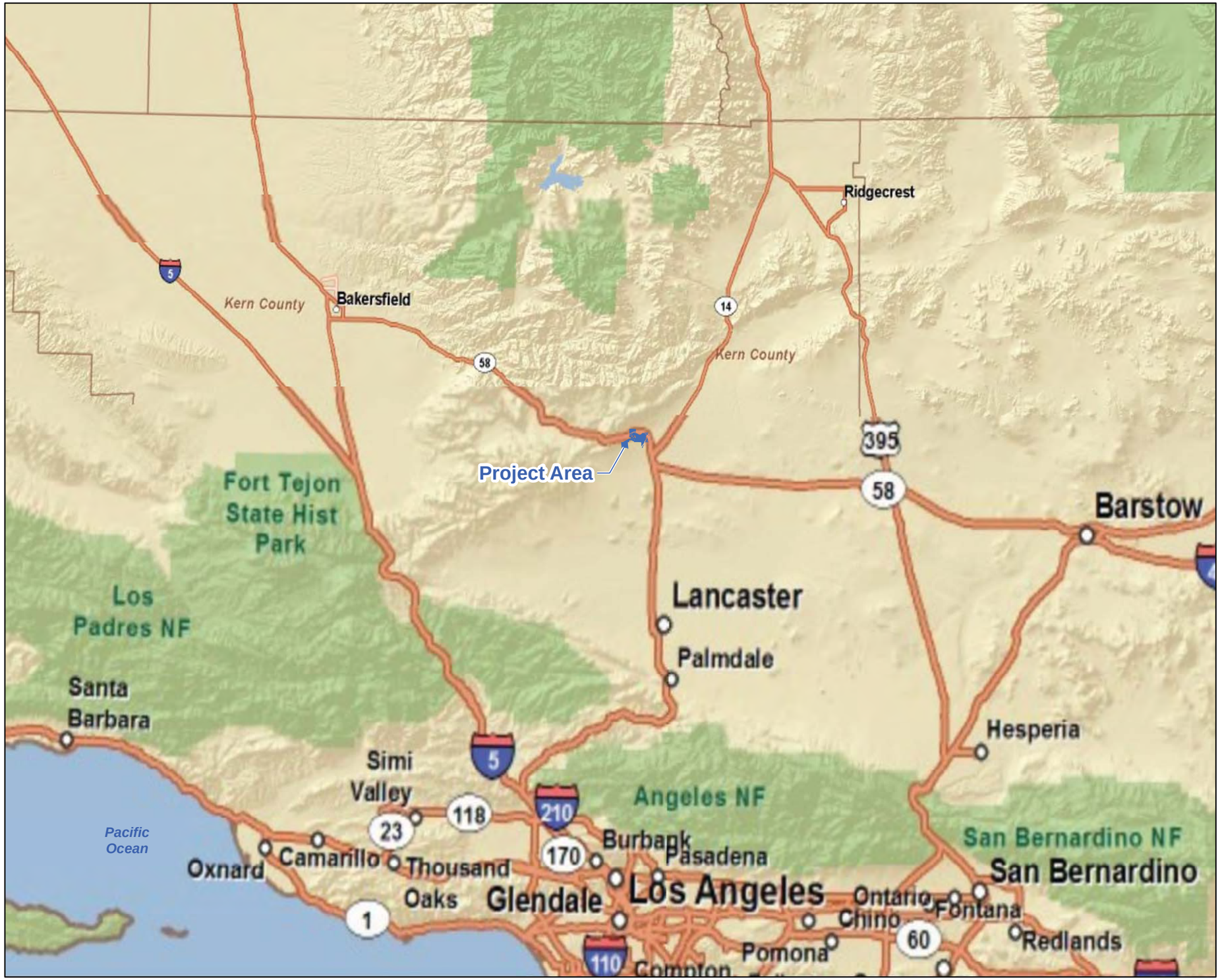
2.1 Current Land Use

The project site exhibits light to heavy disturbance. Human disturbance influencing the project area include: OHV use, urban/industrial development, scattered trash, and State highway 58.

2.2 Vegetation

The project site is predominantly creosote bush (*Larrea tridentata*) scrub habitat with some Joshua tree woodland and mixed Mojave scrub.

Figure 1



VICINITY MAP

LEGEND

Project Area

N

0 7.5 15
Miles

FIGURE 1
Project Vicinity Map
Alta East Wind Project
Alta Wind Energy Center Project

3 Special Status Mammals Natural History

A California Natural Diversity Database (CNDDB) search was conducted for the project area and a ten mile buffer May 27, 2011. The following special-status small mammals were present in the CNDDB search area: Mohave ground squirrel, San Joaquin pocket mouse (*Perognathus inornatus*), and Tehachapi pocket mouse (*Perognathus alticola*), and Tulare grasshopper mouse (*Onychomys torridus tularensis)*. Based on a review of species' ranges two subspecies that appear in the database search, Tulare grasshopper mouse does not occur in the project area (Hall 1981). Tulare grasshopper mice are known only from west of the project site in the San Joaquin Valley and the Carrizo Plain. The subspecies that occurs in the project area is *O. t. pulcher* and is not considered a special status taxon (Hall 1981). Therefore, Tulare grasshopper mouse was not included in this investigation. This report addresses trapping for Mohave ground squirrel, Mojave pocket mouse, and Tehachapi pocket mouse.

