Lockheed Martin Corporation

2008 Annual Monitoring Report for Incidental Take Permit (TE 110582-0) and Low-Effect Habitat Conservation Plan for the Federally-Endangered Stephens' Kangaroo Rat (SKR) Beaumont Sites 1 (Potrero Creek) and 2 (Laborde Canyon) Riverside County, California

January 2009

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February 4, 2009

Mark Pavelka
Carlsbad Fish and Wildlife Office
Department of the Interior
6010 Hidden Valley Road
Carlsbad, CA 92011

Subject: Submittal of the *2008 Annual Monitoring Report for the Incidental Take Permit (TE110582-0) and Low-Effect Habitat Conservation Plan for the Federally-Endangered Stephens' Kangaroo Rat on Beaumont Potrero Creek and Beaumont Laborde Canyon Properties, Riverside County, California*

Dear Mr. Pavelka:

Enclosed is the 2008 Annual Monitoring Report for the Incidental Take Permit (ITP) TE110582-0 issued to Lockheed Martin Corporation (LMC) for Potrero Creek (Site 1) and Laborde Canyon (Site 2) located in the City of Beaumont, Riverside County, California. The ITP and associated Low-Effect Habitat Conservation Plan (LE HCP) were completed under Section 10(a)(1)(B) of the federal Endangered Species Act. This Annual Report meets the requirements of Section 3.4 of the LE HCP.

The ITP was issued on October 14, 2005 and the Consistency Determination was issued on November 18, 2005. This report documents activities conducted under the permit between January 1, 2008 and December 31, 2008. Since the duration of the permit is five (5) years from the date of issuance, the permit is valid until October 14, 2010. As described in the report, there was a single take of a Stephen's Kangaroo Rat, but no violations of the permit occurred during the reporting period.

If you have any questions regarding this report, please contact me at 408.756.9595 or denise.kato@lmco.com.

Sincerely,

Denise Kato
Remediation Analyst Senior Staff

Enclosure

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BUR031 Beaumont 2008 Biological Survey Report Submittal

2007 Annual Monitoring Report for the Incidental Take Permit (TE110582-0) and Low-Effect Habitat Conservation Plan for the Federally-Endangered Stephens' Kangaroo Rat on Beaumont Potrero Creek and Beaumont Laborde Canyon Properties, Riverside County, California

January 2009
TC #: 23521-0405

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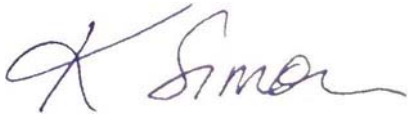
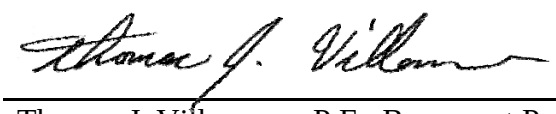


Kathy Simon, Principal Biologist, Tetra Tech, Inc.



Thomas J. Villeneuve, P.E., Beaumont Program Manager, Tetra Tech, Inc.

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1.0 INTRODUCTION

This 2008 Annual Monitoring Report corresponds to Incidental Take Permit (ITP) TE110582-0 issued to Lockheed Martin Corporation (LMC) for Potrero Creek (Site 1) located in the City of Beaumont, Riverside County, California and Laborde Canyon (Site 2) located in an unincorporated area of Riverside County, California and associated Low-Effect Habitat Conservation Plan (LE HCP) completed under Section 10(a)(1)(B) of the federal Endangered Species Act. This report meets the requirements of Section 3.4 of the LE HCP. The ITP was issued on October 14, 2005 and the Consistency Determination was issued on November 18, 2005. This report includes activities conducted under these permits between January 1, 2008 and December 31, 2008. Since the duration of the permit is five (5) years from the date of issuance, the permit is valid until October 14, 2010.

LMC is conducting hazardous waste investigations on Sites 1 and 2 (Areas of Operations shown on Figures 1 and 2), known to be occupied by the federally endangered Stephens' kangaroo rat (*Dipodomys stephensi*; SKR). These actions are in response to a consent order (No. 88/89-034) issued by the California Department of Toxic Substances Control (DTSC) to characterize the presence of contamination in groundwater and soils at Sites 1 and 2. LMC sought an ITP for SKR for direct take (by injury or death) and take of habitat that may occur in the course of otherwise lawful activities associated with the contaminants investigations, even with the successful implementation of the minimization and mitigation section of the LE HCP.

The LE HCP specifies that Annual Monitoring Reports will be submitted to USFWS and CDFG each year for the duration of the permit. This 2008 Annual Monitoring Report documents the following:

- Contaminant characterization activities conducted during 2008,
- 2008 incidental take and exclusion trapping of SKR at the Sites,
- Measurements of permanent and temporary effects to SKR habitat from LMC activities at the Sites,
- Ongoing results and updates of the SKR mapping program for the Sites, and
- Compliance with the avoidance, minimization, and mitigation activities covered by this five-year permit.

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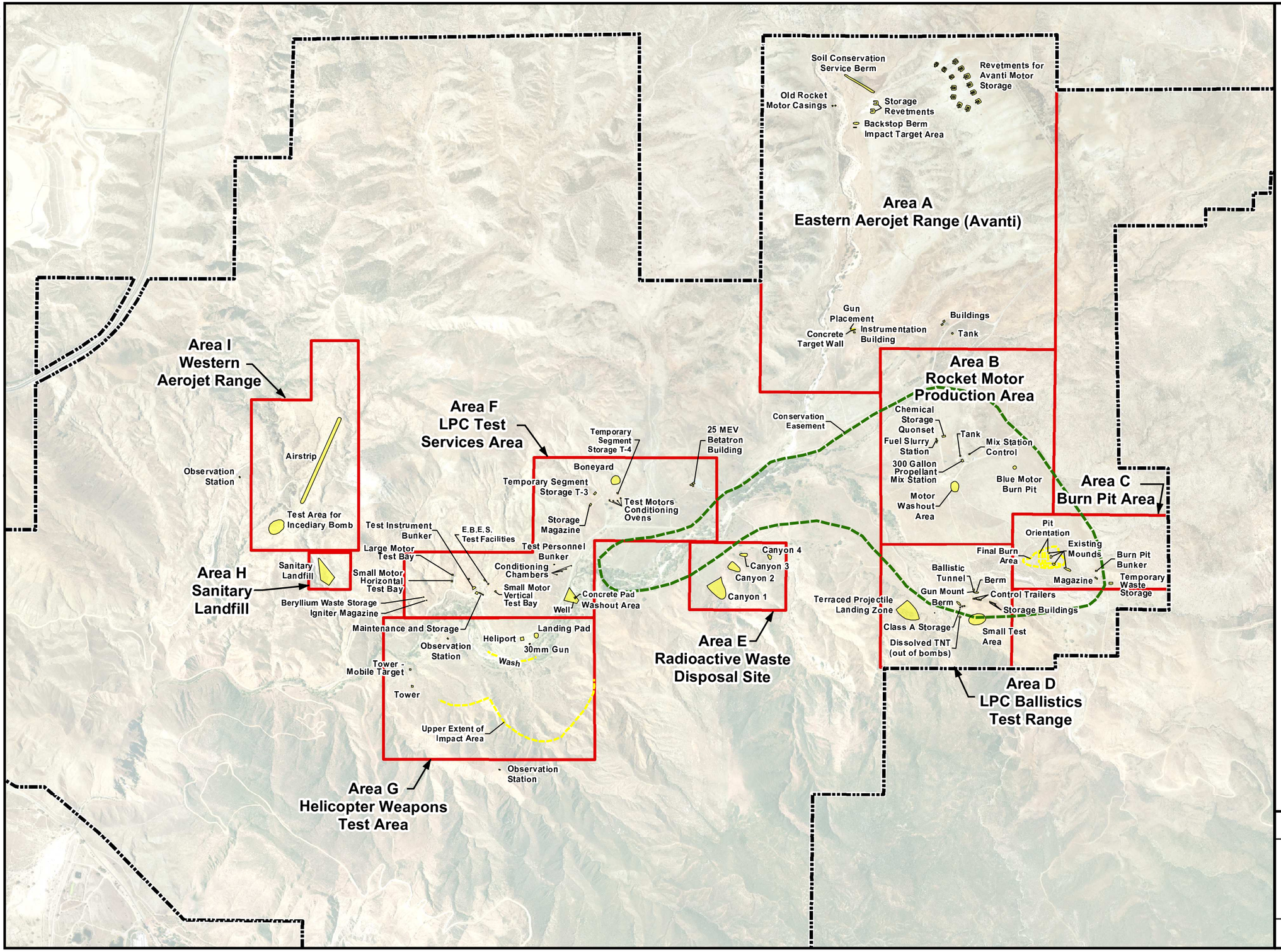

0 1,000 2,000 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary
- Conservation Easement

Notes: Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 1
Historical Operational Areas, Site Features, and Conservation Easement

TETRA TECH

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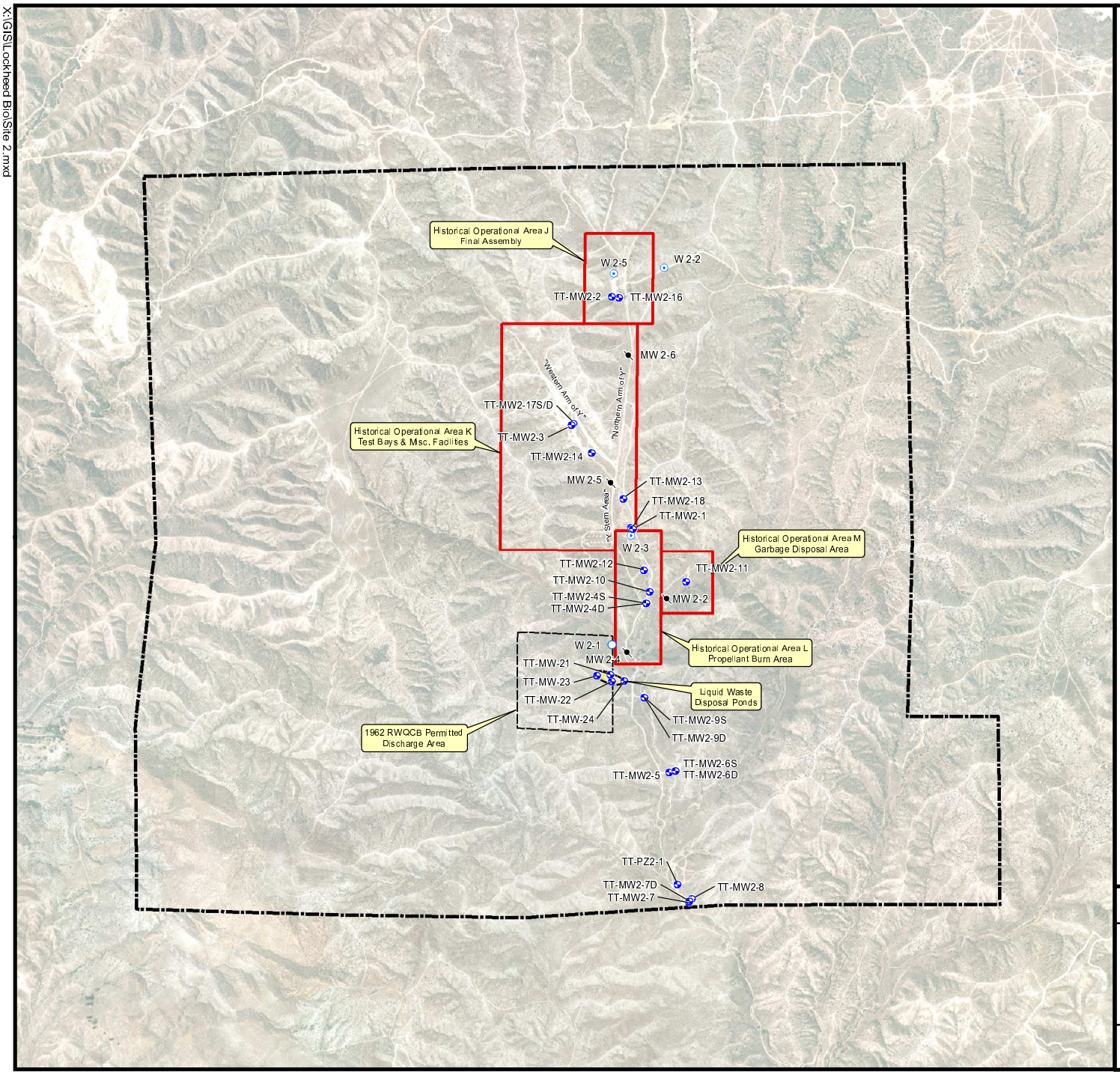


0 1,000 2,000 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Groundwater Monitoring Well Location
- Inactive Production Well Location
- Reported Production Well Location
- Destroyed Monitoring Well Location
- Beaumont Site 2 Property Boundary
- Historical Operational Area Boundary
- RWQCB Permitted Discharge Area

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

Figure 2
Site Map

TETRA TECH

2.0 BIOLOGICAL MONITORING

2.1 INVESTIGATION ACTIVITIES

Between January 1, 2008 and December 31, 2008, soil and groundwater investigation activities were performed at the two Sites. Table 1 summarizes the activities monitored at Site 1, and Table 2 summarizes the activities monitored at Site 2. These tables include the investigation activity, the corresponding activity number listed in the LE HCP (page 7 and 8), the dates the activity took place, and the agency-approved biological monitor supervising the activity.

2.2 OTHER ACTIVITIES AND EVENTS AFFECTING THIS PERMIT IN 2008

Security guards were placed on or near idle large drilling equipment due to previous thefts and vandalism on both sites. All guards completed the formal environmental training program established for LMC personnel on the site and when vehicles were onsite during active SKR hours they drove under a 10 MPH limit to avoid road kills.

High winds prevented work at Sites 1 and 2 at 13:00 hours on October 13 and 14. Wind gusts in excess of 30 mph created unsuitable safety conditions for all activities during this period. On October 24, work shut down on both sites due to reports of a fire south of Site. November 26 and December 15 had a lot of rain which caused slippery unsafe muddy conditions on both sites, no work was done these days.

Table 1
Activities at the Potrero Site (1) During 2008

Activity	Activity # in the LE HCP	Dates	Biological Monitor
Quarterly Well Monitoring	1	11/14	Anthony Mann
		11/21	Brad Haley
Well Installation and Development	2	2/8, 2/11, 9/4 7/14, 7/21-7/22, 7/24, 9/4-9/4, 9/8-9/12, 9/15-9/19, 9/22-9/26, 10/3, 10/6, 10/8-10/9, 10/16-10/17, 10/22-10/24, 10/27-10/31, 11/3, 11/21, 11/24-11/26, 12/2, 12/5, 12/9-12/10, 12/12-12/19, 12/21-12/23	Brad Haley
		2/13, 7/23, 7/28	Danica Schaffer-Smith
		7/16-7/17, 7/29, 9/17, 10/2, 11/3-11/4, 11/17, 12/1	Freddie Olmos
		7/21, 8/5	Scott Taylor
		9/8-9/10, 11/12-11/14, 11/18, 12/16	Anthony Mann
		9/8	Kent Hughes
		9/11	Kerry Myers
		9/15-9/16	Christine Tischer
		9/23, 11/19, 12/15	Kristen Mobraaten
		10/23, 11/6-11/7, 11/10-11/11, 12/1-12/3, 12/8-12/11, 12/18	Alfredo Aguirre
Routine Maintenance	4	1/24	Brad Haley
Road Maintenance	5	9/3, 10/27-10/31	Brad Haley
Mowing	10	8/20, 8/25, 8/27, 9/2-9/3, 10/9	Brad Haley
Survey Locations/Boundaries	11	8/20, 8/25, 8/27, 9/2-9/3, 9/5, 9/9, 9/11-9/12	Brad Haley
		8/26, 9/2	Danica Schaffer-Smith
		9/2	Anthony Mann
		9/11	Kerry Myers

Table 2
Activities at Laborde Canyon (Site 2) During 2008

Activity	Activity # in the LE HCP	Dates	Biological Monitor
Well Installation and Development	2	2/13	Danica Schaffer-Smith
		4/17, 5/12, 9/4, 9/15-9/19, 9/22-9/26, 10/7-10/10, 10/13-10/17, 10/20-10/21, 10/23-10/24, 10/31, 11/10-11/12, 11/18, 12/1-12/2, 12/5, 12/8-12/9, 12/11, 12/13, 12/15, 12/17-12/18, 12/21, 12/29-12/30	Brad Haley
		5/5, 10/30, 11/20, 12/3, 12/11, 12/17-12/18, 12/31	Freddie Olmos
		9/15	Christine Tischer
		9/29, 10/3. 10/6, 10/9-10/10, 10/16, 12/20, 12/30	Anthony Mann
		10/23, 10/30, 11/4-11/5, 11/10-11/11, 11/13-11/14, 11/17, 11/21, 11/24-11/26, 12/1, 12/4, 12/9-12/10, 12/14-12/19, 12/21-12/23	Alfredo Aguirre
		12/31	Scott Taylor
Routine Maintenance	4	11/3	Brad Haley
		11/3	Alfredo Aguirre
Road Maintenance	5	4/15	Freddie Olmos
		4/16	Kristen Mobraaten
		9/4-9/5	Brad Haley
Mowing	10	9/4	Brad Haley
		10/13	Freddie Olmos

3.0 LE HCP COMPLIANCE DURING THE REPORTING PERIOD

3.1 INCIDENTAL TAKE

One of the objectives under the LE HCP was to avoid and minimize the potential for direct take (injury or death) of the SKR. The ITP allows for the take of 3 individuals and exclusion trapping of 20 individuals throughout the 5-year duration of the LE HCP.

A take of a single SKR occurred on November 7, 2008. It was found at Site 1 on a paved road used to access drilling activities at approximately 0900 hours. The on-site biological monitor was immediately notified. The rat was cold and had dull eyes suggesting that it had been dead for several hours. The onsite monitor immediately notified the lead biological monitor and Steve Montgomery (permitted SKR biologist for the project). The kangaroo rat was identified by Steve Montgomery as an SKR on the evening of November 7. Corrective actions were taken immediately to try and prevent further incidents at the Sites.

- Biological monitors at each Site called personnel together to inform crews of the incident and reinforce the rules that needed to be followed as outlined in the HCP for the project.
- Tetra tech contacted the company responsible for nighttime security and communicated that guards are not to patrol and to drive very slowly at night.
- Tetra tech informed MSHCP of Riverside County of the incident and stressed that their crews drive at slow speeds during the night.

A second incident occurred at Site 1 in the early morning of November 24, 2008. A Dulzura kangaroo rat (DKR) (Dipodomys simulans) was found in a work area by the project's lead biological monitor. Tetra tech was contacted immediately as well as Steve Montgomery, who later identified the animal as a DKR and not an SKR. Again, corrective actions were taken immediately following this incident.

- Tetra tech insisted to the security company that there must be no more nighttime shift changes or guards driving during nighttime hours. It was communicated that these measures applied to both Sites
- Security was concerned about the location of portable bathrooms on the sites, necessitating driving to those facilities. Tetra tech immediately ordered additional facilities placed on the sites in all areas such that no driving would be required to reach these facilities at night.

