NATURAL RESOURCES ASSESSMENT, INC.

San Bernardino Kangaroo Rat (*Dipodomys merriami parvus*) Presence/Absence Trapping Studies Cajon Boulevard Warehouse Project San Bernardino, California

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CERTIFICATION

This Phase One Survey and report were conducted and prepared in accordance with professional requirements for small

mammal trapping studies by Philippe Vergne (USFWS Permit TE068072-3).

Philippe Jean Vergne, Field Biologist and Author.

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1.0 Introduction

Natural Resources Assessment, Inc. (NRAI) was contracted by L&L Environmental, Inc. to conduct a habitat assessment and live-trapping effort for the federally listed endangered San Bernardino kangaroo rat (*Dipodomys merriami parvus*). The study was conducted on an estimated 20-acre site located in the Devore area of the city San Bernardino, San Bernardino County, California.

This report describes the existing conditions of the project site, the general biological resources observed on site, and the results of the trapping studies. The assessment and trapping work were required to determine the presence or absence of the San Bernardino kangaroo rat (SBKR) on the property.

2.0 Site Location and Project Description

The survey area discussed in this report is located adjacent to the northwestern most limits of the City of San Bernardino, between the 5th and 6th Wards on a narrow band of San Bernardino County land that juts into the City of San Bernardino (Figure 1).

The survey area is located in Section 2m Township 1 North, Range 5 West in San Bernardino County, California, San Bernardino baseline and meridain (Figure 2). This location is shown on the Devore, California 7.5-minute U. S. Geological Survey (USGS) quadrangle (Devore, 1988). The Assessor's Parcel Numbers (APNs) are 026-204-109, 026-204-113, 026-204-118, and 026-204-120.

The proposed project is for construction and operation of a warehouse.

3.0 Methods

A literature review and records check was conducted for sensitive resources within the vicinity of the proposed project. In addition to the literature review, a general field survey of the project area was conducted. The field survey provided information on the existing conditions of the site and the potential for sensitive resources to be present. Trapping surveys for SBKR were conducted in areas containing potential SBKR habitat.