3.1 Mohave Ground Squirrel

Mohave ground squirrels are approximately 8.5 - 9 inches in length and can be found in desert scrub habitats. Activity periods for this species vary and little is known about their reproduction (Ingles 1979). Their diet consists of seeds, vegetative parts of desert plants including fruits of the Joshua tree. Due to the aridity and high temperatures of its environment they are a diurnal species spending up to seven months underground. The Mohave ground squirrel is listed as threatened by CDFG. The species is currently being considered for listing under the federal Endangered Species Act as endangered (75 Fed. Reg. 22063).

3.2 San Joaquin Pocket Mouse

The San Joaquin pocket mouse is relatively small with adults weighing 12-18 grams. Their pelage is light brown to cinnamon with white bellies. They are nocturnal and are rarely active when temperatures drop below 50^{o} F. They mainly eat small seeds of grasses and forbs but have been known to eat cutworms (Best 1993). The species is generally associated with annual grassland and oak habitat (Laabs and Allaback 2002), but has also been captured in all desert scrub habitats, Joshua tree woodland, juniper woodland, and other higher elevation scrub habitats (Vanherweg personal experience). The San Joaquin pocket mouse is a state species of special concern, which does not confer any legal protections, but rather calls attention to a species that may be listed at some time in the future. Recent work by David Laabs and Mark Allaback indicate that the San Joaquin pocket mice found in the Tehachapi Mountains and western Mojave Desert, which includes the project area, are most likely a new taxon, the Mohave pocket mouse (*Perognathus* sp.*)*.

3.3 Tehachapi Pocket Mouse

The Tehachapi pocket mouse is medium-sized for the genus, averaging (5.9 and 6.5 in.) in total length and 16-28 grams for females and males, respectively (Best, 1994). Little is known about the ecology of the Tehachapi pocket mouse. Other members of the genus are nocturnal granivores, foraging primarily on seeds of grasses, forbs and annuals, but also on leafy plant material and insects (Verts and Kirkland, 1988). Most other members of the genus exhibit seasonal hibernation (Verts and Kirkland, 1988). The Tehachapi pocket mouse occupies native and non-native grasslands, Joshua tree woodland, pinyon-juniper woodland, yellow pine woodland and oak savannah (Williams et al., 1993). It constructs burrows in loose, sandy soils. The Tehachapi pocket mouse is a state species of special concern, which does not confer any legal protections, but rather calls attention to a species that may be listed at some time in the future.