A third incident occurred at Site 2 in the early morning of December 5, 2008. A DKR was found by a Tetra tech geologist on a paved road. The project's lead biological monitor was immediately contacted. Steve Montgomery was informed as well and he identified the animal as a DKR and not a SKR. Security guard shift changes were still occurring at night without Tetra tech's approval or knowledge at the time of this third incident. The lead biological monitor and Tetra tech discussed what further measures could be taken to ensure no security personnel were moving at night. The following new procedures were decided upon:

- The biological monitor escorts the security guard to their location in the evening and record the mileage of the guard's vehicle and
- The biological monitor meets the security guard in the same location in the morning and records the mileage of the vehicle again at that time to ensure the guard is on site and the vehicle has not moved.

Table 3 shows the maximum limits of incidental take for the project and the cumulative take since the beginning of the permit.

Table 3
Cumulative Take

Type of Impact	LE HCP Incidental Take Maximum Allowed	Take During 2005	Take During 2006	Take During 2007	Take During 2008
Direct take	3	0	0	0	1
Exclusion trapping	20	0	0	1	0

3.2 PERMANENT AND TEMPORARY EFFECTS TO SKR HABITAT

One objective under the LE HCP is to leave untouched approximately 99.90% of the SKR habitat within plan area by limiting effects to less than 3 acres. The ITP allows for 0.267 acres to be permanently affected and approximately 2.40 acres temporarily affected over the 5-year duration of the LE HCP. The definition of temporary adverse effects was clarified in 2006 after further coordination between LMC, Stephen J. Montgomery, and USFWS (Appendix A).

3.2.1 Permanent Adverse Impacts

Permanent effects in 2008 resulted from the installation of wells and associated concrete monuments and guard posts. These effects were calculated as shown in Table 4.

Table 4
2008 Reporting Period Permanent Impact Calculations

Activity	#	Diameter of facility (in)	Surface area of each facility (sq ft)	Area of Impacts (sq ft)	Area of Impacts (acres)
Well casings	25	12	0.79	19.75	0.000453
Monuments	24	24	4	96	0.002204
Guard posts	48	4	0.09	4.32	0.000099
Total 2008 Permanent Impacts					0.002756

This 0.002756 acres of permanent habitat effects represents approximately 1.03% of the total area of permanent effects allowed under the LE HCP (0.267 acres). No other activities were conducted under the LE HCP during the reporting period that created permanent effects.

3.2.2 Temporary Adverse Impacts

Temporary adverse effects occurred in 2008 in areas where temporary soil compaction occurred from heavy equipment activity. These activities were test pits, road repair, and grading. These effects were calculated as shown in Table 5.

Table 5
2008 Reporting Period Temporary Adverse Impact Calculations

Activity	Load spreading measures used?	Area of Impacts (sq ft)	Area of Impacts (acres)
Road Maintenance	Yes	200.0	0.004591
Landfill Test Pits	Yes	238.0	0.005464
Soil Dumped	Yes	200.0	0.004591
Grading	Yes	1,000.0	0.022957
Total 2008 Temporary Impacts			**0.037603**

This 0.037603 acres of temporary effects represents approximately 1.57% of the total area of incidental take allowed under the LE HCP (2.4 acres). No other activities were conducted under the LE HCP during the reporting period that created temporary effects.

3.2.3 Cumulative Adverse Impacts

Permanent and temporary effects are considered cumulative over the 5-year duration of the LE HCP. The LE HCP was approved and activities were initiated in 2005. Table 6 presents a summary of the cumulative allowable effects under the LE HCP and the effects from 2008.

Table 6
Cumulative Impacts

Type of Impact	LE HCP Allowable Incidental Take (acres)	Impacts During 2005 (acres)	Impacts During 2006 (acres)	Impacts During 2007 (acres)	Impacts During 2008 (acres)	Remaining Allowable Acreage
Permanent	0.267	0.000052	0.00034	0.00284	0.002756	0.261012
Temporary	2.4	0.291619	0.00691	0.11157	0.037603	1.952298

3.2.4 Beneficial and Offsetting Effects

Beneficial and offsetting effects are those effects of LMC activities which provide either only beneficial effects to the SKR and its habitat at the sites, or have offsetting effects where the effects may be temporarily adverse to one aspect of SKR habitat, but beneficial to another.

Beneficial Effects

Because the SKR prefers areas of sparse grassland habitats with high percentages of bare soil, beneficial effects at the sites in 2008 resulted from the careful driving of light vehicles in dense grassland areas of the sites. This provided potential movement corridors for SKR in areas where they may not otherwise have had access. Mowing of vegetation along road edges and in other areas of dense grasslands at the sites also resulted in beneficial effects.

Offsetting Effects

Offsetting effects resulted in areas where heavier drill rigs were brought in for well construction in 2008. For a more detailed description of offsetting effects refer to the 2007 SKR Permit Report, which has a full description of those effects. A brief summary of those effects follows.

Heavier drill rigs, water trucks and increased disturbance of the drilling areas and access pathways would have at first a negative potential for the SKR because of soil compaction. This compaction would inhibit the ease for burrow digging in these areas. But this impact appears to be transient. The SKR thrives in disturbed areas because these areas allow it to move and forage easier instead of having to crawl through dense grassland vegetation. The vegetation disturbed by the machinery could encourage SKR activity in these areas in excess of what was present before these areas were disturbed. Overtime, the soil compacted by the heavy machinery would become easier to dig into since it would not be continually used and subject to natural weathering.

3.3 SKR IMPACT ASSESSMENT PROGRAM

3.3.1 Summary of Impact Assessment Program

The LE HCP required that the effect on the SKR from activities at Potrero and Laborde be assessed by mapping occupied habitat before and after the investigation activities to measure changes in SKR density. However, because of the relative coarseness of the habitat mapping methodologies and because drilling activities encompass such small areas there was concern habitat mapping would not effectively detect any changes in SKR presence. As a result, a more detailed statistically confident method of measuring the effect of characterization activities on SKR was developed in 2006 for this project to use burrow counts at standardized activity site plots and at associated (paired) control sites (Appendix B.) Periodic burrow

counts at both the standardized activity site plots and control plots will help determine the effect different characterization activities have on the SKR and their habitat.

This methodology used counts of active kangaroo rat burrows as an index of SKR abundance/activity. Burrow counts occurred approximately 1 week prior to each activity, and then at approximately 1-, 6- and 24- week intervals following the activity completion date. All burrow counts in 2008 were conducted by Brad Haley (ECORP); trained in the mapping methodology by Stephen J. Montgomery, a biologist permitted by the U.S. Fish and Wildlife Service (TE 945541-9) and California Department of Fish and Game (CDFG) to trap/handle SKR.

The effect assessment was divided into time periods based on the year when the investigation activity occurred, although, pre- or post-activity surveys may have been conducted in two different calendar years. In this annual report, results of mapping surveys for 2008 activities are ongoing and will also be more fully reported in subsequent annual reports.

3.3.2 Survey Results for 2008 Activities

Mapping Strategies

Mapping strategy #3 (25% minimum sampling of work areas when numerous small excavations will be clustered in a particular area) was primarily used for drilling activities between August and December 2008. Within each of the Operational Areas, the drilling boreholes were mostly clustered together, making this strategy more appropriate than the others. Using this method (1 plot per 4 boreholes) also made the end of activity day easier to determine since most times the clustered drilling areas were not drilled within the same week.

Excavation in the landfill in July 2008 required that a new mapping strategy be developed (see mapping strategy #5 in Appendix B). Multiple areas throughout the landfill were identified as locations for characterizing the underground extent of the trash in July 2008. Because these sites were spread throughout the landfill, all of the burrows within the landfill were mapped.

Results

Pre-activity, 1-week, and 6-week post-activity surveys (with the 6-month survey planned for 2009) were completed for 24 locations at Site 1 (Figure 3), and 20 locations at Site 2 (Figure 11). The following pages contain more detailed figures for mapping locations in the Operational Areas for both sites. Figures 4-10 and 12-14 each contain a graph that presents the data collected during each of the burrow surveys on the primary and secondary monitoring sites, conducted from August to December 2008.

Following each of those figures is a table of the results of each burrow count (Tables 7-17). Areas on tables left blank are post-activity surveys yet to be completed. The text located at the bottom of each table

suggests trends in the data and further explains what factors may have contributed to the data collected at the associated sites.

Discussion

Impact mapping surveys conducted from 2006 to 2008 preliminarily suggest no consistent patterns of positive or negative changes in SKR activity between the study sites and the control plots at either site. Further analysis of the relationship between SKR activity and substrate/vegetation disturbance will be conducted as more sites are developed and added to the effect assessment during future years of the mapping program. The assessment program will continue to be conducted and re-evaluated at least annually to assess the program's effectiveness at meeting its goals and to make minor adjustments to adapt to changing conditions or unanticipated circumstances.

Data recorded for the August to December 2008 activities will be completely collected by mid-2009 (all 6-month post-activity surveys complete). Once this data has been collected, it will be possible to run additional statistical analyses to assist in determining the effects of these activities on the SKR population.

For the plots that have been surveyed through the 6-week post-activity date, a majority of the plots (both the primary and the control) have the same or more burrows than they did when the pre-activity survey was completed. The effects of herbaceous vegetation mowing, and/or light vehicle use and drilling activities, may have played a role in expanding the range of SKR at Sites 1 and 2. These activities temporarily eliminated vegetation cover resulting in new areas with the type of reduced ground cover preferred by SKR.

The geography of Site 2 (creeks/drainages, roads, and narrow canyons with steep hills) limited the placement and number of monitoring plots created from August to December 2008.

There are dozens of environmental factors that can influence the presence and number of active kangaroo rat burrows. This impact assessment program aims simply to determine if LMC activities involving heavy equipment or vegetation removal affects the population of SKR at either site. It is impossible to make all of those environmental factors a constant, and have heavy equipment as the only variable. The results of the 2008 mapping program proved that factors other than heavy equipment, can influence the amount of kangaroo rat burrows present in an area. There were periods of heavy rain and high wind, each of which caused substrate erosion. Depending on the day of the post-activity survey (or pre-activity survey for that matter), the amount of burrows that appear active to the surveyor may have been affected. Burrows may have been filled in with water or soil, and fresh scat may have been blown away from the entrance of the burrows. Recently (December 2008), following heavy rain events, thick grass has filled in areas of bare soil where heavy equipment previously was operating. The dense grasslands are not preferred by kangaroo rats.

X:\GIS\Lockheed 22288-040\1\SKR Grids All R1.mxd

501500 502000 502500 503000 503500 504000 504500 505000 505500 506000 506500 507000

3749500 3749000 3748500 3748000 3747500 3747000 3746500 3746000 3745500

Area A
Eastern Aerojet Range (Avanti)

Area I
Western Aerojet Range

Area F
LPC Test Services Area

Area B
Rocket Motor Production Area

Area H
Sanitary Landfill

Area E
Radioactive Waste
Disposal Site

Area D
LPC Ballistics Test Range

Area C
Burn Pit Area

Area G
Helicopter Weapons Test Area

N

0 750 1,500 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary SKR Monitoring Grid Location
- Secondary SKR Monitoring Grid Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary
- Conservation Easement Boundary

Notes: Beaumont Site 1 property boundary is approximate.

Coordinates in UTM, Zone 11N, NAD83.

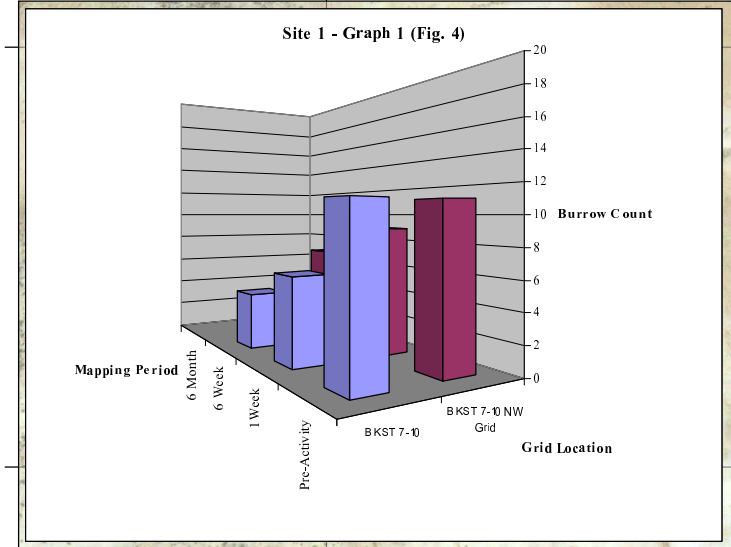
Beaumont Site 1

Figure 3

SKR Monitoring Grid Locations

TETRA TECH

X:\GIS\Lockheed 22288-04011\SKR Grids Area A.mxd



505800 506000 506200

3749800 3749600 3749400 3749200

BKST 7-10 Northwest Grid

BKST 7-10

0 150 300 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location

Note: Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 1

Figure 4
Area A
Eastern Aerojet Range
SKR Monitoring Grid Locations

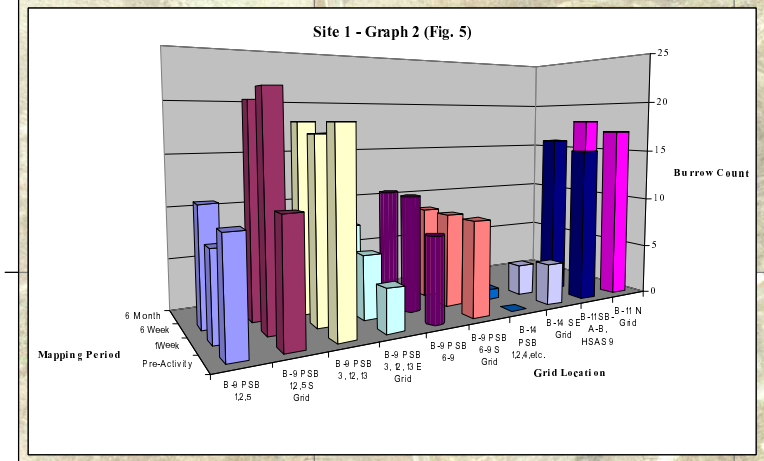
TETRA TECH

Table 7
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 1, Area A

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
BKST 7-10 Primary	11	6	4		9/8/08	9/17/08	10/22/08	
BKST 7-10 NW Grid	11	9	7					

The numbers of active burrows decreased for both the primary grid and the control grid. All burrows located within the primary grid were covered during drilling activities and did not appear to be affected by the equipment after drilling equipment left the grid.

X:\GIS\Lockheed 22288-04011\SKR Grids Area B.mxd



505800 506000 506200

3747200 3747000 3746800

B-14 PSB 1,2,4,5,6,SSB-B; B-20 PSB 6

B-14 PSB 1,2,4,5,6,SSB-B; B-20 PSB 6 Southeast Grid

B-9 PSB 3, 12, 13

B-9 PSB 3, 12, 13 East Grid

B-9 PSB 6-9

B-9 PSB 1, 2, 5

B-9 PSB 6-9 South Grid

B-11 SB-A, SB-B, HSAS 9 North Grid

B-9 PSB 1, 2, 5 South Grid

B-11 SB-A, SB-B, HSAS 9

Area B
Rocket Motor Production Area

N

0 150 300
Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Historical Operational Area Boundary

Note: Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 1

Figure 5
Area B
Rocket Motor Production Area
SKR Monitoring Grid Locations

TETRA TECH

Table 8
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 1, Area B

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
B-9 PSB 1,2,5 Primary	10	8	11		9/23/08	10/1/08	10/31/08	
B-9 PSB 1,2,5 S Grid	11	21	20					
B-9 PSB 3, 12, 13 Primary	18	17	18		9/22/08	10/1/08	11/3/08	
B-9 PSB 3, 12, 13 E Grid	4	6	8					
B-9 PSB 6-9 Primary	8	11	11		9/23/08	10/1/08	11/3/08	
B-9 PSB 6-9 S Grid	9	9	9					
B-11 SB-A, SB-B, HSAS 9	15	16			12/12/08	12/21/08		
B-11 SB-A, SB-B, HSAS 9 N Grid	17	18						
B-14 PSB 1,2,4,5,6,SSB-B; B-20 PSB 6 Primary	0	1			11/12/08	1/16/09		
B-14 PSB 1,2,4,5,6,SSB-B; B-20 PSB 6 SE Grid	4	3						

The primary grids and associated control grids that have been monitored up to the 6 week period either showed no change or an increase in active burrows. The B-11 and B-14 primary grids each showed an increase of one burrow just one week after the drilling activities were completed. Note the B-14 control grid decreased by one burrow due to natural reasons.

X:\GIS\Lockheed 22288-04011SKR Grids Area C.mxd

506200 506400 506600 506800 507000 507200 507400

3746800 3746600 3746400 3746200 3746000 3745800

B-11 SB-A SB-B HSAS 9 North Grid

B-11 SB-A SB-B HSAS 9

C-22 PSB 1-3 Northeast Grid

C-22 PSB 1-3

C-22 PSB 4-6 East Grid

C-22 PSB 4-6

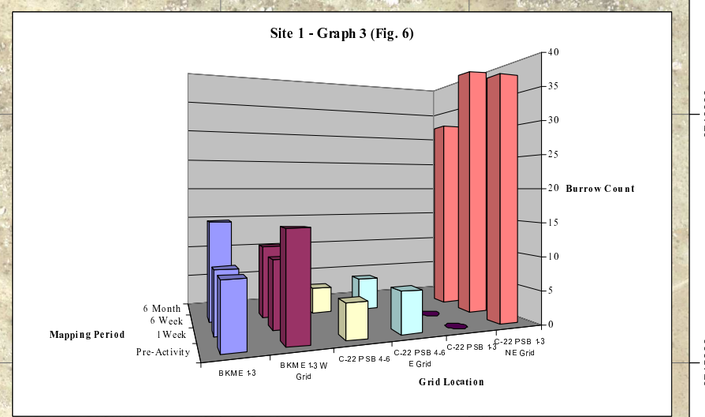
BKME 1-3

BKME 1-3 West Grid

Area B
Rocket Motor
Production Area

Area C
Burn Pit Area

Area D
LPC Ballistics Test Range



N

0 200 400 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary
- Conservation Easement Boundary

Notes: Beaumont Site 1 property boundary is approximate.

Coordinates in UTM, Zone 11N, NAD83.