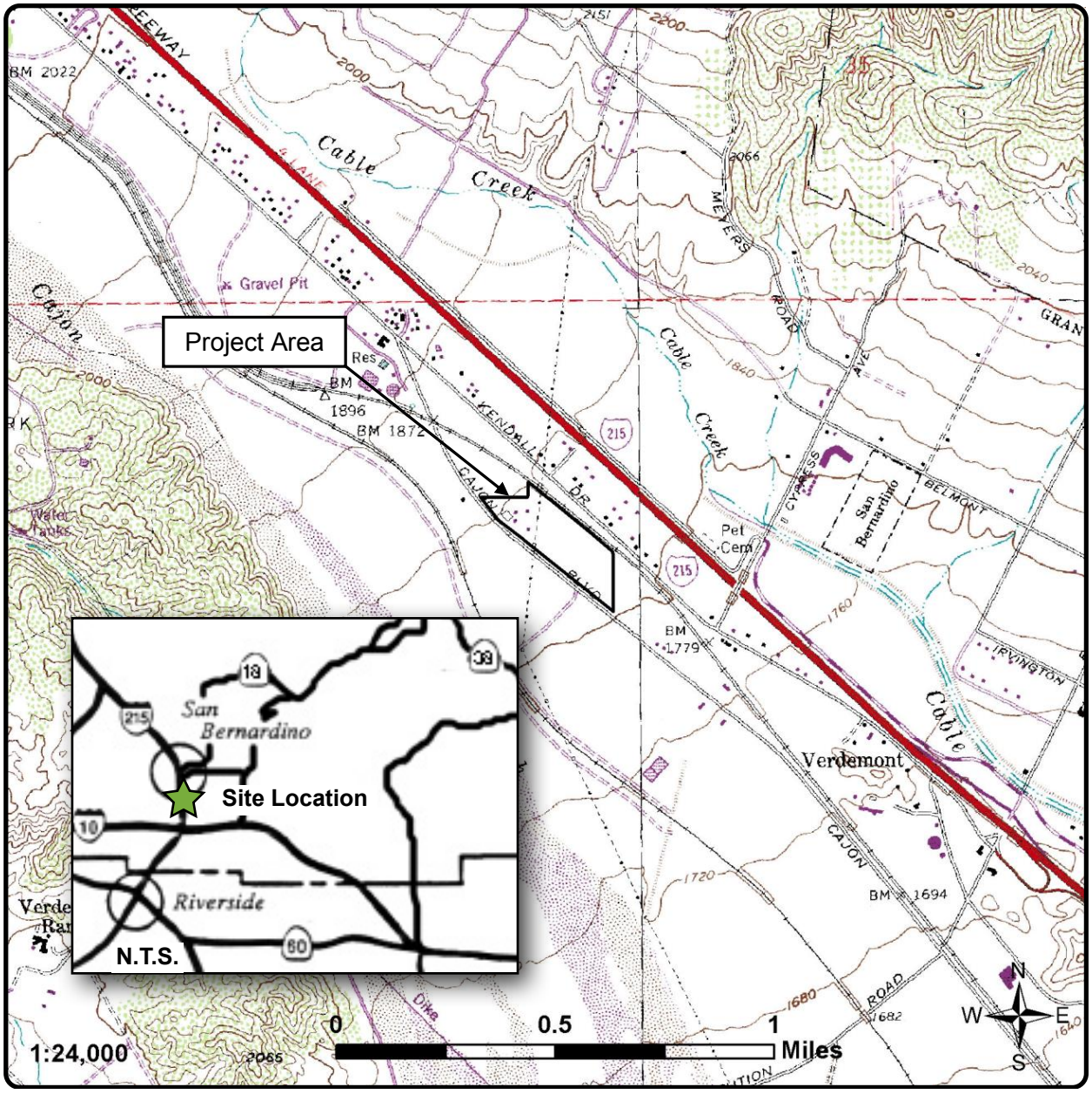
3.1 Literature Review and Records Check

The literature review and records check included a review of standard field guides and texts on sensitive and non-sensitive biological resources potentially onsite, as well as the following sources:

- List of sensitive biological resources provided by the California Natural Diversity Data Base (CNDDB).
- *The Status and Known Distribution of the San Bernardino Kangaroo Rat (*Dipodomys merriami parvus*). Field surveys conducted between 1987 and 1996* (McKernan 1997).
- Endangered and Threatened Wildlife and Plants; Final Rule to List the San Bernardino Kangaroo Rat as Endangered; and Notice of Public Hearing (U. S. Fish and Wildlife Service 1998).