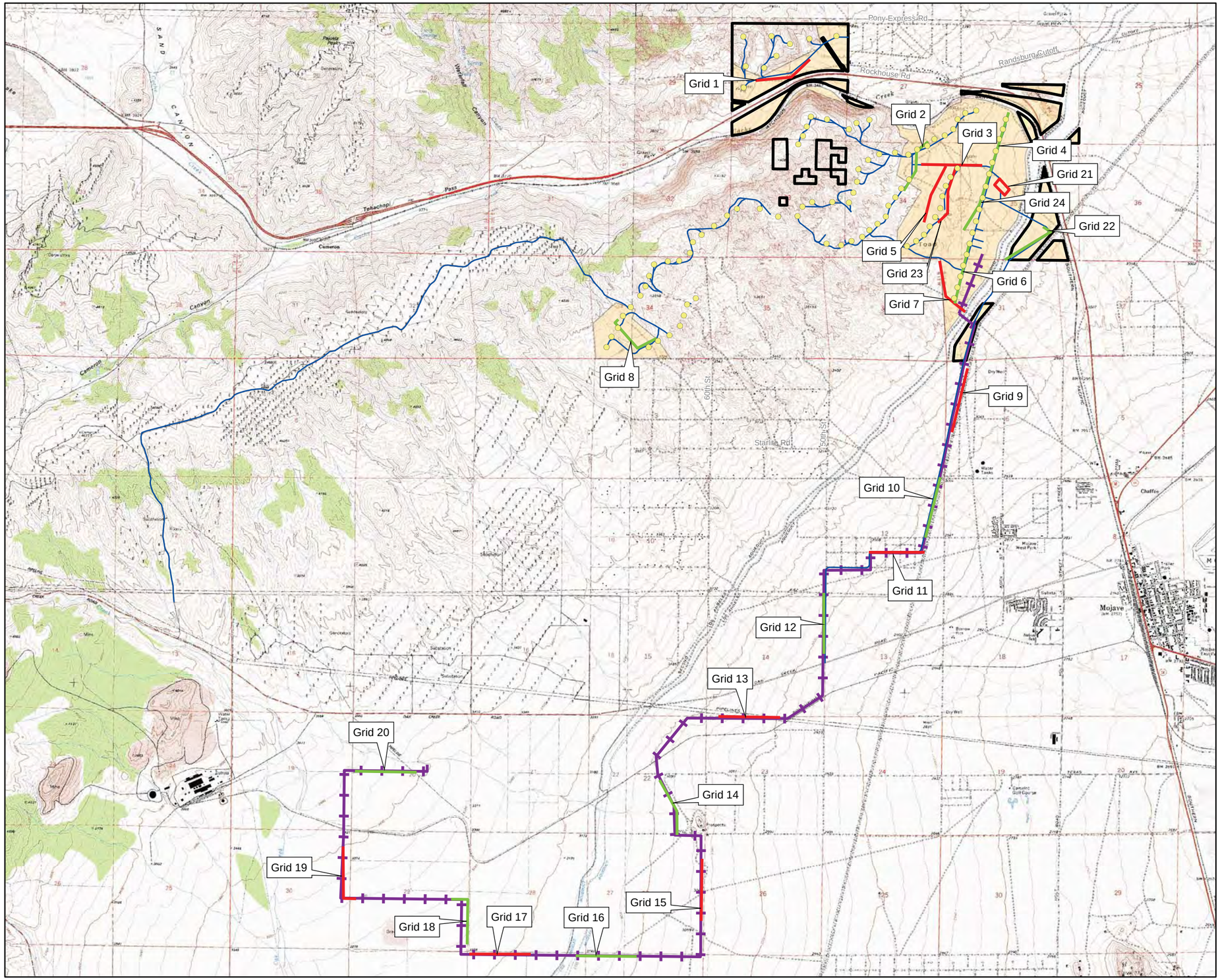
4 Methods

4.1 Mohave Ground Squirrel

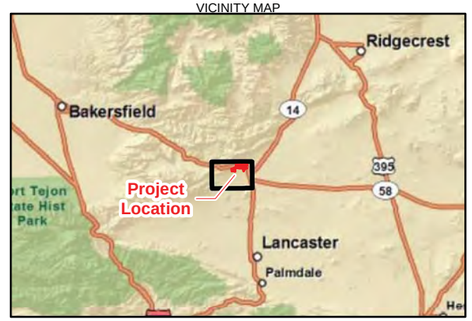
Surveys for Mohave ground squirrels were consistent with the survey guidelines issued by CDFG (CDFG, 2003)(Appendix A). An evaluation of habitat suitability was conducted in June 2010 (Vanherweg 2010). In spring 2011, a map displaying suitable habitat and proposed trapping grids was submitted to Justin Sloan at CDFG for review. Twenty-four trapping grids were established along linear portions of the project including proposed turbine strings, transmission lines, access roads, and at a laydown area (Figure 2). The trapping grids along the proposed linear developments were arranged in 4 traps wide by 25 traps long configurations, the laydown area had a 10 traps wide by 10 traps long configuration as per CDFG protocol. The first session of trapping was conducted between 15 March and 30 April. The second and third sessions will be conducted between 1 May and 15 July per the CDFG protocol. The results of all three trapping sessions will reported in summer 2011.

4.2 Other Special-status Small Mammals

Nocturnal trapping for Tehachapi pocket mouse and Mojave pocket mouse in appropriate habitats of the proposed project area (Figure 2) will be conducted in July and August 2011.



VICINITY MAP



LEGEND

- Proposed Wind Turbine Layout
- Proposed Access Roads
- Transmission Line
- Mohave Ground Squirrel Potential Habitat Area within the Project Boundary

Mohave Ground Squirrel Trapping Grid Line

- Grids 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21 & 23
- Grids 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 & 24
- Alta East Wind Energy Project Area

Notes:
Trapping Grid lines were grouped by color for visual clarity only and do not represent any differences in method or approach.

N

0 2,000 4,000
Feet

FIGURE 2
Mohave Ground Squirrel Trapping Grids
Alta East Wind Energy Project
Kern County, California

CH2MHILL

5 Results

No Mohave ground squirrels were captured during the first session of trapping. Trapping for the other special status species have not been completed. Table 1 contains the general results of the Mojave ground squirrel trapping survey to date. Habitat descriptions of each grid, daily weather conditions, and results of our trapping efforts can be found in Appendix B.

Table 1. Total Number of Captures per Species per Grid.

Total Captures Per Grid Per Species			
Grid	Mohave ground squirrel	White-tailed antelope squirrel	California Ground squirrel
1	0	10	0
2	0	25	0
3	0	28	0
4	0	55	0
5	0	22	0
6	0	36	0
7	0	25	0
8	0	1	0
9	0	23	0
10	0	33	0
11	0	22	0
12	0	15	0
13	0	5	0
14	0	41	0

15	0	46	0
16	0	68	0
17	0	52	0
18	0	17	0
19	0	22	0
20	0	30	5
21	0	21	0
22	0	33	0
23	0	16	0
24	0	50	4

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Appendix A – CDFG Mohave Ground Squirrel Trapping Protocol

CALIFORNIA DEPARTMENT OF FISH AND GAME
MOHAVE GROUND SQUIRREL SURVEY GUIDELINES
(January 2003)

1. Visual surveys to determine Mohave ground squirrel activity and habitat quality shall be undertaken the period of 15 March through 15 April. All potential habitat on a project site shall be visually surveyed during daylight hours by a biologist who can readily identify the Mohave ground squirrel and the white-tailed antelope squirrel (*Ammospermophilus leucurus*).