Beaumont Site 1

Figure 6
Area C
Burn Pit Area
SKR Monitoring Grid Locations

TETRA TECH

Table 9
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 1, Area C

Drilling Borehole Name(s)	# Active Burrows				Survey Dates			
	Pre-Activity	1 Week	6 Week	6 Month	Pre-Activity	1 Week	6 Week	6 Month
BKME 1-3 Primary	9	9	15		9/10/08	9/17/08	10/23/08	
BKME 1-3 W Grid	15	10	11					
C-22 PSB 1-3 Primary	0	0	0		11/3/08	11/14/08	12/13/08	
C-22 PSB 1-3 NE Grid	37	39	31					
C-22 PSB 4-6 Primary	5	**	4		9/19/08	**	11/3/08	
C-22 PSB 4-6 E Grid	6	**	5					

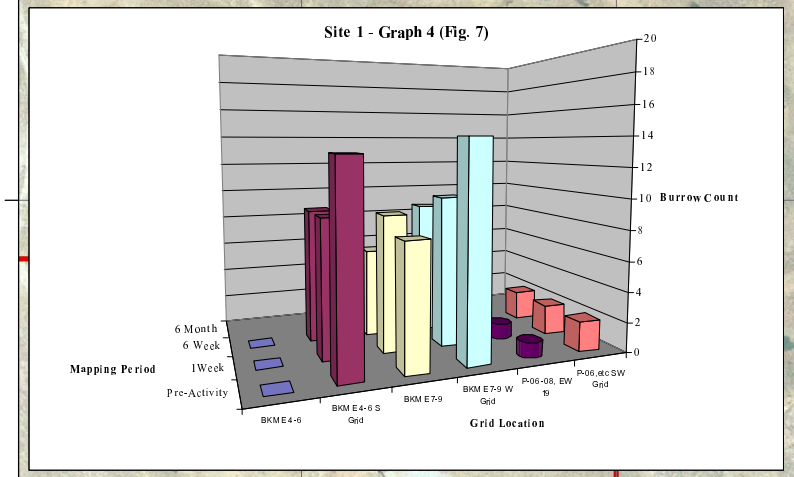
Notes: **This date was missed because of pending MEC investigation

BKME 1-3 primary grid showed an increase in four active burrows six weeks after the activities were completed, where its associated control plot lost four burrows within the same time period and was not affected by any activities associated with this Incidental Take Permit.

While several active kangaroo rat burrows are within 10 feet of the C-22 1-3 primary grid, no burrows formed six weeks after the activities were completed within the grid. Half of the grid is within mowed, dense buckwheat scrub habitat. This grid's associated control plot gained two active burrows one week after activities were completed, then lost eight burrows six weeks after activities were completed. Note that between the one week and six week mapping periods, the Riverside County Multiple Species Habitat Conservation Plan (MSHCP) crews had several nights of trapping for SKR within and around the control grid. While this should not impact the amount of burrows present, it is just another factor, in addition to natural events, that can cause burrow counts to decrease, not the activities associated with this Incidental Take Permit.

The C-22 4-6 grids have incomplete data because of a pending Munitions and Explosives of Concern (MEC) investigation in that area of the grid. No personnel were allowed with the area until the investigation was complete. Once the investigations were complete, the six week mapping period was conducted, and revealed that both the primary and control grids lost one burrow.

X:\GIS\Lockheed 22288-04013\SKR Grids Mid_Potrero.mxd



504200 504400 504600 504800

3747200 3747000 3746800 3746600

BKME 7-9 West Grid

BKME 7-9

Area F
LPC Test
Services
Area

BKME 4-6

BKME 4-6 South Grid

P 06-08, EW 19

Area E
Radioactive Waste
Disposal Site

P 06-08, EW 19 Southwest Grid

0 200 400 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Historical Operational Area Boundary
- Conservation Easement Boundary

Note: Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 1

Figure 7

Middle Potrero Creek SKR Monitoring Grid Locations

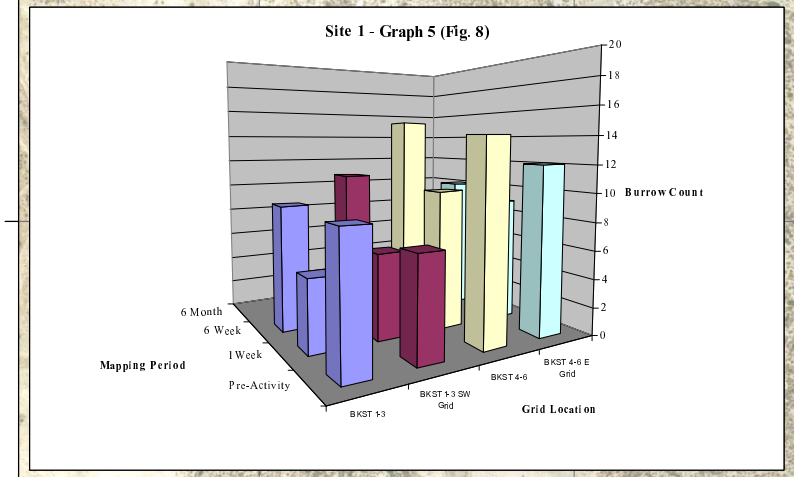
TETRA TECH

Table 10
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 1, Middle Potrero Creek

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
BKME 4-6 Primary	0	0	0		9/11/08	9/18/08	10/27/08	
BKME 4-6 S Grid	13	9	9					
BKME 7-9 Primary	8	9	6		9/9/08	9/17/08	10/22/08	
BKME 7-9 W Grid	14	10	9					
P-06-08, EW 19 Primary	1	1	1		10/27/08	12/11/08	1/16/09	
P-06-08, EW 19 SW Grid	2	2	2					

The amount of active burrows observed through the six week mapping period at BKME 4-6 primary grid and both grids at P 06-08 remained the same as their pre-activity levels. The primary grid at BKME 7-9 lost two burrows, whereas its associated control grid lost five through six weeks of mapping. This is an example of how kangaroo rat burrow density can fluctuate naturally over time, without the influence of any outside factors. For the P-06-08 primary grid, the burrow mapper noted that two new burrows formed within 7 days of finishing drilling activities. These burrows were outside of the mapping grid, but were within the disturbance area where the drilling-related equipment was operating. Also noted were the dates that well drilling finished (11/18/08) and the date that all activities were completed with the grid (12/2/08).

X:\GIS\Lockheed 22288-04011\SKR Grids North.mxd



503400 503600 503800 504000

3748600 3748400 3748200 3748000

BKST 4-6

BKST 4-6 East Grid

BKST 1-3

BKST 1-3 Southwest Grid

0 200 400 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Beaumont Site 1 Property Boundary

Note: Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 1

Figure 8

Northern Property Area SKR Monitoring Grid Locations

TETRA TECH

Table 11
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 1, Northern Property Area

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
BKST 1-3 Primary	9	5	9		9/9/08	9/16/08	10/22/08	
BKST 1-3 SW Grid	7	6	11					
BKST 4-6 Primary	14	10	15		9/9/08	9/16/08	10/22/08	
BKST 4-6 E Grid	12	9	10					

The primary grids BKST 1-3 and 4-6 both lost four burrows one week after activities were completed, but the six week mapping period revealed that those grids recovered to the same level (BKST 1-3) or increased (BKST 4-6) in active burrows. The control plots also showed the same trend, with no activities affecting them.

X:\GIS\Lockheed 22288.040\SKR Grids Areas F-G.mxd

502200 502400 502600 502800 503000 503200 503400 503600

3746400 3746200 3746000 3745800 3745600

Area F
LPC Test Services Area

F-39 PSB 5.7.A.F.H.+1 unk

F-34 SSB 6.8.9.10

F-39 PSB 5.7.A.F.H.+1 unk Southwest Grid

F-34 SSB 6.8.9.10 Southeast Grid

PMW-83 Northwest Grid

PMW-82 North Grid

PMW-83

PMW-82

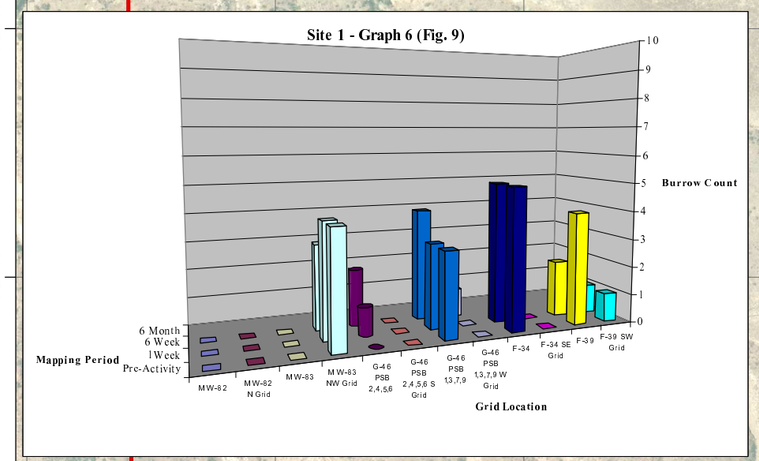
G-46 PSB 2, 4, 5, 6

G-46 PSB 1, 3, 7, 9

G-46 PSB 1, 3, 7, 9 West Grid

G-46 PSB 2, 4, 5, 6 South Grid

Area G
Helicopter Weapons Test Area



0 200 400 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Historical Operational Area Boundary
- Conservation Easement Boundary

Note: Coordinates in UTM, Zone 11N, NAD83.

Beaumont Site 1

Figure 9
LPC Test Services Area and Helicopter Weapons Test Area SKR Monitoring Grid Locations

TETRA TECH

Table 12
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 1, LPC Test Services Area and Helicopter Weapons Test Area

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
MW-82 -Primary	0	0	0		7/18/08	8/2/08	9/9/08	
MW-82 N Grid	0	0	0					
MW-83 Primary	0	0	0		7/18/08	8/2/08	9/9/08	
MW-83 NW Grid	4	4	3					
F-34 SSB 6,8,9,10 Primary	5	5			10/21/08	12/20/08		
F-34 SSB 6,8,9,10 SE Grid	0	0						
F-39 SSB 5,7,A,F,H,+1 unk Primary	4	2			10/6/08	12/13/08		
F-39 SSB 5,7,A,F,H,+1 unk SW Grid	1	1						
G-46 PSB 1,3,7,9 Primary	3	3	4		9/16/08	10/1/08	10/30/08	
G-46 PSB 1,3,7,9 W Grid	0	0	1					
G-46 PSB 2,4,5,6 Primary	0	1	2		9/16/08	10/1/08	10/30/08	
G-46 PSB 2,4,5,6 S Grid	0	0	0					

F-34, MW 82, and 83 grids showed no changes in active burrows through their most recent mapping period, except for one less burrow at the control grid for MW 83. Both G-46 primary grids showed an increase in the amount of active burrows. The primary grid for F-39 had two less active burrows than it did since the pre-activity mapping was completed. This decrease can be attributed to a heavy rain event, not drilling related activities. Boundaries were placed next to the burrows so that drilling-related equipment did not impact them. Also, those burrows were along a road where the water flowed when it rained. This provides an example of how the burrows can be affected by natural events.

X:\GIS\Lockheed 22228-04011\SKR Grids Areas H-I.mxd

501200 501400 501600 501800 502000 502200

3746800 3746600 3746400 3746200

Area I
Western Aerojet Range

BKME 10-12

BKME 10-12 West Grid

Area H
Sanitary Landfill

H-49 PSB 1A, 3, 4, SSB B,F East Grid

H-49 PSB 1-4

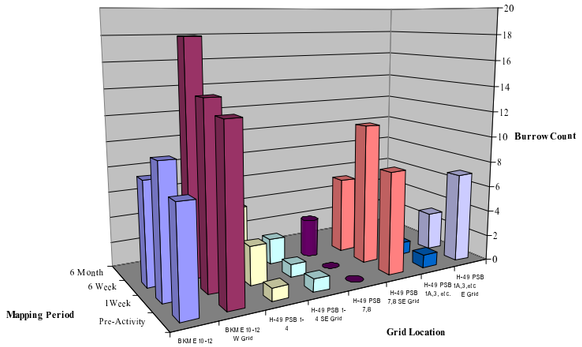
H-49 PSB 1A, 3, 4, SSB B,F

H-49 PSB 7-8

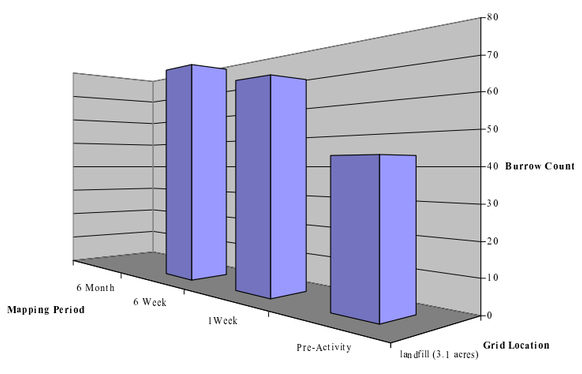
H-49 PSB 1-4 Southeast Grid

H-49 PSB 7-8 Southeast Grid

Site 1 - Graph 7 (Fig. 10)



Site 1 - Graph 8 (Fig. 10) landfill (3.1 acres)



0 150 300 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Former Landfill Boundary
- Historical Operational Area Boundary

Note:

Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 1

Figure 10
Area H
Sanitary Landfill
SKR Monitoring Grid Locations

TETRA TECH

Table 13
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 1, Area H

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
BKME 10-12 Primary	8	10	8		9/10/08	9/18/08	10/22/08	
BKME 10-12 W Grid	13	14	18					
H-49 PSB 1-4 Primary	1	3	5		9/8/08	9/26/08	10/30/08	
H-49 PSB 1-4 SE Grid	1	1	2					
H-49 PSB 7,8 Primary	0	0	3		9/18/08	9/26/08	10/30/08	
H-49 PSB 7,8 SE Grid	8	11	6					
H-49 PSB 1A, 3, 4 SSB B,F Primary	1	1			11/14/08	1/12/09		
H-49 PSB 1A, 3, 4 SSB B,F E Grid	7	3						

Primary grids BKME 10-12 and H-49 1A, 3, 4, SSB B, F had active burrow numbers remain the same after drilling activities were completed. The BKME primary grid increased by two burrows just after the activities ceased, but then dropped back down to pre-activity levels after the six week mapping period. Primary grids H-49 PSB 1-4 and 7-8 increased in active burrow numbers through the six week mapping period. Two of the control grids (BKME and 1-4) showed an increase in active burrows, while the 7-8 and 1A, 3, 4, etc. control grids lost active burrows naturally.

Table 14
2008 Pre-and Post-Activity SKR Schedule and Sign, Site 1, H-49 (Landfill)

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
landfill (3.1 acres)	43	68	76		7/11/08	8/8/08	8/27/08	

This mapping strategy (#5) was recently added to the SKR burrow mapping methodology. This strategy has no control grid. The amount of active burrows within the landfill increased dramatically during every mapping period. This was due to one primary reason: the activity completed at the landfill involved multiple subsurface soil investigations. This activity softened up the soil in multiple locations throughout the landfill, making it easier for kangaroo rats to create burrows. The activities listed in Table 13 occurred between the six week and six month mapping periods. The mapping schedule for the entire landfill will need to be adjusted to incorporate the ending date of those activities.

X:\GIS\Lockheed 22289-0301\Site 2 Grids.mxd

496500 497000 497500 498000

3752500 3752000 3751500 3751000 3750500 3750000

Former Parking Area
Area J
Former Final Assembly
Building 250
Rocket Assembly
Building
Transformer Pad
TT-MW2-2
TT-MW2-16
Water Tanks
and Pumphouse
Concrete Slabs
Concrete Mount
Centrifuge
Large Bunker
Test Bay No. 4
Parking Area
Concrete Pad
Historical Operational Area K
Test Bays & Misc. Facilities
Prism
Test Bay No. 1
TT-MW2-17S/D
TT-MW2-3
Test Bay No. 2
Concrete Vaults
Test Bay No. 3
TT-MW2-14
Small Bunker
Conditioning
Chambers
TT-MW2-13
TT-MW2-18
T-Revetment
Conditioning Chambers
TT-MW2-1
Previously Assessed
Dump Site
Concrete Pad
Instrument
Building
TT-MW2-12
Propellant
Burn Site
TT-MW2-11
TT-MW2-10
TT-MW2-4D
TT-MW2-4S
Historical Operational Area M
Garbage Disposal Area
Liquid Waste
Disposal Pond
Historical Operational Area L
Propellant Burn Area
TT-MW-21
TT-MW-23
TT-MW-24
TT-MW-22
TT-MW2-9D
TT-MW2-9S
TT-MW2-6S
TT-MW2-5
TT-MW2-6D
TT-PZ2-1
TT-MW2-8
TT-MW2-7
TT-MW2-7D

LEGEND

- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Monitoring Well Location
- Piezometer Well Location
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

N

0 350 700 Feet

Adapted from: March 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 2

Figure 11

SKR Monitoring Grid Locations

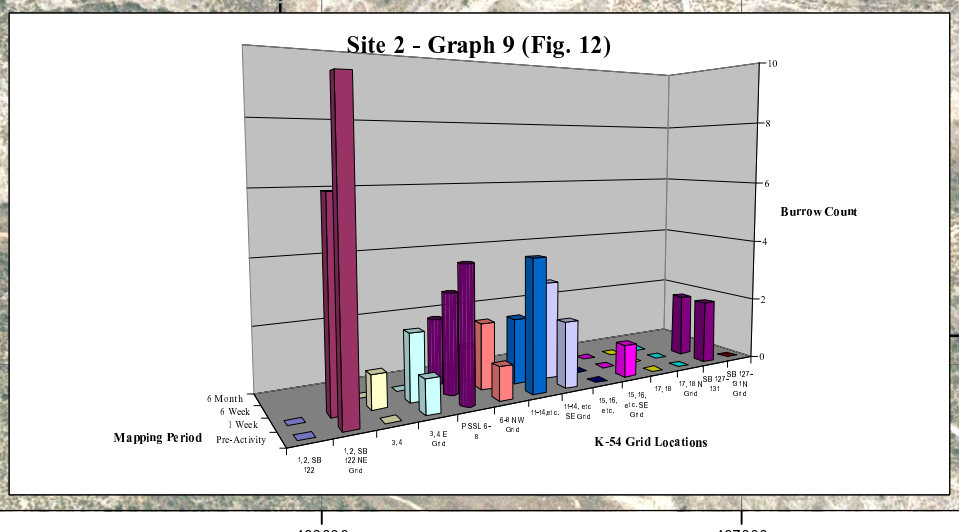
TETRA TECH

X:\GIS\Lockheed 22289-0301\Site 2 Grids Op K.mxd

496800 497000 497200 497400

3752400 3752200 3752000 3751800 3751600 3751400

Building 250 Rocket Assembly Building
TT-MW2-2
TT-MW2-16
Water Tanks and Pumphouse
K-54 PWL-1 Northwest Grid
Concrete Slabs
K-54 PWL-1
Concrete Mount
K-54 PSSL 1-2, SB-122 Northeast Grid
Centrifuge
K-54 PSSL 1-2, SB-122
K-54 PSSL 6-8 Northwest Grid
K-54 PSSL 3-4 East Grid
K-54 PSSL 3-4
Large Bunker
Test Bay No. 4
K-54 PSSL 6-8
K-54 SB 127-131 North Grid
Parking Area
Historical Operational Area K Test Bays & Misc. Facilities
Concrete Pad
Prism
K-54 PSSL 17-18 North Grid
Test Bay No. 1
K-54 SB 127-131
K-54 PSSL 11-14; SB 119
TT-MW2-17S/D
TT-MW2-3
Test Bay No. 2
K-54 PSSL 17-18
K-54 PSSL 11-14, SB 119 Southeast Grid
Concrete Vaults
K-54 PSSL 15-16; SB 120-121, 123-126
K-54 PWL-3 East Grid
Test Bay No. 3
K-54 PSSL 15-16, SB 120-121, 123-126 Southeast Grid
K-54 PWL-3
K-54 PWL-2 East Grid
K-54 PWL-2
TT-MW2-14
Small Bunker
K-54 PWL-4
Conditioning Chambers
TT-MW2-13
K-54 PWL-5 North Grid
K-54 PWL-4 South Grid
T-Revetment Conditioning Chambers
K-54 PWL-5
TT-MW2-18
TT-MW2-1
Concrete Pad
Instrument Building
Propellant Burn Site
L-56 PSSL 1-5
TT-MW2-12



LEGEND

- Monitoring Well Location
- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Historical Operational Area Boundary

0 150 300 Feet

Adapted from: March 2007 aerial photograph.