3.2 Habitat Evaluation Surveys

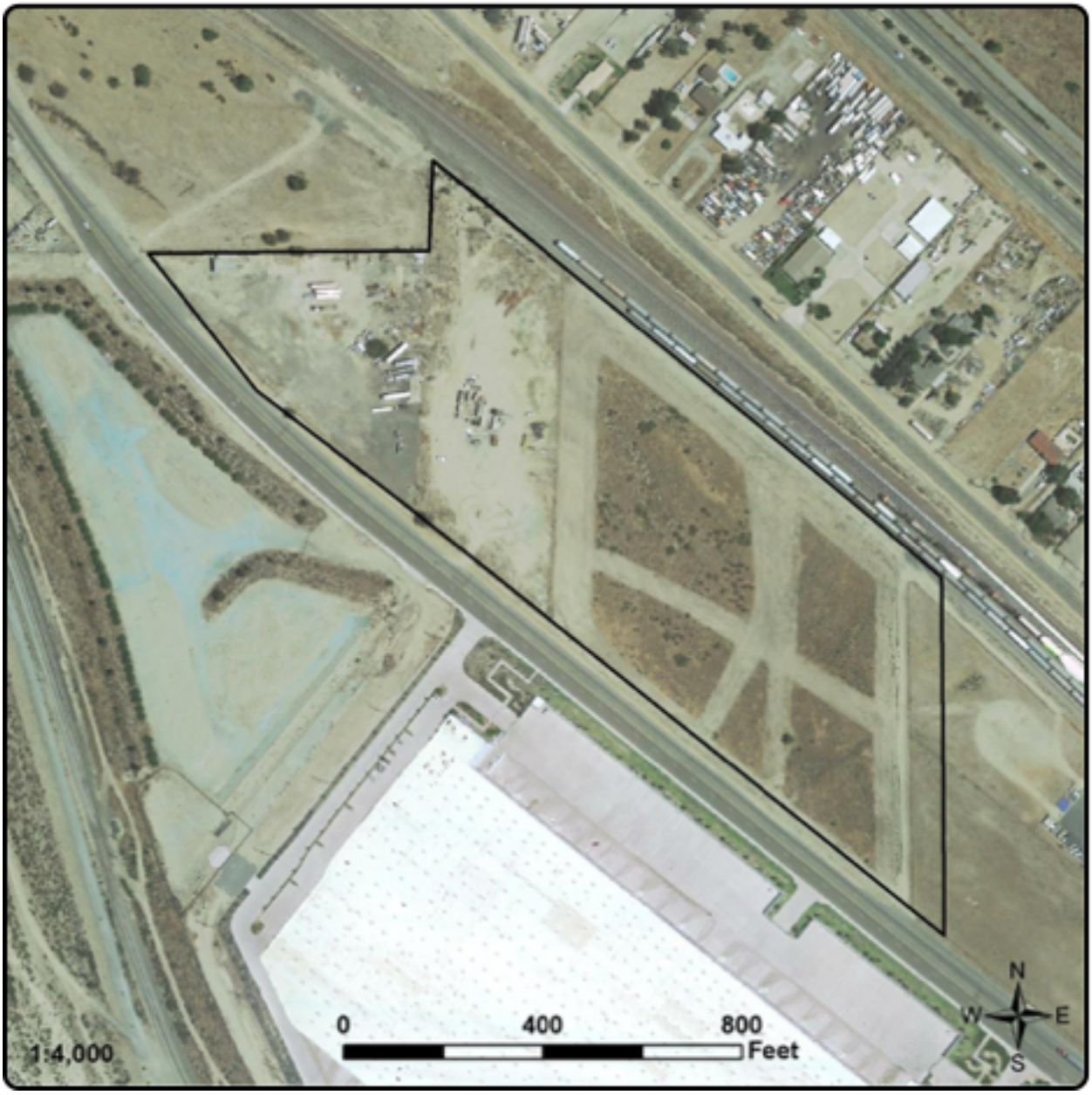
Mr. Philippe Vergne, a certified kangaroo rat biologist holding U.S. Fish and Wildlife Permit No. TE831207-4 and current California Department of Fish and Wildlife (CDFW) Memorandum of Understanding, inventoried and evaluated the condition of the soils and plant communities on site in order to assess the potential trapping locations for SBKR or other sensitive species. Mr. Vergne took notes during the surveys of all plant and animal species observed.



Map Base: Devore USGS topographic quadrangle (1988).

Figure 1. Property Location and Original Topography

Map courtesy of L&L Environmental, Inc.



Source: Google Earth 2017

Figure 2. Property Aerial Showing 2017 Property Conditions

Map courtesy of L&L Environmental, Inc.

An intensive search was conducted in all potential habitat areas for such diagnostic kangaroo rat sign as habitat, scat, tracks, dust bowls and burrows (Photo 1). All species identified by sight, call or sign (burrows, scat, tracks, etc.) and visual observation were recorded. Mr. Vergne identified sign belonging to one or more kangaroo rat species.

Photo 1. Dulzura kangaroo rat burrow on site.

In addition, site characteristics such as soils, topography, the condition of the plant communities, and evidence of human use of the site were noted. A list of plant and wildlife species observed during the survey is included in Appendix A.