2. If visual surveys do not reveal presence of the Mohave ground squirrel on the project site, standard small-mammal trapping grids shall be established in potential Mohave ground squirrel habitat. The number of grids will depend on the amount of potential habitat on the project site, as determined by the guidelines presented in paragraphs 4 and 5 of these guidelines.

3. For linear projects (for example, highways, pipelines, or electric transmission lines), each sampling grid shall consist of 100 Sherman live-traps (or equivalent; the minimum length of any trap is 12 inches) arranged in a rectangular pattern, 4 traps wide by 25 traps long, with traps spaced 35 meters apart along each of the four trap lines. At a minimum, one sampling grid of this type shall be established in each linear mile, or fraction thereof, of potential Mohave ground squirrel habitat along the project corridor.

4. For all other types of projects, one sampling grid consisting of 100 Sherman live-traps (or equivalent; the minimum length of any trap is 12 inches) shall be established for each 80 acres, or fraction thereof, of potential Mohave ground squirrel habitat on the project site. The traps shall be arranged in a 10 x 10 grid, with 35-meter spacing between traps.

5. Each sampling grid shall be trapped for a minimum five consecutive days, unless a Mohave ground squirrel is captured before the end of the five-day term on the grid or on another grid on the project site. If no Mohave ground squirrel is captured on a sampling grid on the project site in the first five-consecutive-day term, each sampling grid shall be sampled for a SECOND five-consecutive-day term. Trapping may be stopped before the end of the second term if a Mohave ground squirrel is captured on any sampling grid on the project site. If no Mohave ground squirrel is captured during the second five-consecutive-day term, each sampling grid shall be sampled for a THIRD five-consecutive -day term. The FIRST trapping term shall begin and be completed in the period of 15 March through 30 April. If a SECOND term is required, it shall begin at least two weeks after the end of the first term, but shall begin no earlier than 01 May, and shall be completed by 31 May. If a THIRD term is required, it shall begin at least two weeks after the end of the second term, but shall begin no earlier than 15 June, and shall be completed by 15 July. All trapping shall be conducted during appropriate weather conditions, avoiding periods of high wind, precipitation, and low temperatures (<50^{o}F or 10^{o}C).

6. For projects requiring two or more sampling grids, capture of a Mohave ground squirrel on any grid will establish presence of the species on the project site. Trapping may be stopped on all grids on the project site at that time. For linear projects, very large project sites, project sites characterized by fragmented or highly-

heterogeneous habitats, or in other special circumstances, continued trapping may be necessary.

7. A maximum 100 traps shall be operated by each qualified biologist. Each trap shall be covered with a cardboard A-frame or equivalent non-metal shelter to provide shade. Trap and shelter orientation shall be on a north-south axis. All traps shall be opened within one hour of sunrise and may be closed beginning one hour before sunset. Traps shall be checked at least once every four hours to minimize heat stress to captured animals. When traps are open, temperature shall be measured at a location within the sampling grid, in the shade, and one foot (approx. 0.3 meters) above the ground at least once every hour. Traps shall be closed when the ambient air temperature at one foot above the ground in the shade exceeds 90°F (32°C). Trapping shall resume on the same day after the ambient temperature at one foot (approx. 0.3 meters) above the ground in the shade falls to 90°F (32°C) and shall continue until one hour before sunset. Suggested baits are mixed grains, rolled oats, or bird seed, with a small amount of peanut butter.

8. A qualified biologist shall complete the Survey and Trapping Form, which is found on page 5 of these guidelines. This biologist, or the lead agency for the project, shall submit the completed form to the appropriate Department office (see page 4) with the biological report on the project site.

9. The Department may allow variation on these guidelines, with the advance written approval of the appropriate regional habitat conservation planning office (see page 4). Such variations could include biologically-appropriate modification of the trapping dates or changes in grid configuration that would enhance the probability of detecting Mohave ground squirrels. Any variation which concerns trapping or marking methods must be incorporated into the MOU or permit that authorizes the work.

10. If a survey conducted according to these guidelines results in no capture or observation of the Mohave ground squirrel on a project site, this is not necessarily evidence that the Mohave ground squirrel does not exist on the site or that the site is not actual or potential habitat of the species. However, in the circumstance of such a negative result, the Department will stipulate that the project site harbors no Mohave ground squirrels. This stipulation will expire one year from the ending date of the last trapping on the project site conducted according to these guidelines.