Note: Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 2

Figure 12

Area K
Test Bays and Miscellaneous Facilities
SKR Monitoring Grid Locations

TETRA TECH

Table 15
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 2, Area K

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
K-54 PWL 1 Primary	0				9/25/08			
K-54 PWL 1 NW Grid	2							
K-54 PWL 2 Primary	0				9/15/08			
K-54 PWL 2 E Grid	1							
K-54 PWL 3 Primary	0				11/14/08			
K-54 PWL 3 E Grid	0							
K-54 PWL 4 Primary	0				11/14/08			
K-54 PWL 4 S Grid	0							
K-54 PWL 5 Primary	0				11/10/08			
K-54 PWL 5 N Grid	6							
K-54 PSSL 1, 2, SB 122 Primary	0	0			9/25/08	11/3/08	12/9/08	
K-54 PSSL 1, 2, SB 122 NE Grid	9	6						
K-54 PSSL 3, 4 Primary	0	1	0		9/20/08	10/3/08	11/10/08	
K-54 PSSL 3, 4 E Grid	1	2	0					
K-54 PSSL 6-8 Primary	4	3	2		10/3/20088	10/8/08	11/10/08	
K-54 PSSL 6-8 NW Grid	1	2	1					
K-54 PSSL 11-14; SB 119 Primary	4	2			9/17/08	12/2/08		
K-54 PSSL 11-14; SB 119 SE Grid	2	3						
K-54 PSSL 15, 16; SB 120, 121, 123-126 Primary	0	0	0		9/17/08	11/3 + 12/11/08	1/16/09	
K-54 PSSL 15, 16; SB 120, 121, 123-126 SE Grid	1	0	0					
K-54 PSSL 17, 18 Primary	0	0	0		10/3/08	10/8/08	11/10/08	
K-54 PSSL 17, 18 N Grid	0	0	0					
K-54 SB 127-131 Primary	2	2			11/10/08	12/2/08		
K-54 SB 127-131 N Grid	0	0						

Graph 9 on Figure 12 does not include data from K-54 PWL 1-5 because not enough data had been collected yet. For the four sets of grid that had been mapped through the six week period, only the primary grid for 6-8 and the control grid for 3-4 showed a decrease in the amount of active

burrows, the others stayed the same. For the three sets of grids that were mapped through the one week mapping period, the control grid for 1-2 and primary grid for 11-14 showed a decrease in the amount of active burrows, the others stayed the same.

The burrow mapper had a miscommunication between the biological monitors and the geologists for grid 6-8 as far as the order of drilling activities. While the burrows were covered for the drilling activities associated within this grid, the grid was not mapped prior to the activity. The monitor for the drilling at 6-8 worked with the burrow mapper to determine the amount of active burrows located within the primary grid.

At many of the drilling locations, the wells were finished, however, not considered completed by the burrow mapper because the drillers left equipment and supplies at or within the mapping grids at the chance that another well would need to be installed near the same location. The activities labeled SB as the prefix were all wells or boreholes that were drilled after the original well was completed. Up to two weeks went by without any activity within a certain grid, but since drilling again was likely and drilling-related equipment remained within the grid, it was not considered completed.

While mapping strategy #3 states that a minimum of 25% of the area to be disturbed be mapped, that was not always possible. The geography of this site (narrow canyons, creeks/drainages, and roads) limited the placement and number of grids created.

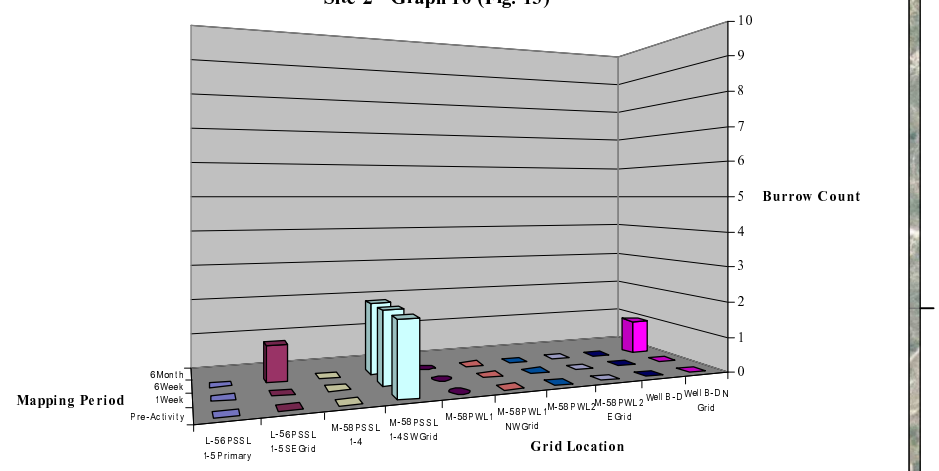
X:\GIS\Lockheed 22289-0301\Site 2 Grids Op L.mxd

497000 497200 497400 497600 497800

3751600 3751400 3751200 3751000 3750800 3750600

K-54 PWL-4
Conditioning Chambers
TT-MW2-13
K-54 PWL-5 North Grid
K-54 PWL-4 South Grid
K-54 PWL-5
TT-MW2-18
TT-MW2-1
T-Revetment Conditioning Chambers
Concrete Pad
Instrument Building
Propellant Burn Site
L-56 PSSL 1-5
TT-MW2-12
M-58 PSSL-1-4
Previously Assessed Dump Site
M-58 PWL-2 East Grid
M-58 PSSL-1-4 Southwest Grid
L-56 PWL 1,2 Northwest Grid
M-58 PWL-1 Northwest Grid
TT-MW2-11
M-58 PWL-2
L-56 PSSL 1-5 Southeast Grid
TT-MW2-10
L-56 PWL 1,2
TT-MW2-4D
TT-MW2-4S
M-58 PWL-1
Historical Operational Area M Garbage Disposal Area
Historical Operational Area L Propellant Burn Area
Liquid Waste Disposal Pond
TT-MW-21
Well A West Grid
Well B-D North Grid
TT-MW-23
TT-MW-22
Well A
TT-MW-24
TT-MW2-9D
TT-MW2-9S
Well B-D
TT-MW2-6S

Site 2 - Graph 10 (Fig. 13)



LEGEND

- Monitoring Well Location
- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Historical Operational Area Boundary

N

0 150 300 Feet

Adapted from: March 2007 aerial photograph.

Note: Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 2

Figure 13

Areas L and M
Propellant Burn Area and Landfill
SKR Monitoring Grid Locations

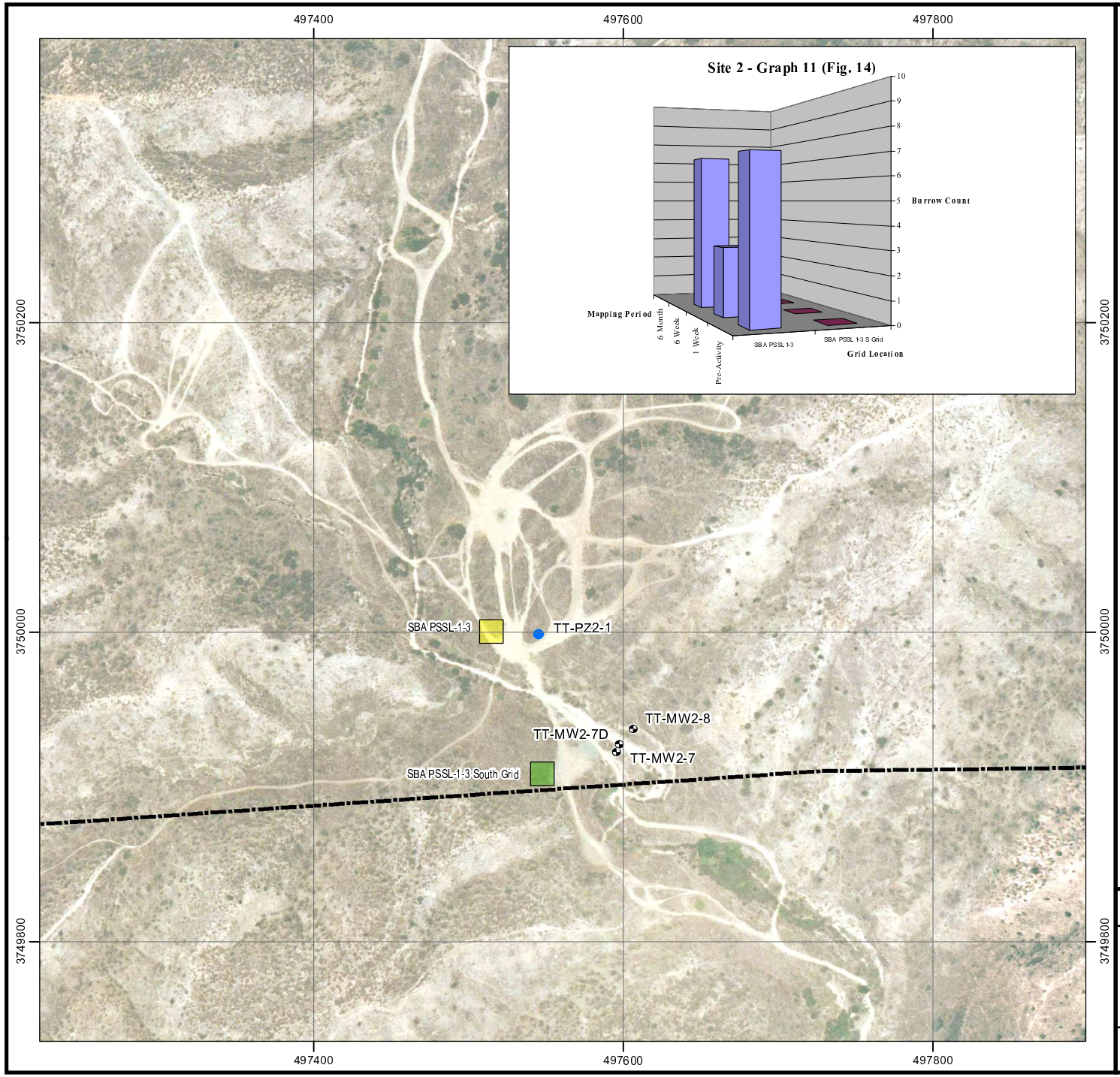
TETRA TECH

Table 16
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 2, Area L and M

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
L-56 PSSL 1-5 Primary	0	0	0		9/15/08	9/25/08	11/3/08	
L-56 PSSL 1-5 SE Grid	0	0	1					
L-56 PWL 1,2 Primary	0				10/10/08			
L-56 PWL 1,2 NW Grid	0							
M-58 PSSL 1-4 Primary	0	0	0		10/3/08	10/14/08	11/18/08	
M-58 PSSL 1-4 SW Grid	2	2	2					
M-58 PWL 1 Primary	0	0	0		10/14/08	12/11/08	1/16/09	
M-58 PWL 1 NW Grid	0	0	0					
M-58 PWL 2 Primary	0	0	0		12/2/08	12/11/08	1/16/09	
M-58 PWL 2 E Grid	0	0	0					
Well A Primary	0				1/5/09			
Well A W Grid	0							
Well B-D Primary	0	0	0		10/8/08	12/11/08	1/15/09	
Well B-D N Grid	0	0	1					

Graph 10 on Figure 13 does not include data from L-56 PWL 1, 2 or Well A because not enough data had been collected yet. All of the primary and control grids active burrow numbers remained at the pre-activity level except for L-56 1-5 and Wells B-D control grids. Each of those control grids increased by one active burrow through the six week mapping period.

X:\GIS\Lockheed 22289-0301\Site 2 Grids South.mxd



0 150 300 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- Monitoring Well Location
- Piezometer Well Location
- Primary Monitoring Grid Location
- Secondary Monitoring Grid Location
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Coordinates in UTM, Zone 11N, NAD83, meters

Beaumont Site 2

Figure 14

Southern Boundary Area SKR Monitoring Grid Locations

TETRA TECH

Table 17
2008 Pre-and Post-Activity SKR Schedule and Sign
Site 2, Southern Boundary Area

	# Active Burrows				Survey Dates			
Drilling Borehole Name(s)	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**	**Pre-Activity**	**1 Week**	**6 Week**	**6 Month**
SBA PSSL 1-3 Primary	7	3	7		10/7/08	10/14/08	11/18/08	
SBA PSSL 1-3 S Grid	0	0	0					

While it appears that the drilling activities affected the amount of active burrows in the one week mapping period, they did not. The burrow mapper monitored the drilling activities of SBA 1-3 and made sure that none of the active burrows were impacted. On 10/14/08 the mapper documented extreme wind conditions for the area, and that it appeared that the burrows had been filled in with sand and debris, and that no fresh kangaroo rat sign was visible within the once-active burrows. The burrows that were filled in with soil via wind were not recorded as active burrows for the one week mapping period. This is another example of how natural conditions can affect the amount of active burrows in an area.

3.4 COMPLIANCE WITH THE AVOIDANCE, MINIMIZATION AND MITIGATION ACTIVITIES

Monitoring was conducted to measure any potential permanent and temporary effects from investigation activities. Service-approved biological monitors who supervised each activity are listed in Tables 1 and 2. The following actions were undertaken to ensure compliance with avoidance and minimization measures:

1. A Service-approved biologist (biological monitor) performed pre-activity surveys to identify the location of SKR habitat and active burrows and all activities were supervised by a Service-approved biologist;
2. All characterization activities were completed during daylight hours or personnel arrived on site during daylight hours and left after sunrise the following day;
3. Due to vandalism security was deployed to monitor the characterization equipment when it was idle. The guards were allowed to move at reduced speeds at night on established roadways. This procedure yielded no take during the first three years of the ITP. As a result of the death of an SKR in late 2008 on a roadway, guards are no longer allowed to move at night. The guards are escorted to their locations by biological monitors and their odometer readings are recorded to ensure they do not move at night, except in the case of an emergency.
4. An orientation program about SKR and avoidance and minimization measures was provided to project workers during tailgate safety meetings (a formal program was instituted in 2007);
5. Burrows were flagged to aid workers in burrow avoidance, and the flags were removed when the task is completed;
6. All heavy equipment was guided by the Service-approved biologist to avoid active SKR burrows as much as possible using the LE HCP route priority system;
7. All off road vehicle or equipment traffic was limited to the same path in and out, moved slowly, and turned in gentle arching motions to minimize effects to the ground surface;
8. Mower blades were elevated 4 to 6 inches above the ground surface and limited to the smallest area possible to protect burrow sites;
9. In establishing parking and staging areas, the Service-approved biologist selected the parking and/or staging areas using the LE HCP priority system;
10. If burrows were present in a parking or staging area, load spreading devices were placed under the vehicles and/or equipment and were removed following use;
11. Parking of vehicles and staging of equipment overnight were restricted to existing roads. (When drilling rigs could not be moved, they were placed, using load-spreading devices, in areas more than 15 meters form any active kangaroo rat burrow);
12. Drilling/boring was restricted, to the maximum extent possible, to 15 feet or more from active SKR burrows; and
13. If burrows could not be avoided, load-spreading measures were placed over the burrows for vehicles and/or equipment setup and movement;

These actions comply with those listed to minimize effects on pages 12 and 13 of the LE HCP. In addition, following mitigation as described on page 13 of the LE HCP, boreholes were backfilled and disturbed soils were smoothed during investigation activities.

4.0 SUMMARY

In summary, the activities carried out under the ITP and LE HCP during the 2008 reporting period were conducted in accordance with the provisions of these permits. These activities resulted in minimal permanent and temporary effects to SKR habitat, as well as a take of one individual SKR. Although the same procedures have been utilized since the initial issuance of the ITP with no injury or death of any SKR, one SKR was killed in 2008. As a result, corrective measures have been implemented to further minimize any additional take.

Appendix A

Clarification of Effects on Stephens' Kangaroo Rat from Characterization Activities at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon)

Lockheed Martin Corporation, Shared Services
Energy, Environment, Safety and Health
2950 North Hollywood Way, Suite 125 Burbank, CA 91505
Telephone 818·847·0197 Facsimile 818·847·0256

LOCKHEED MARTIN

August 3, 2006

Randy Nagel
U.S. Fish and Wildlife Service
Carlsbad Field Office
6010 Hidden Valley Road
Carlsbad, CA 92011

Subject: Clarification of Effects on Stephens' Kangaroo Rat from Characterization Activities at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon)

Mr. Nagel:

On March 6, 2006 representatives from the U.S. Fish and Wildlife Service's (USFWS), the Lockheed Martin Corporation (LMC), and the California Department of Fish and Game (CDFG) met to clarify issues of temporary effects at the Lockheed Martin Corporation (LMC) and the California Department of Fish and Game (CDFG) Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon) properties. This letter summarizes the discussions held at that meeting.

LMC has been and continues to conduct groundwater and soil investigations on these Sites in response to a California Department of Toxic Substances Control (DTSC) Consent Order (No. 88/89-034). A Low-Effect Habitat Conservation Plan HCP) was signed on October 14, 2005 by the United States Fish and Wildlife Service (USFWS) and a consistency determination was granted on November 18, 2005 by CDFG for the activities associated with these investigations. Potential effects, such as incidental take of Stephens' Kangaroo Rat (SKR) by injury or death or modification of SKR habitat, from investigation activities are minimized through implementation of mitigation measures described in the Low-Effect HCP.

The Low-Effect HCP provides for permanent and temporarily affected habitats. Permanent effects include those that would prevent SKR from burrowing in an area, such as effects due to the installation of wells or other structures. These effects are defined in the Low-Effect HCP and are measurable impacts.

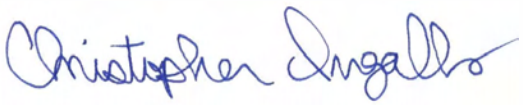
Temporary effects were defined in the Low-Effect HCP as those temporarily altering habitat, primarily from the flattening of grasses or soil compression due to off-road vehicle traffic. However, when attempting to measure these temporary adverse effects in the field, it was determined that several points required clarification. Since SKR prefers habitats with sparse shrub and herb cover and abundant bare mineral soil (Montgomery 2005), flattening of grasses or careful mowing enhances rather than diminishes the quality of habitat for SKR. In addition, field observations have confirmed that SKR will readily move and forage along narrow pathways of flattened grasses and/or bare ground.

Such pathways may be game trails, dirt roads, tire tracks, or other cleared areas (Montgomery 2005). Thus, careful driving using vehicles that do not compress soils (with tire pressures under about 60 pounds per square inch [psi]) would not adversely effect habitat for the SKR, but enhance it. Habitat restoration and/or management for SKR typically includes recommendations, such as careful mowing, to reduce and/or remove shrubs and grasses to increase the amount of available bare mineral soil generally preferred by SKR (Montgomery 2005).

Therefore, this letter clarifies that the definition and measurements of temporary impacts will not include those activities that enhance SKR habitat. Only adverse effects would be considered temporary impacts, and measured as specified in the Low-Effect HCP. An analysis was made of various activities and associated equipment that might be used on the Sites as further guidance for defining impacts. Table 1 lists vehicles and equipment that LMC might use on the Sites and an evaluation of potential effect on SKR habitat by Stephen J. Montgomery through field observations. These effects are all considered temporary and have been classified as either having a "beneficial," "adverse," or "no effect" (neither beneficial nor adverse) on SKR habitats at these Sites. Table 2 lists the general responsibilities of both operators and biological monitors at the Sites. These tables, and other activity-specific tables (such as the one made for mowing activities – see the attached Table 3), will be used to implement the provisions of the Low-Effect HCP.

LMC requests concurrence from your agency with the assessment of effects provided in this letter. LMC looks forward to your response and appreciates the opportunity to clarify the definition of temporary effects to SKR at Beaumont Site 1 and 2. If you have any questions or require additional information please feel free to contact Chris Ingalls at (818) 847-9901.

Sincerely,



Christopher M. Ingalls
Senior Technical Project Manager

Cc: Robin Maloney-Rames, California Department of Fish and Game
Stephen J. Montgomery, SJM Biological Consultants
Thomas Villeneuve, Tetra Tech, Inc.
BUR175 Final USFWS letter for temporary effects 071806

Reference

Montgomery, Stephen J. 2005. *Discussion of the Potential for Impacts to the Federally Endangered Stephens' Kangaroo Rat from a Proposed Seismic Study at Potrero Creek Site 1*. Prepared for Tetra Tech, Inc. April 2005.

Table 1 Temporary Effects from Vehicles and Equipment on SKR Habitat

Equipment		Activities[1]	Effects		Responsibilities	
Equipment Category	**Type of Equipment**		**Potential Effects**	**Category of Effects[2]**	**Operator**	**Monitor**
Lightweight-Tire Pressure Less than 60 psi	Handheld tools and equipment (shovels, hand-held auger, hand held mowing equipment)	Soil Characterization #1-2 Other #3	Vegetation flattening/thinning and minimal soil compaction, creating movement pathways for SKR	Beneficial (short and long-term)	General Responsibilities (see Table 2)	General Responsibilities (see Table 2)
Lightweight-Tire Pressure Less than 60 psi	Pickup truck up to ¾ ton (tire pressure 30-60 psi) with or without a trailer	Groundwater Characterization #1-6 Soil Characterization #1-5 Other #1-5	Vegetation flattening and minimal soil compaction, creating movement pathways for SKR	Beneficial (short and long-term)	General Responsibilities (see Table 2)	General Responsibilities (see Table 2)
Lightweight-Tire Pressure Less than 60 psi	All terrain vehicles (ATVs) with or without a trailer	Other #4	Vegetation flattening and minimal soil compaction, creating movement pathways for SKR	Beneficial (short and long-term)	General Responsibilities (see Table 2)	General Responsibilities (see Table 2)
Lightweight-Tire Pressure Less than 60 psi	Small tractor	Other #3	Vegetation flattening/thinning and minimal soil compaction, creating movement pathways for SKR	Beneficial (short and long-term)	General Responsibilities (see Table 2)	General Responsibilities (see Table 2)

Table 1 Temporary Effects from Vehicles and Equipment on SKR Habitat (page 2 of 3)

Equipment		Activities[1]	Effects		Responsibilities	
Equipment Category	**Type of Equipment**		**Potential Effects**	**Category of Effects[2]**	**Operator**	**Monitor**
Heavy-Tire Pressure Greater than 60 psi	Hollow-stem auger drill rig	Groundwater Characterization #2,3,5 Soil Characterization #2,3	Vegetation compaction and soil compaction	No effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures if burrows are present
Heavy-Tire Pressure Greater than 60 psi	Water truck or tank trailer	Groundwater Characterization #2 Other #2,4	Vegetation compaction and soil compaction	No effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures
Heavy-Tire Pressure Greater than 60 psi	Smeal rig	Groundwater Characterization #2	Vegetation compaction and soil compaction	No effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures
Heavy-Tire Pressure Greater than 60 psi	Dump truck	Soil Characterization #4 Other #2	Vegetation compaction and soil compaction	No effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures
Heavy-Tire Pressure Greater than 60 psi	Support truck and decontamination trailer	Groundwater Characterization #2,5 Soil Characterization #2	Vegetation compaction and soil compaction	No effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures

Table 1 Temporary Effects from Vehicles and Equipment on SKR Habitat (page 3 of 3)

Equipment		Activities[1]	Effects		Responsibilities	
Equipment Category	**Type of Equipment**		**Potential Effects**	**Category of Effects[2]**	**Operator**	**Monitor**
Excavation-Tire Pressure Greater than 60 psi	Backhoe	Groundwater Characterization #3, 5 Soil Characterization #4	Vegetation and soil removal and compaction	Temporary adverse effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures and consider needs for SKR trapping
Excavation-Tire Pressure Greater than 60 psi	Excavator	Groundwater Characterization #3, 5 Soil Characterization #4	Vegetation and soil removal and compaction	Temporary adverse effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures and consider needs for SKR trapping
Excavation_-Tire Pressure Greater than 60 psi	Front-end loader	Groundwater Characterization #1-6 Soil Characterization #1-5 Other #1-4	Vegetation and soil removal and compaction	Temporary adverse effect (short-term) Beneficial (long-term)	General Responsibilities (see Table 2) Use extreme care to avoid marked burrows, drive slowly and with gentle control, and used wide turning radius to avoid substrate "grinding" with wheels	General Responsibilities (see Table 2) Always use load-spreading measures and consider needs for SKR trapping

[1]Activities Legend

Groundwater Characterization

1. Groundwater sampling and measurements.
2. Well installation and repair, pilot studies at new wells, well development.
3. Well abandonment.
4. Groundwater treatment systems and routine maintenance.
5. Installation of extraction and injection wells and associated piping.
6. Influent and effluent sampling of systems.

Soil Characterization

1. Assessment of recognized areas of concern.
2. Mark, survey, and drill soil assessment boreholes.
3. Well abandonment.
4. Trenching and excavation.
5. Installation of soil gas probes.

Other

1. Road maintenance.
2. Deposit non-hazardous soils and broken concrete on-site.
3. Mowing.
4. MEC and UXO surveys and exposure.
5. Seismic surveys.

[2]Category of Effects

Beneficial effects are those related to compaction of vegetation and minimal surface soil disturbance, thus creating habitat for the SKR. These will only be beneficial in the long-term if the disturbance happens regularly, or results in a long-term lessening of vegetation in the disturbance area.

Effects listed as "no effect" or "temporary adverse effects" are for equipment and activities that may cause these types of effects in areas occupied by SKR. If the activity area is not occupied by SKR, these effects could instead be beneficial by creating habitat areas for this species. However, because of the overall potential for temporary effects to SKR from the use of these types of equipment, they have been included as having the potential for "no effect" or "temporary adverse effects."

Table 2 General Responsibilities

When	Construction/Field Personnel	Monitor
Before activity begins	1. Get clearance from a monitor before starting work in the work area. 2. Survey the work area for flagged burrows and plan route to avoid flagging. Use **only** the planned route and notify other workers of this route.	Conduct a pre-activity survey of the work area to determine: 1. Is soil dry enough to conduct this activity? Is soil composition strong enough to withstand approved trucks? If not, activity will be postponed. 2. Are there a large number of kangaroo rat burrows? If so, consider using load spreading measures or other mitigation techniques where possible. Will trapping be necessary to avoid substantial impacts to SKR? If so, delay activity in this area and contact Steve Montgomery and Kathy Simon. 3. Flag burrows to help operators avoid them. 4. Determine if there are other biological issues at or near the work area that need to be addressed during the project (bird nests, streambed issues, etc.). If so, please contact the Project Biologist to discuss.
During activity	1. Use existing roads or pavement whenever possible for driving and parking equipment. 2. Keep support vehicles and equipment on roads or pavement. 3. Use the same path in and out of the work area. 4. Turn equipment in a gentle arching pattern. 5. Only conduct activities during the day. 6. Stay at least 15 feet (5 meters) away from flagged burrows.	Conduct briefing during the tailgate safety meeting each morning 1. On the first day of an activity, review the Temporary Effects and General Responsibilities tables in detail for the specific activity or activities to be conducted, or the types of vehicles and/or equipment to be used. Ensure all workers understand what they have to do and why. 2. On subsequent days, stress aspects for improvement of compliance. If necessary, notify project supervisor of repeated or serious violations. 3. Continue to assess any changing needs for load spreading measures or other mitigation techniques. 4. Add information about any other biological issues noted during the pre-activity survey and how best avoid impacts to these resources.
At night or after activity is completed	1. Park equipment on pavement overnight. 2. Make sure all vehicle and equipment are properly removed from the site, or stored. Pick up all trash at and around the site and dispose of properly.	Conduct a post-activity survey of the work area to determine: 1. Note items such as on impacts from the activity on SKR or their habitat. Were there any possible adverse effects from the activity? If so, these need to be listed as permanent or temporary impacts and each one measured to include in the HCP Annual Report. 2. Remove flagging.

Additional Comments

- If the operator needs to make any changes to their activity, discuss with the biological monitor the work requirements or mitigation measures needed as soon as possible to prevent delays.
- The biological monitor has the authority to stop all activities until they are sure that activity will not cause "take" of SKR or SKR habitat.
- If "take" occurs due to negligence of the operator or monitor, the project may be shut down pending an investigation. This investigation could result in fines of up to $50,000 to an operator or monitor (not the company), and possible jail time.

MOWING

Equipment		Impacts		Responsibilities	
Equipment Category	**Type of Equipment**	**Potential Impacts**	**Category of Impacts**	**Operator**	**Monitor**
Hand Operated	Weed whacker	Removal and flattening of vegetation	Beneficial impacts	Remove vegetation from the smallest area that's practical.	See general responsibilities
Lightweight	Pickup truck up to ¾ ton (tire pressure 30-80 psi)	Flattening of vegetation	Beneficial impacts	See general responsibilities	See general responsibilities
	Tractor mower	Removal and flattening of vegetation	Beneficial impacts	Keep mower blade 4" to 6" above the ground at all times. Remove vegetation from the smallest area that's practical.	See general responsibilities
Heavy Equipment	Water truck	Crushing burrows	Temporary negative impacts	See general responsibilities	See general responsibilities Measure impacts and list measurements as temporary or permanent impacts. These measurements are needed for the HCP Annual Report.

Comments:

- This activity is covered under the Low-Effect HCP and is subject to all requirements of the HCP.
- If equipment other than that listed above will be used for mowing, please consult with the monitor on site or the Project Biologist (Kathy Simon 909-381-1674 or 909-289-4649).

Appendix B

August 2008 Update to the Clarification of Mapping Activities Proposed under the Low-Effect Habitat Conservation Plan for the Federally-Endangered Stephens' Kangaroo Rat at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon) Riverside County, California (Proposed Methodology for Mapping Stephens' Kangaroo Rat Habitat at Sites 1 and 2 and sample plot form included)

August 8, 2008

Jim Kelly
U.S. Fish and Wildlife Service
Carlsbad Field Office6010 Hidden Valley Road
Carlsbad, CA 92011

Subject: Revised Clarification of Mapping Activities Proposed Under the Low-Effect Habitat Conservation Plan for the Federally-Endangered Stephens' Kangaroo Rat (SKR) at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon) Riverside County, California (mapping methodology included).

Mr. Kelly:

A revised methodology for monitoring the effects of substrate disturbances on the Stephens' Kangaroo Rat at Sites 1 and 2 accompanies this letter. Since the original methodology clarification document by S.J. Montgomery (2006), a previously unforeseen type of disturbance at the Potrero Creek Landfill required a different monitoring method than described in the original document. The revised document adds a fifth method for monitoring potential effects of disturbance on SKR, and includes revisions to the figures illustrating all five methods.

On March 6, 2006, representatives from the U.S. Fish and Wildlife Service's (USFWS), the Lockheed Martin Corporation (LMC), and the California Department of Fish and Game (CDFG) met to clarify the mapping requirements of the Low-Effect Habitat Conservation Plan (HCP) for the Federally-Endangered SKR at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon). As requested during the meeting, this letter summarizes the proposed mapping program for SKR and SKR habitat at both Sites.

LMC has been and continues to conduct groundwater and soil investigations at the Beaumont Sites in response to a California Department of Toxic Substances Control (DTSC) Consent Order (No. 88/89-034). An Incidental Take Permit and associated Low-Effect Habitat Conservation Plan (HCP) were signed on October 14, 2005 by the USFWS and a consistency determination was granted on November 18, 2005 by CDFG for the activities associated with these investigations. The document describes the various investigative activities and the potential for incidental take of SKR or its habitat. The document also discusses the management practices required to be implemented to avoid incidental take. This Low-Effect HCP calls for mapping of SKR habitat under the Monitoring, Management, and Reporting requirements in Section 3.4 on Page 14:

> "Mapping of SKR occupied habitat (with density categories) will be conducted by the biological monitor within 100 feet of the work area at both Sites and within the 565 acres of the applicant-owned property on Site 1 at the initiation of the Low-Effect HCP. At the completion of the contaminant investigation activities, the SKR mapping areas will be updated and will be compared with initial mapping performed to report any increase or decrease in SKR-occupied acreage or density levels."

There are uncertainties with the required mapping procedure stated above. The attached Revised Proposed Methodology for Mapping SKR Habitat presents a program that would more effectively measure the impacts of various LMC activities on SKR, and would provide more useful information to LMC and the USFWS on the temporary effects of these activities on SKR and SKR habitat.

LMC requests concurrence from your agency with the attached Proposed Methodology for Mapping under our current Low-Effect HCP. LMC looks forward to your response and appreciates the opportunity to clarify these mapping activities. If you have any questions or require additional information please feel free to contact Tom Villeneuve at (909) 381-1674.

Sincerely,

Christopher Ingalls
Lockheed Martin Corporation

Cc: Robin Maloney-Rames, California Department of Fish and Game
Stephen J. Montgomery, SJM Biological Consultants

Literature Cited

Montgomery, Stephen J. 2006. Proposed methodology for mapping Stephens' kangaroo rat habitat at Sites 1 and 2. SJM Biological Consultants (November 2006)

REVISED PROPOSED METHODOLOGY FOR MAPPING STEPHENS' KANGAROO RAT HABITAT AT SITES 1 AND 2

Prepared by
Stephen J. Montgomery
SJM Biological Consultants, Inc.
August 2008

1.0 BACKGROUND

The Low-Effect Habitat Conservation Plan (HCP) calls for mapping of SKR habitat under the Monitoring, Management, and Reporting requirements in Section 3.4 on Page 14:

> "Mapping of SKR occupied habitat (with density categories) will be conducted by the biological monitor within 100 feet of the work area at both Sites and within the 565 acres of the applicant-owned property on Site 1 at the initiation of the Low-Effect HCP. At the completion of the contaminant investigation activities, the SKR mapping areas will be updated and will be compared with initial mapping performed to report any increase or decrease in SKR-occupied acreage or density levels."

There are several uncertainties with implementing the above mapping procedure, including:

- Whether this type of mapping (i.e. relatively coarse scale) would provide any useful measure of how and to what degree Lockheed Martin Corporation (LMC) activities on the Sites affect SKR and its habitat, because these activities affect such small areas compared to the overall area of SKR-occupied habitat.
- A lack of clarity on specific mapping requirements at work areas, such as timing of mapping pre- and post-activity, and the size of the mapping area.
- Whether post-activity mapping should occur following the full completion of all contaminant studies (after 5 years), or each year, or throughout each year. Updates for this mapping requirement are a specified element of the annual reports to be prepared for this Low-Effect HCP.

This memo presents an alternative protocol for habitat mapping that will:

1. Be clear relative to the size of monitoring plots, and the timing of monitoring activities
2. Be measurable at a scale commensurate with LMC's activities;
3. Provide useful information to LMC in their on-going efforts to minimize adverse effects to this species while conducting contaminant investigation activities; and

4. Provide useful data to the U.S. Fish and Wildlife Service in determining on-going potential adverse effects to this species from these types of activities.

2.0 PROPOSED MAPPING METHODS

The proposed methodology will be based on burrow counts at study plots located in activity areas and at associated control plots, as described below.

2.1 Activities to Be Conducted

Activities to be conducted under the Low-Effect HCP are defined on pages 7 and 8 of the HCP, and include:

1. Conducting quarterly groundwater level measurements, sampling, and repair;
2. Installing groundwater wells;
3. Abandoning groundwater wells;
4. Maintaining structures and groundwater treatment systems;
5. Maintaining roads;
6. Marking, surveying and drilling soil assessment boreholes:
7. Installing and sampling soil gas probes;
8. Removing CatOx unit at Site 1 (completed in 2005);
9. Temporarily depositing soils and concrete from on-site activities;
10. Mowing work areas;
11. Surveying work locations;
12. Conducting unexploded ordinance (UXO) characterization and treatment activities (see letter to USFWS dated August 3, 2006 for clarification of these activities); and
13. Conducting seismic surveys.

2.2 Activities to Be Mapped vs. Not Mapped

2.2.1 Mapped

In general, mapping will only be conducted in areas of suitable SKR habitat, including all areas of Sites 1 and 2 that support grassland habitats whether they are known to be occupied by SKR or not. Mapping will not be conducted in areas of non-suitable habitat, such as on steep hillsides, in dense sage scrub or chaparral habitat, or in very sandy washes. Of the 13 activities listed above, the proposed mapping methodology described below will only be used for those activities that (a) could result in adverse effects to occupied SKR habitat from direct soil or vegetation disturbance or removal (see letter to USFWS dated August 3, 2006 for clarification of these activities), and (b) encompass an area large enough for any effects on SKR to be measurable (defined as a work area of approximately 250 square meters; i.e. an approximately 15m x 15m square). Such activities include:

- Installation of groundwater wells;
- Drilling boreholes for soil assessment;

- Groundwater well abandonment at sites where heavy equipment use is required at the work area;
- Maintaining and repairing roads when this activity covers an area of at least 250 square meters.
- Extensive mowing of work areas when this activity covers at least 2 acres.