Appendix B – Trapping Grid Habitat Descriptions, Daily Weather Conditions, and Trapping Results

Grid 1

Visual Surveys were conducted by: Greg Warrick

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS –*Bromus tectorum, Bromus madritensis., Erodium cicutarium, Amsinckia sp.*

DOMINANT PERENNIALS-, *Yucca brevifolia, Ephedra trifurca, Eriogonum fasciculatum, Ericameria* sp.*,* Achnatherum sp., *Poa* sp., *Hymenoclea salsola,*

OTHER PERENNIALS- Juniperus californicus, *Tetradymia spinosa, Encelia farinosa, Grayia spinosa, Krascheninnikovia lanata, Lycium andersonii, Yucca sp., Opuntia* spp.*, Lepidospartum squamatum, Larrea tridentata.*

Elevation – Approx. 3,500 to 3,600 ft **Slope –** 0% - 5%

Trapping conducted by: Greg Warrick

Grid 1
First Sampling Term

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS*	MGS*	AM	PM	AM	PM
4/11/2011	0638	42	0	0	90%	30%	5-10	10-15
	1514	65						
4/12/2011	0710	52	4	0	40%	CLEAR	10-15	10-15
	1500	71						
4/13/2011	0701	48	2	0	10%	20%	10-15	25-30
	1507	46						
4/14/2011	0639	42	1	0	CLEAR	5%	5-10	5-10
	1439	67						
4/15/2011	0643	49	3	0	5%	1%	0-5	5-10
	1457	72						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grids 2-5

Visual Surveys were conducted by: William Vanherweg

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS –*Bromus tectorum, Bromus madritensis., Erodium cicutarium, Amsinkia sp.*

DOMINANT PERENNIALS-*, Larrea tridentata Yucca brevifolia, Ephedra trifurca, Eriogonum fasciculatum, Ericameria* sp.*,* Achnatherum sp., *Poa* sp., *Hymenoclea salsola,*

OTHER PERENNIALS- Juniperus californicus, *Tetradymia spinosa, Encelia farinosa, Grayia spinosa, Krascheninnikovia lanata, Lycium andersonii, Yucca* sp.*, Opuntia* sp.*, Lepidospartum squamatum.*

Elevation – Approx. 3,200 to 3,300 ft **Slope –** 0% - 5%

Trapping conducted by: William and Paul Vanherweg

Grid 2 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
3/31/2011	0700	61	4	0	0%	0%	0	0
	1500	85						
4/1/2011	0700	59	7	0	0%	0%	0	0-5
	1530	86						
4/2/2011	0700	61	7	0	30%	30%	0-5	5-10
	0845	73						
4/3/2011	0700	51.7	2	0	30%	0%	0-5	5-10
	1600	65						
4/4/2011	0700	48	5	0	0%	0%	0-5	0-5
	1530	72						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 3 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
3/31/2011	0700	61	10	0	0%	0%	0	0
	1500	85						
4/1/2011	0700	59	8	0	0%	0%	0	0-5
	1530	86						
4/2/2011	0700	61	4	0	30%	30%	0-5	5-10
	0845	73						
4/3/2011	0700	51.7	3	0	30%	0%	0-5	5-10
	1600	65						
4/4/2011	0700	48	3	0	0%	0%	0-5	0-5
	1530	72						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 4 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
3/26/2011	0700	42	0	0	50%	100%	5-10	10-20
	1500	52						
3/27/2011	0700	48	16	0	50%	5%	0-5	0-5
	1530	60						
3/28/2011	0700	51	13	0	5%	0%	0-5	0-5
	0845	62						
3/29/2011	0700	45	14	0	5%	60%	0-5	5-10
	1600	74						
3/30/2011	0700	47	12	0	10%	50%	0-5	0-5
	1530	79						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 5 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/5/2011	0700	58	9	0	0%	0%	0-5	5-10
	1500	77						
4/6/2011	0700	52	2	0	80%	0%	5-10	5-10
	1530	69						
4/7/2011	0700	43	4	0	0%	100%	10-15	15-20
	1400	53						
4/8/2011	0830	40	4	0	0%	100%	5-10	5-10
	1200	45						
4/9/2011	0830	40	3	0	0%	10%	0-5	15-20
	1500	52						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grids 6 and7

Visual Surveys were conducted by: Gin Ingrahm

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS *–Bromus tectorum, Bromus madritensis., Erodium cicutarium, Amsinkia sp.*

DOMINANT PERENNIALS-, *Larrea tridentate, Yucca brevifolia, Ephedra trifurca, Eriogonum fasciculatum, Ericameria* sp., Achnatherum sp., *Poa* sp., *Hymenoclea salsola,*

OTHER PERENNIALS-, *Tetradymia spinosa, Encelia farinosa, Grayia spinosa, Krascheninnikovia lanata, Lycium andersonii, Yucca* sp., *Opuntia* sp., *Lepidospartum squamatum.*

Elevation – Approx. 3,000 to 3,200 ft **Slope –** 0% - 5%

Trapping conducted by: Gin Ingrahm

First Term Grid #6

DATE	TIME	TEMP F air/gnd	CAPTURES		Cloud Cover		Wind speed (Mi/hr)/Dir.	
			AGS	MGS	AM	PM	AM	PM
4/11/2011	630	41/45	10	0	95%	45%	0-5 w	5-10 w
	1530	67/77						
4/12/2011	645	52/56	7	0	20%	0%	5-10 w	10-12 w
	1545	69/73						
4/13/2011	650	47/50	4	0	10%	30%	10-15 nw	15-20 nw
	1550	55/63						
4/14/2011	650	45/45	9	0	5%	5%	0-5 var	5-10 w
	1550	68/72						
4/15/2011	640	43/50	6	0	5%	0%	0-5 se	5-10 w
	1550	75/70						
	1845	53.1						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