2.2.2 Not Mapped

The following activities were determined to cover an area too small, and/or result in such minimal disturbances to the substrate or vegetation cover, to provide measurable data:

- Conducting quarterly groundwater level measurements, sampling, and repair;
- Abandoning groundwater wells at sites where heavy equipment can be parked on adjacent roads and not brought on the work area;
- Maintaining structures and groundwater treatment systems;
- Maintaining and repairing roads when this activity covers an area of less than 250 square meters;
- Marking and surveying soil assessment boreholes;
- Installing and sampling soil gas probes if done by truck mounted direct push methods;
- Temporarily depositing soils and concrete from on-site activities;
- Mowing work areas when this activity covers an area of less than 250 square meters;
- Surveying work locations;
- Conducting UXO and MEC characterization activities;
- Conducting seismic surveys

2.3 Mapping Strategies

Five different mapping strategies will be used to appropriately measure the effects of the work activities listed in Section 2.2.1 above. These include:

1. 100% mapping of **small work areas** (including well installations and well abandonment).
2. 25% minimum sampling of work areas for linear activities (road maintenance).
3. 25% minimum sampling of work areas when numerous extremely small excavations will be clustered in a particular area.
4. 25% minimum sampling of work areas where extensive blocks of habitat will be mowed.
5. 100% mapping of **larger work areas** of approximately 1-3 acres

2.3.1 100% Mapping of Small Work Areas (Figure 1)

The effects on SKR of work activities such as well installation that encompass relatively small areas (e.g. approx. 250m^2) will be determined using small square plots centered directly on the activity and paired plots located 100m from the activity area.

Each work area plot will be centered on the location of a work activity and will be designated "Plot A." A paired location designated "Plot B" will be located in a random direction and 100 meters from the activity area and will serve as a control plot for the associated Plot A (see figure below). All work area and control plots will be oriented in cardinal directions with the four corner points marked with a Global Positioning Systems (GPS) unit to an accuracy of less than 5 meters (UTM NAD 83). Plots will measure 15 x15 meters for all of these activities.

The direction to the center of Plot B from the center of Plot A will be determined randomly from one of 8 compass directions (N, S, E, W, NE, SE, SW, NW). If the initially selected control Plot B location does not fall in suitable and similar SKR habitat to Plot A, subsequent random directions will be progressively selected until the selected control plot falls in suitable and similar SKR habitat that does not overlap any other work area.

2.3.2 25% Minimum Mapping of Numerous Clustered Small Work Areas (Figure 2)
For activities involving numerous small disturbances to the substrate within a somewhat lager but still relatively small area (e.g. 500m^2), the effects on SKR will be determined by sampling a minimum of 25% of these areas using the same method as that described above for "100% Mapping of Small Work Areas."

2.3.3 25% Minimum Mapping of Linear Work Areas (Figure 3)
The effects on SKR of linear activities such as road maintenance will be determined using long-narrow plots. For road maintenance activities, work area and control plots will measure 5m x 22.5m and be established on directly opposing sides of the road; each plot will begin at the edge of the road and extend 5m into the surrounding undisturbed habitat. Appropriate plot size for additional linear activities will be determined at the time of the initiation of the activity.

2.3.4 25% Minimum Mapping of Larger Mowing Work Areas (Figure 4)
More expansive work areas such as the large areas requiring mowing for MEC investigations, as well as "numerous clustered small work areas", will be assessed by sampling a series of small 15m x 15m square plots randomly selected within the activity area; control plots for such sample plots will be located in adjacent non-activity areas, either within 100m of the work area plot or as close as is feasible. A minimum of 25% of the work area will be sampled with this method. Since the October 2006 Esperanza fire burned all grasslands at Potrero Creek, this method of assessing the effects of widespread mowing on SKR will not be used at the current time. This method will be used if any future investigations require mowing of large blocks of grassland vegetation.

2.3.5 100% mapping of **larger work areas** of approximately 1-3 acres (Figure 5)

Larger (e.g. 1-3 acres in size) areas of extensive substrate disturbance, such as at the western landfill, will be completely mapped for active SKR burrows. Active burrows will initially be mapped prior to the proposed substrate disturbance, and then again following completion of these disturbances. This procedure follows the basic method originally

proposed by the FWS for the 565-acre area owned by Locked (see Section 3.4 of the Low-Effect HCP, page 14).

2.4 Frequency and Timing of Mapping

Pre-activity surveys would be conducted within 7 days prior to an activity. Post-activity surveys would be conducted within 7 days (±2 days), 6-weeks (±5 days) and 6-months (±7days) subsequent to each activity. These mapping surveys will provide data on immediate and long-term effects of each activity on localized populations of SKR in the immediate vicinity of the activity, and also may provide information regarding enhanced use of the activity area by this species.

2.5 Burrow Counts

All active kangaroo rat burrows inside the boundaries of each pair of plots (e.g. 1A and 1B, 2A and 2B, etc.) will be counted and their locations noted on standard plot forms during all pre- and post-activity surveys. The map and number of burrows counted at each plot will serve as records of SKR presence/absence and as an index of SKR activity and abundance at each plot.

2.6 Analysis and Reporting

The burrow counts and plot maps from all pre- and post-activity surveys at work areas and control plots, or within the same disturbance area for larger 100% count areas, will be compared over time to determine if specific activities produce any measurable difference in SKR presence and/or abundance compared to the associated control plots. Burrow count data will be analyzed using a paired-sample t- test or other appropriate paired sample statistical method. If plots of different sizes are required during the study, the burrow counts recorded for all sites will be standardized to number of burrows per square meter.

All burrow counts and plot maps from surveys conducted each year, and the associated analyses, will be compiled and presented in an annual monitoring report for the Low-Effect HCP. Any natural occurrences such as weather events or fires would be assumed to affect each study plot and its paired control site in a similar way. Such unavoidable occurrences are not expected to affect the validity of the study results because of the use of paired study and control plots, which will be similarly affected by natural phenomenon and can therefore be compared.

Figure 1

100% Sampling of Small Work Areas

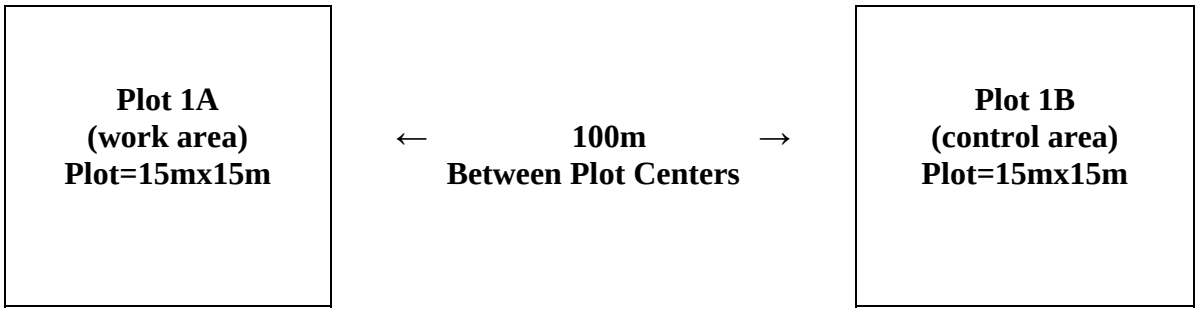


Figure 2
25% Minimum Sampling of Numerous Clustered Small Work Areas
(asterisks are work areas, heavy outline is example of sample plot area)

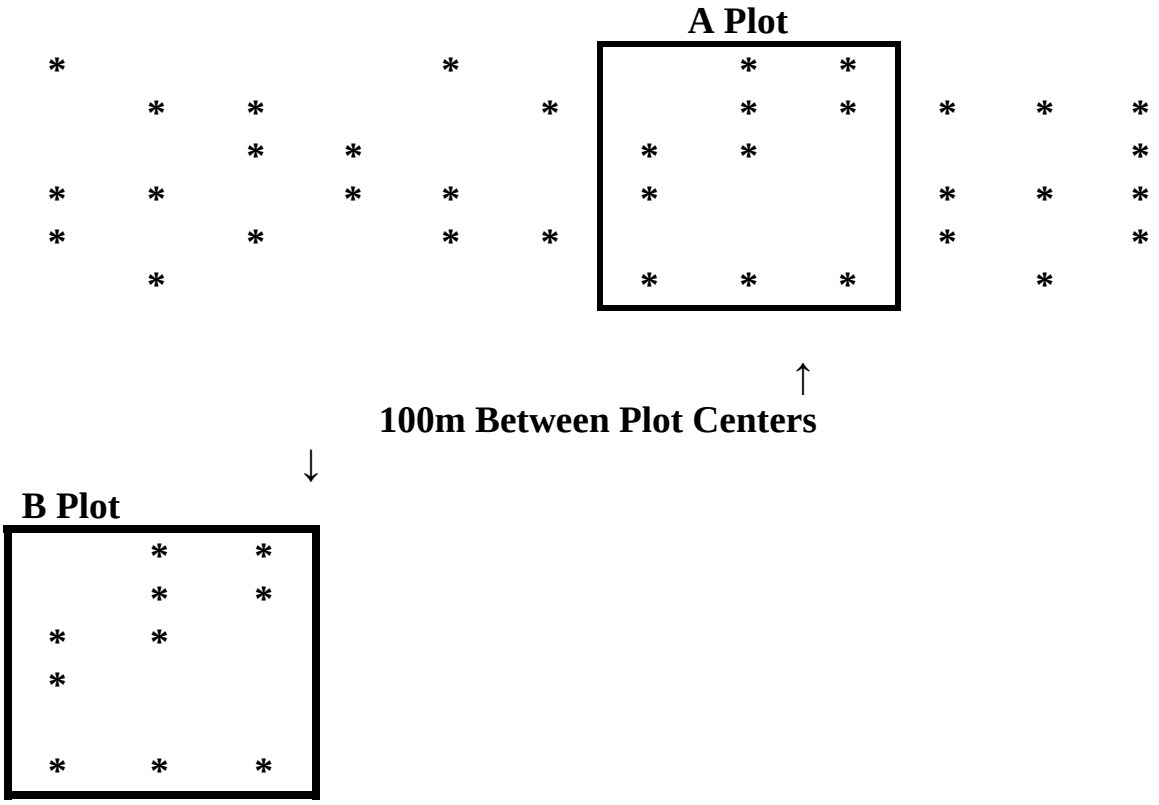


Figure 3
25% Minimum Sampling of Linear Work Areas

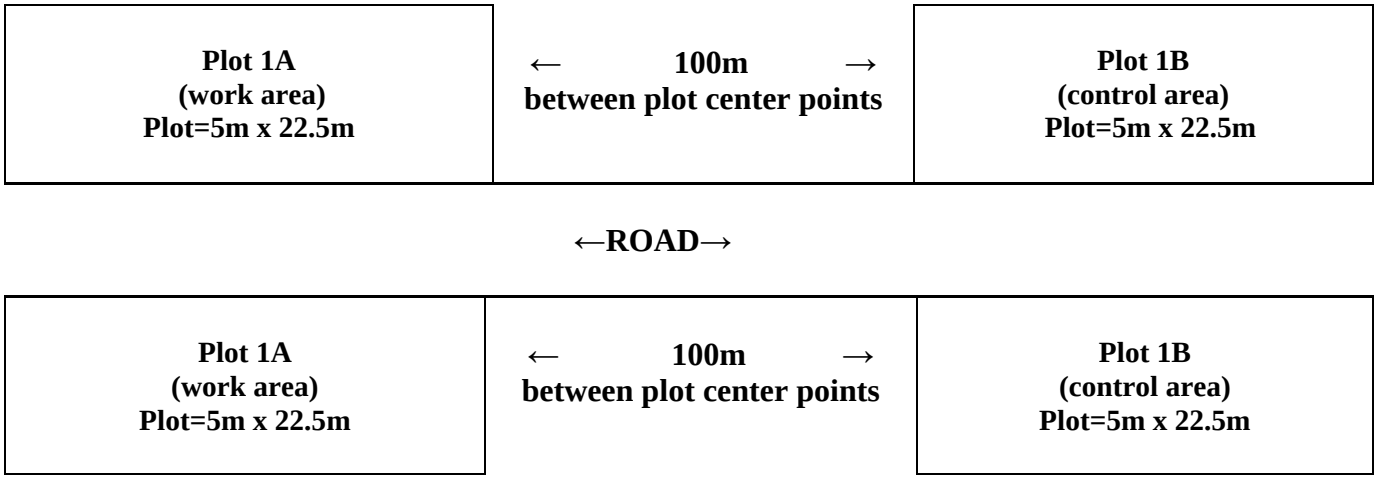
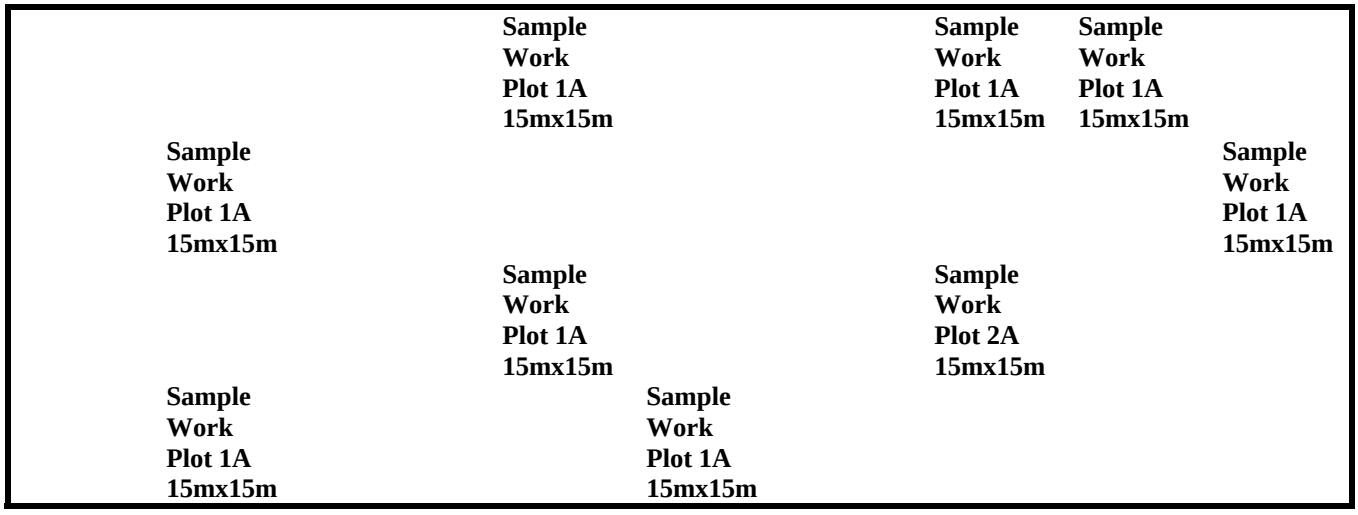


Figure 4
25% Minimum Sampling of Larger Mowed Work Areas, E.g. 1-20 Acres in Size

A Plots in Mowed Area



(continued)

Figure 4 (continued)

B Plots Outside of Mowed Area

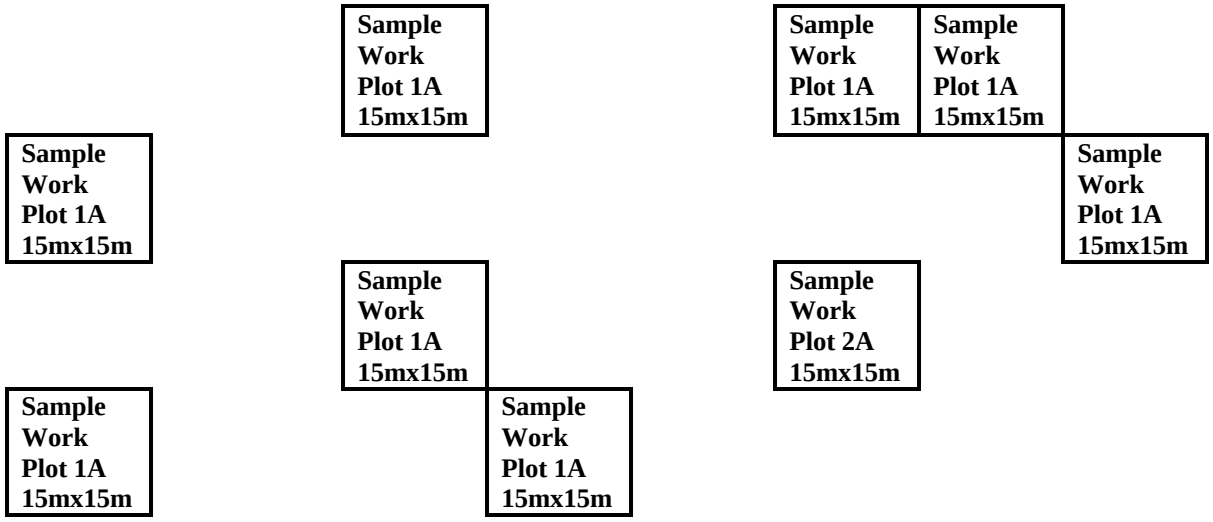


Figure 5.

100% Before-and-After Total Burrow Count for Larger Heavily Disturbed Areas, e.g. 1-3 Acres in Size, With Relatively Large Disturbance Sites (no control plots)

Disturbance Area			Disturbance Area		Disturbance Area	
	Disturbance Area				Disturbance Area	
	Disturbance Area	Disturbance Area		Disturbance Area		
Disturbance Area				Disturbance Area		
						Disturbance Area
Disturbance Area	Disturbance Area	Disturbance Area	Disturbance Area		Disturbance Area	Disturbance Area
			Disturbance Area		Disturbance Area	Disturbance Area

Appendix C

2008 Species Lists for Potrero Creek

Species Groups and Species		Grassland (including small areas with tree overstory)	Scrubs (including coastal sage scrubs)	Chamise/Chaparral	Wash with open water component	Dry Wash
Scientific name	**Common Name**					
INVERTEBRATES						
fairy shrimp						
Branchinecta lindahli	fairy shrimp	X				
Branchinecta lynchi	**vernal pool fairy shrimp**	X				
Streptocephalus dorothae	fairy shrimp	X				
Streptocephalus woottoni	**Riverside fairy shrimp**	X				
Dragonflies and damselflies						
Enallagma sp.	blue damselfly				X	X
Crickets, Grasshoppers, and Katydids						
Melanoplus differentialis	differential grasshopper	X	X	X	X	X
Spharagemon collare	mottled sand grasshopper	X	X	X	X	X
Beetles						
Dinacoma marginata	scarab beetle	X	X	X		
Eleodes sp.	stink beetle	X	X	X		
Ants, Wasps, and Bees						
Camponotus sp.	carpenter ant	X	X	X	X	X
Dasmutilla sp.	velvet ant	X	X	X	X	X
Hemipepsis sp.	tarantula wasp	X	X	X	X	X
Spiders						
Latrodectus hesperus	black widow spider	X	X	X	X	X
AMPHIBIANS						
Salamanders						
Aneides lugubris	arboreal salamander	X			X	X
Batrachoseps pacificus major	garden slender salamander				X	X
Frogs and Toads						
Bufo boreas halophilus	California toad	X	X	X	X	X
Bufo microscaphus californicus	**arroyo toad**					
Pseudacris cadaverina	California chorus frog				X	X
Pseudacris regilla	pacific treefrog				X	X
Spea hammondii	**western spadefoot**	X	X	X	X	X
REPTILES						
Skinks						
Eumeces skiltonianus interparietalis	**Coronado Island skink**		X	X		X
Lizards						
Anniella pulchra pulchra	**silvery legless lizard**				X	X
Cnemidophorus hyperythrus beldingi	**orange-throated whiptail**	X	X	X		
Cnemidophorus tigris multiscutatus	coastal whiptail	X	X	X		
Elgaria multicarinata webbi	southern alligator lizard	X	X	X		X
Phrynosoma coronatum blainvillii	**coast (San Diego) horned lizard**	X	X	X		X
Sceloporus occidentalis	fence lizard	X	X	X		X
Sceloporus orcutti	granite spiny lizard		X	X		
Uta stanisburiana	side-blotched lizard	X	X	X		X
Xantusia henshawi	granite night lizard	X	X	X		
Snakes						
Charina bottae	rubber boa		X	X		X
Crotalus viridis helleri	southern Pacific rattlesnake					
Crotalus ruber ruber	**northern red diamond rattlesnake**	X	X	X		X
Crotalus viridis	western rattlesnake	X	X	X		X
Lampropeltis getula	California kingsnake		X	X		
Leptotyphlops humilis	western blind snake				X	X
Lichanura trivirgata	**rosy boa**		X	X	X	X
Masticophis flagellum	coachwhip	X	X	X		X
Masticophis lateralis	California striped racer		X	X	X	X
Pituophis catenifer annectens	San Diego gopher snake				X	X
Pituophis melanoleucus	gopher snake				X	X
Salvadora hexalepis virgulti	**coast patch nosed snake**		X	X		X
Thamnophis hammondi	**two-striped garter snake**				X	X

Species Groups and Species		Grassland (including small areas with tree overstory)	Scrubs (including coastal sage scrubs)	Chamise/Chaparral	Wash with open water component	Dry Wash
Scientific name	**Common Name**					
BIRDS						
herbivores						
Carduelis tristis	American goldfinch	X	X	X		
Calypte anna	Anna's hummingbird	X	X	X	X	X
Archilochus alexandri	black-chinned hummingbird	X	X	X	X	X
Spizella atrogularis	**black-chinned sparrow**	X	X	X		
Pheucticus melanocephalus	black-headed grosbeak		X	X	X	X
Guiraca caerulea	blue grosbeak	X	X	X	X	X
Icterus bullockii	Bullock's oriole	X			X	X
Eremophila alpestris	**California horned lark**		X			
Callipepla californica	California quail	X	X	X		
Stellula calliope	calliope hummingbird	X				
Spizella passerina	chipping sparrow	X				
Calypte costae	**Costa's hummingbird**	X	X	X	X	X
Passerella iliaca	fox sparrow	X			X	X
Zonotrichia atricapilla	golden-crowned sparrow	X				
Carpodacus mexicanus	house finch	X	X	X	X	X
Vireo huttoni	Hutton's vireo	X			X	X
Carpodacus grammacus	lark sparrow	X	X			
Carduelis lawrencii	**Lawrence's goldfinch**	X	X	X		
Vireo bellii pusillus	**least Bell's vireo**				X	X
Carduelis psaltria	lesser goldfinch	X				
Melospiza lincolnii	Lincoln's sparrow				X	X
Anas platyrhynchos	mallard				X	
Sialia currucoides	mountain bluebird	X				
Oreortyx pictus	mountain quail	X	X	X		
Icterus galbula	northern oriole				X	X
Contopus cooperi	olive-sided flycacther	X	X	X		X
Phainopepla nitens	phainopepla	X				
Parus inornatus	plain titmouse	X			X	X
Sphyrapicus ruber	red-breasted sapsucker	X				
Stelgidopteryx ruficollis	rough-winged swallow				X	X
Selasphorus rufus	**rufous hummingbird**	X	X			
Aimophila ruficeps	rufous-crowned sparrow	X	X	X		
Pipilo erythrophthalmus	rufous-sided towhee	X				
Melospiza melodia	**song sparrow**	X			X	X
Aimophila ruficeps canescens	**Southern California rufous-crowned sparrow**	X	X	X		
Pipilo maculates	spotted towhee	X				
Catharus ustulatus	Swainson's thrush				X	X
Tachycineta thalassina	violet-green swallow	X				
Sialia mexicana	western bluebird	X				
Piranga ludoviciana	western tanager	X				
Aeronautes saxatalis	white-throated swift			X	X	
Chamaea fasciata	wrentit	X	X	X		
insertivores						
Anthus spinoletta	american pipit	X				
Myiarchus cinerascens	ash-throated flycatcher	X	X	X		
Hirundo rustica	barn swallow	X	X	X	X	X
Thryomanes bewickii	Bewick's wren	X	X			
Sayornis nigricans	black phoebe				X	
Dendroica nigrescens	black-throated gray warbler	X	X	X	X	X
Polioptila caerulea	blue-gray gnatcatcher	X	X	X		
Psaltriparus minimus	bushtit	X			X	X
Polioptila californica	California gnatcatcher	X	X	X		
Catherpes mexicanus	canyon wren	X	X	X		
Tyrannus vociferans	Cassin's kingbird	X	X	X		X
Hirundo pyrrhonota	cliff swallow	X	X	X	X	X
Columbina passerina	common ground-dove	X	X			
Phalaenoptilus nuttallii	common poorwill					X
Geothlypis trichas	common yellowthroat				X	X

Species Groups and Species		Grassland (including small areas with tree overstory)	Scrubs (including coastal sage scrubs)	Chamise/Chaparral	Wash with open water component	Dry Wash
Scientific name	**Common Name**					
Ammodramus savannrum	**grasshopper sparrow**		X	X		
Tringa melanoleuca	greater yellowlegs				X	
Catharus guttatus	hermit thrush	X			X	X
Troglodytes aedon	house wren	X	X	X		
Charadrius vociferus	killdeer	X				
Chordeiles acutipennis	lesser nighthawk	X	X	X		
Cistothorus palustris	marsh wren				X	
Zenaida macroura	mourning dove	X	X	X		X
Vermivora ruficapilla	Nashville warbler				X	X
Colaptes auratus	northern flicker	X				
Stelgidopteryx serripennis	northern rough-winged swallow	X	X	X	X	X
Picoides nuttallii	**Nuttall's woodpecker**	X			X	
Baeolophus inornatus	**oak titmouse**	X			X	X
Vermivora celata	orange-crowned warbler				X	X
Empidonax difficilis	Pacific-slope flycatcher	X				
Agelaius phoeniceus	red-winged blackbird				X	
Salpinctes obsoletus	rock wren					X
Regulus calendula	ruby-crowned kinglet	X	X			
Oreoscoptes montanus	sage thrasher	X	X	X		X
Sayornis saya	Say's phoebe	X	X	X		
Empidonax traillii extimus	**southwestern willow flycatcher**				X	X
Agelaius tricolor	**tri-colored blackbird**				X	
Vireo gilvus	warbling vireo				X	X
Anthus spinoletta	water pipit					
Sturnella neglecta	western meadowlark	X		X		
Contopus sordidulus	western wood-pewee	X			X	X
Sitta carolinensis	white-breasted nuthatch	X				
Dendroica petechia	**yellow warbler**				X	X
Sphyrapicus varius	yellow-bellied sapsucker	X				
Icteria virens	**yellow-breasted chat**	X	X	X		
omnivores						
Melanerpes formicivorus	acorn woodpecker	X			X	X
Corvus brachyrhynchos	American crow	X			X	X
Passerculus sandwichensis beldingi	**Belding's savannah sparrow**				X	
Amphispiza belli belli	**Bell's sage sparrow**		X	X		
Euphagus cyanocephalus	Brewer's blackbird	X				
Molothrus aster	brown-headed cowbird	X				
Passerculus sandwichensis alaudinus	**Bryant's savannah sparrow**				X	
Toxostoma redivivum	California thrasher		X	X		
Pipilo crissalis	California towhee				X	X
Corvus corax	common raven	X			X	X
Junco hyemalis	dark-eyed junco			X	X	X
Picoides pubescens	downy woodpecker	X			X	X
Sturnus vulgaris	European starling	X				
Geococcyx californianus	greater roadrunner	X	X	X	X	X
Picoides villosus	hairy woodpecker	X			X	X
Passer domesticus	house sparrow	X	X	X	X	X
Passerculus sandwichensis rostratus	**large-billed savannah sparrow**				X	
Passerina amoena	lazuli bunting		X	X	X	X
Melanerpes lewis	**Lewis' woodpecker**	X			X	X
Mimus polyglottos	northern mockingbird	X				
Columba livia	rock dove	X				
Amphispiza belli	sage sparrow	X	X	X		
Passerculus sandwichensis	savannah sparrow				X	
Pooecetes gramineus	vesper sparrow	X	X	X		
Tyrannus verticalis	western kingbird	X				
Aphelocoma californica	western scrub-jay		X	X		
Zonotrichia leucophrys	white-crowned sparrow	X				
Wilsonia pusilla	Wilson's warbler				X	
Dendroica coronata	yellow-rumped warbler				X	X

Species Groups and Species		Grassland (including small areas with tree overstory)	Scrubs (including coastal sage scrubs)	Chamise/Chaparral	Wash with open water component	Dry Wash
Scientific name	**Common Name**					
carnivores						
Falco sparverius	American kestrel	X				
Falco pregrinus	**American peregrine falcon**				X	
Pelecanus erythrorhynchos	American white pelican (not nesting)	X				
Tyto alba	barn owl				X	X
Athene cunicularia	**burrowing owl**	X				
Accipiter cooperii	**Cooper's hawk**				X	X
Buteo regalis	**ferruginous hawk**	X				
Aquila chrysaetos	**golden eagle**	X	X	X		
Bubo virginianus	great horned owl	X			X	X
Lanius ludovicianus	**loggerhead shrike**	X				
Asio otus	**long-eared owl**				X	
Falco columbarius	**merlin**	X			X	X
Circus cyaneus	**northern harrier**	X			X	
Falco mexicanus	**prairie falcon**	X				
Buteo lineatus	red-shouldered hawk				X	X
Buteo jamaicensis	red-tailed hawk	X			X	X
Accipiter striatus	**sharp-shinned hawk**				X	X
Asio flammeus	**short-eared owl**	X				X
Buteo swainsonii	**swainson's hawk**	X				
Cathartes aura	turkey vulture	X	X	X		
Otus kennicottii	western screech owl				X	
Plegadis chihi	**white-faced ibis**				X	
Elanus caerulus	**white-tailed kite**	X				
MAMMALS						
small herbivores						
Chaetodipus fallax	Dulzura pocket mouse	X	X	X	X	X
Chaetodipus fallax fallax	**San Diego pocket mouse**	X	X	X		
Dipodomys agilis	Pacific kangaroo rat	X				X
Dipodomys merriami parvus	**San Bernardino kangaroo rat**	X				X
Dipodomys simulans	Dulzura kangaroo rat	X	X	X	X	X
Dipodomys stephensi	**Stephens' kangaroo rat**	X				
Lepus californicus	black-tailed jackrabbit	X	X	X		X
Lepus californicus bennettii	**San Diego black-tailed jackrabbit**	X	X	X		X
Mus musculas	house mouse	X				
Neotoma lepida	desert woodrat	X				X
Neotoma lepida intermedia	**San Diego desert woodrat**	X				X
Neotoma macrotis	big-eared woodrat	X				X
Perognathus longimembris brevinasus	**Los Angeles pocket mouse**	X	X	X		
Peromyscus maniculatus	deer mouse	X	X	X		X
Peromyscus boylii	brush mouse	X	X	X	X	X
Peromyscus californicus	California mouse	X	X	X	X	X
Peromyscus eremicus	cactus mouse	X	X	X	X	X
Reithrodontomys megalotis	western harvet mouse	X	X	X		X
Spermophilus beecheyi	California ground squirrel	X	X	X	X	X
Sylvilagus audubonii	desert cottontail	X	X	X	X	X
Sylvilagus bachmani	brush rabbit				X	X
small insectivores						
Antrozous pallidus	**pallid bat**	X	X	X	X	X
Eptesicus fuscus	big brown bat	X	X	X	X	X
Eumops perotis	**western mastiff bat**	X	X	X	X	X
Lasiurus blossevillii	**western red bat**	X	X	X	X	X
Myotis ciliolabrum	**small-footed myotis**	X	X	X	X	X
Myotis yumanensis	**Yuma myotis**	X	X	X	X	X
Nyctinomops femerosaccus	**pocketed free-tailed bat**	X	X	X	X	X
Thomomys bottae	Botta's pocket gopher	X	X	X	X	X
large herbivores						
Bos taurus	domestic cattle	X				
Odocoileus hemionus	mule deer	X	X	X	X	X

Species Groups and Species		Grassland (including small areas with tree overstory)	Scrubs (including coastal sage scrubs)	Chamise/Chaparral	Wash with open water component	Dry Wash
Scientific name	**Common Name**					
carnivores						
Bassariscus astutus	ringtail				X	X
Canis familiaris	domestic dog	X				
Canis latrans	coyote	X	X	X	X	X
Felis rufus	bobcat	X	X	X	X	X
Mustela frenata	long-tailed weasel				X	X
Onychomys torridus ramona	**southern grasshopper mouse**	X			X	X
Procyon lotor	raccoon	X	X	X	X	X
Puma concolor	mountain lion (foraging only)	X	X	X	X	X
Taxidea taxus	**American badger**	X			X	X
Urocyon cinereoargenteus	gray fox	X	X	X	X	X

Species Groups and Species		Operational Area											
Scientific name	Common Name	A	B	C	D	E	F	G	H	I	Conservation Easement (outside OAs)	Lower Massacre Canyon	Other Areas Outside of OAs
INVERTEBRATES													
fairy shrimp													
Branchinecta lindahli	fairy shrimp	X	O	X									X
Branchinecta lynchi	**vernal pool fairy shrimp**	X	X	X									X
Streptocephalus dorothae	fairy shrimp	X	X	X									X
Streptocephalus woottoni	**Riverside fairy shrimp**	X	X	X									X
Dragonflies and damselflies													
Enallagma sp.	blue damselfly	X	O	O	O	X	O	O	X	X	O	O	X
Crickets, Grasshoppers, and Katydids													
Melanoplus differentialis	differential grasshopper	O	O	X	X	X	X	X	X	X	X	X	X
Spharagemon collare	mottled sand grasshopper	O	O	X	X	X	X	X	X	X	X	X	X
Beetles													
Dinacoma marginata	scarab beetle	X	X	X	X	X	X	X	X	X	X	X	X
Eleodes sp.	stink beetle	O	O	O	O	O	O	O	O	O	O	O	O
Ants, Wasps, and Bees													
Camponotus sp.	carpenter ant	O	O	O	O	O	O	O	O	O	O	O	O
Dasmutilla sp.	velvet ant	O	O	O	O	O	O	O	O	O	O	O	O
Hemipepsis sp.	tarantula wasp	X	O	O	O	X	O	O	X	X	O	O	X
Spiders													
Latrodectus hesperus	black widow spider	O	O	X	X	O	O	X	X	X	X	X	X
AMPHIBIANS													
Salamanders													
Aneides lugubris	arboreal salamander	X	X	X							X	X	X
Batrachoseps pacificus major	garden slender salamander	X	X	X	X	X	X	X	X	X	X	X	X
Frogs and Toads													
Bufo boreas halophilus	California toad	O	O	X	X	X	X	X	X	X	X	X	X
Bufo microscaphus californicus	**arroyo toad**		X		X		X	X			X		X
Pseudacris cadaverina	California treefrog	O*	X	X	X	X	X	X	X	X	O	X	O
Pseudacris regilla	pacific treefrog	O*	X	X	X	X	X	X	X	X	O	X	O
Spea hammondii	**western spadefoot**	X	X	X	X	X	X	X	X	X	X	X	X
REPTILES													
Skinks													
Eumeces skiltonianus interparietalis	**Coronado Island skink**	X	X		X		X	X			X		X
Lizards													
Anniella pulchra pulchra	**silvery legless lizard**		X		X		X	X			X	X	
Cnemidophorus hyperythrus beldingi	**orange-throated whiptail**	X	X	X	X	X	X	X	X	X	X	X	X
Cnemidophorus tigris multiscutatus	coastal whiptail	X	X	X	X	X	X	X	X	X	X	X	X
Elgaria multicarinata webbi	southern alligator lizard	X	X	X	X	X	X	X	X	X	X	X	X
Phrynosoma coronatum blainvillii	**coast (San Diego) horned lizard**	X	X	X	X	X	X	X	X	X	X	X	X
Sceloporus occidentalis	fence lizard	X	X	X	X	X	X	X	X	X	X	X	X
Sceloporus orcutti	granite spiny lizard	X	O	X	X	X	X	X	X	X	X	X	X
Uta stanisburiana	side-blotched lizard	X	X	X	X	X	X	X	X	X	X	X	X
Xantusia henshawi	granite night lizard		X		X		X	X			X	X	
Snakes													
Charina bottae	rubber boa	X	X	X	X	X	X	X	X	X	X	X	X
Crotalus viridis helleri	southern Pacific rattlesnake	X	X	X	X	X	X	X	X	X	X	X	X
Crotalus ruber ruber	**northern red diamond rattlesnake**	X	O	X	X	X	X	X	X	X	X	X	X
Crotalus viridis	western rattlesnake	X	X	X	X	X	X	X	X	X	X	X	X
Lampropeltis getula	California kingsnake	X	X	X	X	X	X	X	X	X	X	X	X
Leptotyphlops humilis	western blind snake		X		X		X	X			X	X	
Lichanura trivirgata	**rosy boa**	X	X	X	X	X	X	X	X	X	X	X	X
Masticophis flagellum	coachwhip	X	X	X	X	X	X	X	X	X	X	X	X
Masticophis lateralis	California striped racer	X	X	X	X	X	X	X	X	X	X	X	X