First Term Grid #7

DATE	TIME	TEMP F air/gnd	CAPTURES		Cloud Cover		Wind speed (Mi/hr)/Dir.	
			AGS	MGS	AM	PM	AM	PM
4/18/2011	630	55/60	8	0	70%	60%	5-10 w	8-12 w
	1515	70/75						
4/19/2011	620	55/58	7	0	60%	15%	5-10 w	15-18 w
	1530	73/82						
4/20/2011	620	55/56	6	0	30%	40%	5-10 w	20+
	1530	74/77						
4/21/2011	620	54/59	1	0	35%	25%	10-15 w	15-20 w
	1530	67/76						
4/22/2011	620	51/54	3	0	0%	50%	0-5 w	10-15 w
	1600	68/75						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 8

Visual Surveys were conducted by: Bill Vanherweg

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS *–Bromus tectorum, Bromus madritensis., Erodium cicutarium, Amsinkia sp.*

DOMINANT PERENNIALS *Ephedra trifurca, Eriogonum fasciculatum, Ericameria sp.,* Achnatherum sp., *Poa* sp., *Hymenoclea salsola,*

OTHER PERENNIALS-, *Tetradymia spinosa, Encelia farinosa, Krascheninnikovia lanata, Lycium andersonii, Yucca* sp*., Opuntia* sp*., Lepidospartum squamatum.*

Elevation – Approx. 3,600 ft **Slope –** 0% - 5%

Trapping conducted by: Alex Brown

Grid 8 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/16/2011	0630	52.2	0	0	15%	30%	10-15	30+
	1000	54.2						
4/17/2011	0625	53.4	0	0	20%	25%	15-20	30+
	0830	54.6						
4/18/2011	0635	52.1	0	0	25%	60%	15-20	30+
	0845	50.7						
4/19/2011	0640	51.7	1	0	80%	20%	10-15	30+
	1030	62.2						
4/20/2011	0630	48.6	0	0	40%	30%	20-25	30+
	1845	53.1						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grids 9-12

Visual Surveys were conducted by: Gin Ingrahm

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS –*Bromus tectorum, Bromus madritensis., Erodium cicutarium, Amsinkia* sp .

DOMINANT PERENNIALS-, *Larrea tridentate, Yucca brevifolia, Ephedra trifurca, Eriogonum fasciculatum, Ericameria* sp., Achnatherum sp., *Poa* sp., *Hymenoclea salsola,*

OTHER PERENNIALS-, *Tetradymia spinosa, Encelia farinosa, Grayia spinosa, Krascheninnikovia lanata, Lycium andersonii, Yucca* sp., *Opuntia* spp., *Lepidospartum squamatum.*

Elevation – Approx. 3,000 to 3,200 ft **Slope –** 0% - 5%

Trapping conducted by: Gin Ingrahm

First Term Grid #9

DATE	TIME	TEMP F air/gnd	CAPTURES		Cloud Cover		Wind speed (Mi/hr)/Dir.	
			AGS	MGS	AM	PM	AM	PM
4/4/2011	700	42/42	5	0	0%	0%	5-10 n	0-3 w
	1530	72/73						
4/5/2011	700	52/50	8	0	35%	10%	0-5 sw	15-20 sw
	1550	75/77						
4/6/2011	645	50/53	6	0	100%	35%	13-15 w	18-22 w
	1600	68/77						
4/7/2011	645	41/50	2	0	15%	100%	20-25 nw	18-20 nw
	1445	50/57						
4/8/2011	950	43/42	0	0	5%	85%	5-10 w	10-12 sw
	1445	50/66						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

First Term Grid #10

DATE	TIME	TEMP F air/gnd	CAPTURES		Cloud Cover		Wind speed (Mi/hr)/Dir.	
			AGS	MGS	AM	PM	AM	PM
3/28/2011	645	47/46	3	0	35%	15%	0-5 w	15-20 w
	1510	58/66						
3/29/2011	700	48/46	8	0	45%	80%	0-2 n	18-20 sw
	1500	66/68						
3/30/2011	650	44/46	7	0	25%	80%	0-4 nw	0-2 var
	1530	78/66						
3/31/2011	650	54/52	7	0	5%	5%	0-4 nw	0-5 e
	1515	84/70						
4/1/2011	645	55/56	5	0	0%	0%	0-5 nw	5-8 nw
	1600	88/75						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

First Term Grid #11

DATE	TIME	TEMP F air/gnd	CAPTURES		Cloud Cover		Wind speed (Mi/hr)/Dir.	
			AGS	MGS	AM	PM	AM	PM
3/21/2011	1130	50/50	5	0	85%	45%	5-10 w	5-10 w
	1600	53/55						
3/22/2011	830	43/40	4	0	30%	20%	8-10 nw	5-10 w
	1630	56/59						
3/23/2011	730	40/43	2	0	90%	100%	0-5 nw	0-2 w
	1230	56/60						
3/24/2011	745	40/40	5	0	10%	95%	5-8 nw	10-15 nw
	1615	50/55						
3/25/2011	720	40/41	6	0	75%	80%	15-20 nw	15-20 nw
	1100	47/47						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