Species Groups and Species		Operational Area											
											Conservation Easement (outside OAs)	Lower Massacre Canyon	Other Areas Outside of OAs
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Pituophis catenifer annectens	San Diego gopher snake	X	X	X	X	X	X	X	X	X	X	X	X
Pituophis melanoleucus	gopher snake	X	X	X	X	X	X	X	X	X	X	X	X
Salvadora hexalepis virgultea	**coast patch nosed snake**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Thamnophis hammondi	**two-striped garter snake**		**X**		**X**		**X**	**X**			**X**	**X**	
BIRDS													
herbivores													
Carduelis tristis	American goldfinch	O	X	O	X	X	O	O*	X	X	X		X
Calypte anna	Anna's hummingbird	O*	X	O			O*	O*	O*	X	O*		X
Archilochus alexandri	black-chinned hummingbird	X	X	O	X	X	O	X	X	X	X	X	X
Spizella atrogularis	**black-chinned sparrow**	**X**	**X**	**O**	**X**	**X**	**X**	**X**	**X**	**X**	**X**		**X**
Pheucticus melanocephalus	black-headed grosbeak	O	X	X	O	X	O	X	X	X	X		X
Guiraca caerulea	blue grosbeak	X	X	X	X	X	O	X	X	X	X		X
Icterus bullockii	Bullock's oriole	O	X	O	O	X	X	X		X	X		X
Eremophila alpestris	**California horned lark**	**X**	**X**	**O***	**O***		**O***	**X**		**X**	**X**		**X**
Callipepla californica	California quail	X	X	O	O	X	O*	O*	X	X	O*		X
Stellula calliope	calliope hummingbird	X	X	X	X	X	X	X		X	X		X
Spizella passerina	chipping sparrow	O*	X	X	X	X	X	O*		X	O*		X
Calypte costae	**Costa's hummingbird**	**O***	**X**	**O**	**O**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Passerella iliaca	fox sparrow	X	X	X	X	X	X	X		X	X	X	X
Zonotrichia atricapilla	golden-crowned sparrow	X	X	X	X	X	O*	O*		X	O*		X
Carpodacus mexicanus	house finch	O*	O*	O	O*	X	O*	O*	O*	X	O*	O*	O*
Vireo huttoni	Hutton's vireo	X	X	X	X	X	X	X		X	X	X	X
Carpodacus grammacus	lark sparrow	O*	O*	O	X	X	O*	O*	O*	X	O*		X
Carduelis lawrencii	**Lawrence's goldfinch**	**X**	**X**	**O**	**O**	**X**	**X**	**X**		**X**	**O***		**X**
Vireo bellii pusillus	**least Bell's vireo**	**X**	**X**	**X**	**X**		**X**	**X**			**X**	**X**	**X**
Carduelis psaltria	lesser goldfinch	O*	O*	O	O*	X	O*	O*	O*	X	O*	O*	X
Melospiza lincolnii	Lincoln's sparrow	X	X	X	X		X	X			O*	X	X
Anas platyrhynchos	mallard	X			X		X	X			X	X	
Sialia currucoides	mountain bluebird	X	X	X	X	X	X	X		X	X		X
Oreortyx pictus	mountain quail	X	X	X	X	X	O	X	X	X	X	X	X
Icterus galbula	northern oriole	X	X	X	X		X	X			X	X	X
Contopus cooperi	**olive-sided flycacther**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**O***		**X**
Phainopepla nitens	phainopepla	O	X	O	O*	X	O	X		X	O*		X
Parus inornatus	plain titmouse	X	X	X	X	X	X	X			X	X	X
Sphyrapicus ruber	red-breasted sapsucker	X	X	X	X	X	X	X		X	X		X
Stelgidopteryx ruficollis	rough-winged swallow	X	X	X	X		X	X			X	X	X
Selasphorus rufus	**rufous hummingbird**	**X**	**X**	**X**	**X**		**O***	**X**	**X**	**X**	**X**		**X**
Aimophila ruficeps	rufous-crowned sparrow	X	X	X	X	X	X	X		X	X		X
Pipilo erythrophthalmus	rufous-sided towhee	X	X	X	X	X	X	X		X	X		X
Melospiza melodia	**song sparrow**	**X**	**X**	**X**	**X**	**X**	**O***	**O***		**X**	**O***		**X**
Aimophila ruficeps canescens	**Southern California rufous-crowned sparrow**	**X**	**X**	**X**	**X**	**X**	**X**	**X**		**X**	**X**		**X**
Pipilo maculates	spotted towhee	O	O*	O	O*	X	O	O*		X	O*		X
Catharus ustulatus	Swainson's thrush						O	X			X	X	X
Tachycineta thalassina	violet-green swallow	X	X	X	X	X	X	X		X	X	X	X
Sialia mexicana	western bluebird	O	X	X	X	X	O	X		X	X		X
Piranga ludoviciana	western tanager	X	X	X	X	X	O	X		X	X		X
Aeronautes saxatalis	white-throated swift	X	X	X	X	X	X	X	X	X	X	X	X
Chamaea fasciata	wrentit	X	X	O	X	X	O	X	X	X	X		X
insertivores													
Anthus spinoletta	american pipit	X	X	O*	O*	X	X	X		X	X		X
Myiarchus cinerascens	ash-throated flycatcher	O	X	O	O	X	O	X	X	X	X		X
Hirundo rustica	barn swallow	X	X	X	X	X	X	X	X	X	X	X	X
Thryomanes bewickii	Bewick's wren	O	X	O	O*	X	O	O*	O*	X	X	O*	X
Sayornis nigricans	black phoebe	O	O*				X	O*			X	X	X
Dendroica nigrescens	black-throated gray warbler	X	X	X	X	X	X	O*	X	X	O*	X	X
Polioptila caerulea	blue-gray gnatcatcher	X	X	X	X	X	X	O*	X	X	X		X
Psaltriparus minimus	bushtit	O*	O*	O	O	X	O*	O*		X	O*	O*	X
Polioptila californica	California gnatcatcher	X	X	X	X	X	X	X	X	X	X		X

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Catherpes mexicanus	canyon wren	X	X	X	X	X	X	X	X	X	X		X
Tyrannus vociferans	Cassin's kingbird	X	X	O	X	X	X	X	X	X	X		X
Hirundo pyrrhonota	cliff swallow	X	X	X	X	X	X	X	X	X	X	X	X
Columbina passerina	common ground-dove	X	X	X	X	X	X	X	X	X	X		X
Phalaenoptilus nuttallii	common poorwill	X	X	X	X		X	X			X		X
Geothlypis trichas	common yellowthroat	X					X	X			X	X	X
Ammodramus savannrum	**grasshopper sparrow**	X	X	X	X	X	X	X	X	X	X		X
Tringa melanoleuca	greater yellowlegs	X					X	X			X	X	
Catharus guttatus	hermit thrush	X	X	X	X	X	X	X			X		X
Troglodytes aedon	house wren	O	O*	O	O	X	O	O*	X	X	O*		X
Charadrius vociferus	killdeer	X	X	X	X	X	X	X			X	X	X
Chordeiles acutipennis	lesser nighthawk	X	X	X	X	X	X	X	X	X	X		X
Cistothorus palustris	marsh wren	X					X	X			O*	X	
Zenaida macroura	mourning dove	O*	X	O*	O*	X	O*	O*	X	X	O*	O*	X
Vermivora ruficapilla	Nashville warbler	X	X	X	X		X	X			O*	X	X
Colaptes auratus	northern flicker	O*	X	X	O	X	O*	X		X	O*		X
Stelgidopteryx serripennis	northern rough-winged swallow	O	X	X	O*	X	O	O*	X	X	X	X	X
Picoides nuttallii	**Nuttall's woodpecker**	O	O*	X	O	X	O*	O*			O*		X
Baeolophus inornatus	**oak titmouse**	X	X	X	X	X	X	O*			O*		X
Vermivora celata	orange-crowned warbler	O	X	O	O		X	X			O*	X	X
Empidonax difficilis	Pacific-slope flycatcher	X	X	X	X	X	O	X			X		X
Agelaius phoeniceus	red-winged blackbird	X					X	X			X		
Salpinctes obsoletus	rock wren	O*	X	X	O*		X	X			X		X
Regulus calendula	ruby-crowned kinglet	X	X	X	X	X	O*	X		X	O*		X
Oreoscoptes montanus	sage thrasher	X	X	X	X	X	X	X			X		O*
Sayornis saya	Say's phoebe	X	X	X	X	X	X	X	X	X	X		X
Empidonax traillii extimus	**southwestern willow flycatcher**						X	X			X	X	
Agelaius tricolor	**tri-colored blackbird**	X					X	X			X	X	
Vireo gilvus	warbling vireo	X					X	X			O*	X	
Anthus spinoletta	water pipit	X					X	X			X	X	
Sturnella neglecta	western meadowlark	O*	X	O*	O*	X	O*	O*	O*	X	X		X
Contopus sordidulus	western wood-pewee	X	X	X	X	X	X	X			X		X
Sitta carolinensis	white-breasted nuthatch	X	X	X	X	X	X	X		X	O*		X
Dendroica petechia	**yellow warbler**	O	O*				X	X			O*	X	X
Sphyrapicus varius	yellow-bellied sapsucker	X	O*	X	X	X	X	X			X		X
Icteria virens	**yellow-breasted chat**	X	X	X	X	X	X	X	X	X	X		X
omnivores													
Melanerpes formicivorus	acorn woodpecker	X	X	X	X	X	X	X			O*		X
Corvus brachyrhynchos	American crow	X	X	O	X	X	O	X			X		X
Passerculus sandwichensis beldingi	**Belding's savannah sparrow**	X					X	X			X		
Amphispiza belli belli	**Bell's sage sparrow**	X		X									
Euphagus cyanocephalus	Brewer's blackbird	X	X	X	X	X	X	X		X	X		X
Molothrus aster	brown-headed cowbird	X	X	X	X	X	X	X		X	X		X
Passerculus sandwichensis alaudinus	**Bryant's savannah sparrow**	X					X	X			X		
Toxostoma redivivum	California thrasher	O*	O*	O*	O*	X	O*	O*	O*	X	O*		X
Pipilo crissalis	California towhee	O			O		X	X			X	X	
Corvus corax	common raven	O	X	X	O	X	O	X			X		X
Junco hyemalis	dark-eyed junco						X	O*			O*		
Picoides pubescens	downy woodpecker	O		X	X		O	X			X		
Sturnus vulgaris	European starling	O*	O*	X	O	X	O*	O*			O*		X
Geococcyx californianus	greater roadrunner	X	X	X	X	X	O	X	X	X	X	X	X
Picoides villosus	hairy woodpecker	X		X	X		X	X			X		X
Passer domesticus	house sparrow	O	X	X	X	X	X	X	X	X	O*	X	X
Passerculus sandwichensis rostratus	**large-billed savannah sparrow**	X					X	X			X	X	
Passerina amoena	lazuli bunting	O		X	O	X	O	X	X	X	X	X	X
Melanerpes lewis	**Lewis' woodpecker**	X		X	X		X	X			X		X
Mimus polyglottos	northern mockingbird	X	X	X	X	X	X	X		X	X		X
Columba livia	rock dove	X	X	X	X	X	X	O*		X	X		X
Amphispiza belli	sage sparrow	X	X	X	X	X	X	X	O*	X	X		X
Passerculus sandwichensis	savannah sparrow	X	O*		O*		O*	X			O*		

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Pooecetes gramineus	vesper sparrow	X	X	X	X	X	O*	X	X	X	X		X
Tyrannus verticalis	western kingbird	X	X	O	X	X	X	X		X	X		X
Aphelocoma californica	western scrub-jay	X		X	X	X	O	X	X	X	O*		X
Zonotrichia leucophrys	white-crowned sparrow	O*	X	O*	O*	X	O*	O*	O*	X	O*		X
Wilsonia pusilla	Wilson's warbler	O	O	O	O		X	X			X		
Dendroica coronata	yellow-rumped warbler	O*	O*	X	X		O*	O*			O*	X	X
carnivores													
Falco sparverius	American kestrel	O*	X	X	O	X	X	X	X	X	X		X
Falco pregrinus	**American peregrine falcon**						X	X				X	
Pelecanus erythrorhynchos	American white pelican (not nesting)						X	X			O*		
Tyto alba	barn owl	X			O		O*	X			X		
Athene cunicularia	**burrowing owl**	O	X	X	X	X	X	X		X	X		X
Accipiter cooperii	**Cooper's hawk**				O		O	X			X		
Buteo regalis	**ferruginous hawk**	X	X	X	X	X	X	X			X		X
Aquila chrysaetos	**golden eagle**	O*	X	X	X	X	X	X	X	X	X		O*
Bubo virginianus	great horned owl				O		X	X			X		
Lanius ludovicianus	**loggerhead shrike**	X	X	O*	O*	X	X	X			X		X
Asio otus	**long-eared owl (nesting)**			X			X	X			X		X
Falco columbarius	**merlin**	X	X	X	X	X	X	X			X		X
Circus cyaneus	**northern harrier**	X	X	X	X	X	X	X			X		X
Falco mexicanus	**prairie falcon**	X	X	X	O*	X	O	X		X	X		X
Buteo lineatus	red-shouldered hawk	O					X	X			X	X	X
Buteo jamaicensis	red-tailed hawk	O*	X	X	O	X	O*	O*	O*	X	O*		X
Accipiter striatus	**sharp-shinned hawk**						X	X			X	X	X
Asio flammeus	**short-eared owl (nesting)**	X	X	X	X	X	X	X		X	X		X
Buteo swainsonii	**swainson's hawk**	X	X	X	X	X	X	X		X	X		X
Cathartes aura	turkey vulture	X	X	X	X	X	X	X	X	X	X	X	X
Otus kennicottii	western screech owl						X	X			X		X
Plegadis chihi	**white-faced ibis**	X					X	X			X		
Elanus caerulus	**white-tailed kite**	O	X	O	X	X	O	O		X	O		O
MAMMALS													
small herbivores													
Chaetodipus fallax	Dulzura pocket mouse	O*	X	X	O*	X	O*	O*	X	X	O*	O*	X
Chaetodipus fallax fallax	**San Diego pocket mouse**	X	X	X	X	X	X	X	X	X	X	X	X
Dipodomys agilis	Pacific kangaroo rat	X	X	X	X	X	X	X	X	X	X	X	X
Dipodomys merriami parvus	**San Bernardino kangaroo rat**	X	X	X	X	X	X	X	X	X	X	X	X
Dipodomys simulans	Dulzura kangaroo rat	O*	O*	O	O*	O	O*	O*	O*	O	O*	O*	O
Dipodomys stephensi	**Stephens' kangaroo rat**	O*	O	O	O	X	O*	O*	O	X	O		O
Lepus californicus	black-tailed jackrabbit	O	O	O	O	O	O	O	O	O	O		O
Lepus californicus bennettii	**San Diego black-tailed jackrabbit**	X	X	O	X	X	X	X	X	X	X	X	X
Mus musculas	house mouse		X				X						X
Neotoma lepida	desert woodrat	X	X	X	X	X	X	O	X	X	X	X	X
Neotoma lepida intermedia	**San Diego desert woodrat**	X	X	X	X	X	X			X	X		X
Neotoma macrotis	big-eared woodrat		X	X	X		O*	X			X	X	X
Perognathus longimembris brevinasus	**Los Angeles pocket mouse**	X	X	X	X	X	X	X	X	X	X	X	X
Peromyscus maniculatus	deer mouse	O	X	O	X	X	O*	O*	O*	X	X	X	X
Peromyscus boylii	brush mouse	X	X	X	X	X	X	X	X	X	X	X	X
Peromyscus californicus	California mouse	X	X	X	X	X	O*	O*	X	X	O*	O*	X
Peromyscus eremicus	cactus mouse	X	X	X	X	X	O*	O*	O*	X	X	X	X
Reithrodontomys megalotis	western harvet mouse	O	X	X	X	X	O*	O*	X	X	O*	X	X
Spermophilus beecheyi	California ground squirrel	O	O	O	O	O	O	X	X	X	O		O
Sylvilagus audubonii	desert cottontail	O	O	O	O	O	O	X	X	X	O		O
Sylvilagus bachmani	brush rabbit		X	X	X		X	X			X		X
small insectivores													
Antrozous pallidus	**pallid bat**	X	X		O		O	X			O	X	X
Eptesicus fuscus	big brown bat	X	O	X	X		X	X			X	X	X
Eumops perotis	**western mastiff bat**	X	X	X	X		O	X			O	X	X
Lasiurus blossevillii	**western red bat**	X	X	X	X		O	X			O	X	X
Myotis ciliolabrum	**small-footed myotis**	X	X	X	X		O	X			O	X	X

Species Groups and Species		Operational Area											
Scientific name	Common Name	A	B	C	D	E	F	G	H	I	Conservation Easement (outside OAs)	Lower Massacre Canyon	Other Areas Outside of OAs
Myotis yumanensis	**Yuma myotis**	X	X	X	X		O	X			O	X	X
Nyctinomops femerosaccus	**pocketed free-tailed bat**	X	X	X	X		O	X			O	X	X
Thomomys bottae	Botta's pocket gopher	O	O	O	O	X	O	X	O	O	O		O
large herbivores													
Bos taurus	domestic cattle		O	O	O						O		O
Odocoileus hemionus	mule deer	O*	O	O	O	O	O	O*	O	O	O	X	O
carnivores													
Bassariscus astutus	ringtail		X		X		X	X			X	X	
Canis familiaris	domestic dog	O	O										
Canis latrans	coyote	O	O	O	O	O	O	O	O	O	O	X	O
Felis rufus	bobcat	O*	O*	O*	O*	X	O	O*	O*	O	O*	X	O
Mustela frenata	long-tailed weasel	X	X	X	X		X	X			X		
Onychomys torridus ramona	**southern grasshopper mouse**	X	X	X	X	X	X	X	X	X	X		X
Procyon lotor	raccoon	O*	X	X	X	X	X	O*			X		X
Puma concolor	mountain lion (foraging only)	X	X	X	X	X	X	X	X	X	X	X	X
Taxidea taxus	**American badger**	X	X	X	X	X	X	X	X	X	X		X
Urocyon cinereoargenteus	gray fox	X	X	X	X	X	X	X	X	X	X	X	X

O = Observed (or detected by sign) at the Site

O* = Observed (or detected by sign) during surveys conducted in Fall 2008

X = potentially inhabits the Site

Habitat Key for Site 1

Habitat	Includes the following plant communities from Keeler-Wolfe MSHCP mapping
Grassland (including small areas with tree overstory)	agricultural mapping unit (1), California annual grassland alliance (4), coast live oak/annual grass-herb association (18), exotic trees mapping unit (21)
Scrubs (including coastal sage scrubs)	Brittlebush-California buckwheat mapping unit (2), California buckwheat-sugarbush association (5), California buckwheat - white sage mapping unit (6), California buckwheat alliance (7), California sagebrush - California buckwheat mapping unit (8), Disturbed shrub and herb coastal sage scrub unit (20), Interior live oak shrub alliance (27), scalebroom (California buckwheat-Mexican elderberry-mulefat) mapping unit (30), scalebroom-California buckwheat association (31), Scalebroom - mulefat association (32), scalebroom/Menzies' fiddleneck association (33), sugar bush alliance (38), yerba santa alliance (44)
Chamise/Chaparral	chamise - bigberry manzanita mapping unit (10), chamise - bigberry manzanita alliance (11), Chamise-black sage alliance (12), Chamise-coastal sage scrub disturbance mapping unit (13), Chamise-cupleaf ceanothus alliance (14), Chamise-hoaryleaf ceanothus alliance (15), chamise alliance (16), chamise pure association (17), coast live oak/chaparral association (19), scrub oak - chamise alliance (34), scrub oak - southern mixed chaparral association (35), toyon - scrub oak - birchleaf mountain-mahogany - California sh association (39), toyon alliance (40)
Wash - open water component	bulrush-cattail alliance (3), Fremont cottonwood-black willow/mulefat association (22), Fremont Cottonwood-Red Willow association (23), Fremont cottonwood-willow mapping unit (24), Fremont cottonwood/mulefat association (25), willow mapping unit (43), open water (50) - where surface water is present
Wash - dry	California sycamore alliance (9), Fremont cottonwood dry mapping unit (26)

Operations Area Key for Site 1

Operational Area
A
B
C
D
E
F
G
H
I
Conservation Easement outside of OAs
Lower Massacre Canyon west of OAs
Other areas outside of OAs