First Term Grid #12								
DATE	TIME	TEMP F air/gnd	CAPTURES		Cloud Cover		Wind speed (Mi/hr)/Dir.	
			AGS	MGS	AM	PM	AM	PM
3/16/2011	1045	50/51	0	0	0%	0%	5-10 w	20-25 nw
	1400	63/61						
3/17/2011	1045	50/51	4	0	100%	50%	10 nw	20 nw
	1530	65/56						
3/18/2011	945	59/48	5	0	0%	90%	0-5 w	8-10 w
	1445	69/69						
3/19/2011	915	50/47	6	0	95%	100%	5 nw	8-10 nw
	1300	54/57						
3/20/2011	1400	49/49	0	0	100%	100%	10-15 w	10-15 w
	1600	50/52						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grids 13-18

Visual Surveys were conducted by: Bill Vanherweg

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS *–Bromus tectorum, Bromus madritensis., Erodium cicutarium, Amsinkia sp.*

DOMINANT PERENNIALS-, *Larrea tridentate, Yucca brevifolia, Ephedra trifurca, Eriogonum fasciculatum, Ericameria sp.,* Achnatherum sp., *Poa sp*., *Hymenoclea salsola,*

OTHER PERENNIALS-, *Tetradymia spinosa, Encelia farinosa, Grayia spinosa, Krascheninnikovia lanata, Lycium andersonii, Yucca sp., Opuntia sp., Lepidospartum squamatum.*

Elevation – Approx. 3,000 to 3,200 ft **Slope –** 0% - 5%

Trapping conducted by: Chris Haley

Grid 13 First Term

	TIME	TEMP °F air	CAPTURES		Cloud Cover(%)		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/11/2011	0800	50	1	0	60	70	1	4
	1400	69						
4/12/2011	0830	51	2	0	5	1	9	8
	1330	67						
4/13/2011	1100	47	1	0	30	30	25	27
	1230	50						
4/14/2011	0900	50	0	0	1	35	1	4
	1400	66						
4/15/2011	0830	51	1	0	15	15	10	13
	1500	73						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 14
First Sampling Term

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover (%)		Wind speed (Mi/hr)	
			AGS*	MGS*	AM	PM	AM	PM
3/30/2011	0800	50	8	0	30	60	4	7
	1500	88						
3/31/2011	0715	52	9	0	5	5	5	3
	1500	83						
4/1/2011	0715	54	11	0	CLEAR	CLEAR	1	6
	1500	87						
4/2/2011	0700	52	6	0	60	40	7	10
	1430	77						
4/3/2011	0645	49	7	0	65	10	12	10
	1100	61						

Grid 15
First Sampling Term

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover(%1		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/4/2011	0900	53	10	0	CLEAR	5	2	3
	1400	70						
4/5/2011	0800	51	19	0	20	25	1	8
	1500	75						
4/6/2011	0830	51	16	0	50	35	4	9
	1500	66						
4/7/2011	1000	49	1	0	25	90	5	6
	1230	50						
4/8/2011	1130	47	0	0	30	80	6	10
	1545	54						

Grid 16
First Sampling Term

	TIME	TEMP °F air			Cloud Cover(%)		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/26/2011	0930	50	6	0	50	2	13	10
	1500	69						
4/27/2011	0700	51	22	0	2	15	4	10
	1500	77						
4/28/2011	0630	52	22	0	30	20	13	8
	1500	68						
4/29/2011	1045	50	9	0	0	0	28	13
	1400	66						
4/30/2011	0930	49	9	0	0	0	14	10
	1500	68						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 17
First Sampling Term

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover (%)		Wind speed (Mi/hr)	
			AGS*	MGS*	AM	PM	AM	PM
4/21/2011	0645	50	8	0	40	40	20	14
	1400	70						
4/22/2011	0715	49	13	0	5	15	20	10
	1200	73						
4/23/2011	0700	50	11	0	20	20	10	10
	1500	67						
4/24/2011	0730	50	9	0	30	50	10	12
	1300	68						
4/25/2011	0730	50	11	0	70	50	10	8
	1400	71						

Grid 18
First Sampling Term

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover(%)		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/23/2011	0700	50	1	0	20	20	10	10
	1500	67						
4/24/2011	0730	50	2	0	30	50	10	12
	1300	68						
4/25/2011	0730	50	3	0	70	50	10	8
	1400	71						
4/26/2011	0930	50	5	0	50	2	13	10
	1500	63						
4/27/2011	0700	51	6	0	2	15	4	10
	1500	77						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 19

Visual Surveys were conducted by: Barbara M. Leitner

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS – *Erodium cicutarium, Amsinckia tessellata, Schismus sp., Bromus tectorum, Bromus madritensis*

DOMINANT PERENNIALS- *Larrea tridentata*

OTHER PERENNIALS- *Hymenoclea salsola, Acamptopappus sphaerocephalus*, a few *Lycium* spp., *Ephedra californica*

Elevation – Approx. 3,360 ft **Slope – 0=2** %

Trapping conducted by: Barbara M. Leitner

Grid 19
First Sampling Term

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS*	MGS*	AM	PM	AM	PM
3/21/2011	1000	42	1	0	15 %	35%	0-8	10-15
	1812	48						
3/22/2011	0840	44	7	0	3%	5%	4-6	2-4
	1832	56						
3/23/2011	0650	48	9	0	35%	100%	0-1	0-2
	1630	67						
3/24/2011	0745	40	3	0	5%	85%	0-1	5-8
	1844	53						
3/25/2011	0710	46	2	0	10%	10%	2	11
	1815	55						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 20

Visual Surveys were conducted by: Barbara M. Leitner

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS – *Erodium cicutarium, Amsinckia tessellata, Schismus sp., Bromus tectorum, Bromus madritensis*

DOMINANT PERENNIALS- *Larrea tridentata*

OTHER PERENNIALS-Diverse assemblage of *Lycium cooperi, L. andersonii, Yucca brevifolia, Krascheninnikovia lanata, Acamptopappus sphaerocephalus, Senecio species.*

Elevation – Approx. 3,450 ft **Slope – 0-2** %

Trapping conducted by: Barbara M. Leitner

Grid 20
First Sampling Term

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS*	MGS*	AM	PM	AM	PM
3/27/2011	0815	45	2	0	5 %	2%	0-5	5-8
	1900	56						
3/28/2011	0655	45	3	0	3%	3%	5-12	7-8
	1900	60						
3/29/2011	0700	46	4	0	20%	30%	0-5	10
	1900	66						
3/30/2011	0700	51	7	0	30%	30%	0-1	0-1
	1845	82						
3/31/2011	0640	62	14	0	CLEAR	1%	0-1	0-1
	1800	80						

Other species captured: California ground squirrel (5)

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*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grids 21-24

Visual Surveys were conducted by: William Vanherweg

Results of Visual Survey: No MGS were observed

DOMINANT ANNUALS *–Bromus tectorum, Bromus madritensis., Erodium cicutarium, Amsinkia sp.*

DOMINANT PERENNIALS-*, Larrea tridentata Yucca brevifolia, Ephedra trifurca, Eriogonum fasciculatum, Ericameria sp.,* Achnatherum sp., *Poa sp*., *Hymenoclea salsola,*

OTHER PERENNIALS- Juniperus californicus, *Tetradymia spinosa, Encelia farinosa, Grayia spinosa, Krascheninnikovia lanata, Lycium andersonii, Yucca sp., Opuntia sp., Lepidospartum squamatum,.*

Elevation – Approx. 3,200 to 3,300 ft **Slope –** 0% - 5%

Trapping conducted by: William and Paul Vanherweg

Grid 21 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
3/20/2011	0700	40	3	0	20%	20%	0-5	5-10
	1600	62						
3/21/2011	0700	41	7	0	30%	5%	0-5	0-5
	1700	61						
4/22/2011	0700	46	3	0	80%	100%	0-5	5-10
	1500	53						
4/23/2011	0800	40	3	0	50%	80%	5-10	10-15
	1530	53						
4/24/2011	0700	43	5	0	20%	20%	10-15	10-15
	1500	54						

Grid 22 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/10/2011	0700	47	5	0	0%	0%	0-5	0-5
	1600	66						
4/11/2011	0700	48	9	0	100%	90%	0-5	10-15
	1700	66						
4/12/2011	0700	50	7	0	5%	0%	10-15	0-5
	1500	60						
4/13/2011	0800	48	6	0	5%	15%	0-5	25-30
	1530	58						
4/14/2011	0700	45	6	0	0%	80%	0-5	10-15
	1500	66						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 23 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/5/2011	0700	58	8	0	0%	0%	0-5	5-10
	1500	77						
4/6/2011	0700	52	2	0	80%	0%	5-10	5-10
	1530	69						
4/7/2011	0700	43	3	0	0%	100%	10-15	15-20
	1400	53						
4/8/2011	0830	40	1	0	0%	100%	5-10	5-10
	1200	45						
4/9/2011	0830	40	2	0	0%	10%	0-5	15-20
	1500	52						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel

Grid 24 First session

DATE	TIME	TEMP °F air	CAPTURES		Cloud Cover		Wind speed (Mi/hr)	
			AGS	MGS	AM	PM	AM	PM
4/10/2011	0700	47	12	0	0%	0%	0-5	0-5
	1600	66	1 cags					
4/11/2011	0700	48	13	0	100%	90%	0-5	10-15
	1700	66	1cags					
4/12/2011	0700	50	14	0	5%	0%	10-15	0-5
	1500	60	1 cags					
4/13/2011	0800	48	5	0	5%	15%	0-5	25-30
	1530	58	1cags					
4/14/2011	0700	45	6	0	0%	80%	0-5	10-15
	1500	66						

*AGS=antelope ground squirrel, MGS=Mohave ground squirrel, cags= California ground squirrel