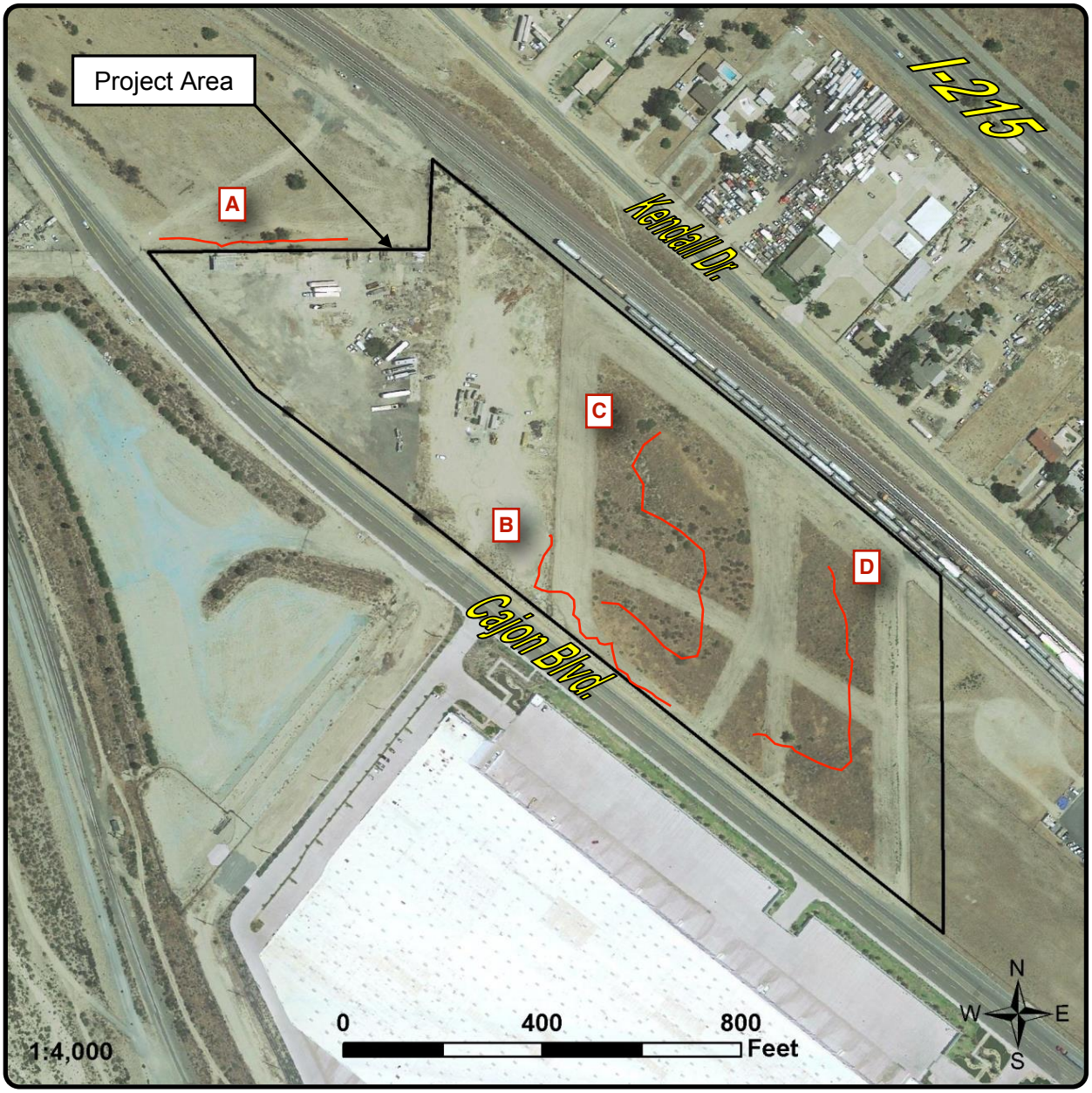
3.3 San Bernardino Kangaroo Rat Trapping Surveys

The current trapping surveys for SBKR were conducted according to U.S. Fish and Wildlife Service (USFWS) protocols established for SBKR. The current protocol calls for five nights of trapping, preferably during a new moon phase. One trapping session was conducted from April 5 to 9, 2018.

Five areas on the property were trapped. Trapping lines of 20-40 traps, set 12 meters apart, were set in trapping areas A through D (Figure 3). Traps were placed in areas containing sandy loam soils showing sign of small mammal use.

Each trap was baited with birdseed placed at the back of the traps. The traps were left in place each day. Each trap was set at dusk each night and inspected once during the night and at dawn each morning. All animals were identified and released at the point of capture.

Notes were taken on the habitat conditions where the traps were placed. Weather conditions at the time of the trapping were also noted.



Source: Google Earth 2017

Figure 3. Trapline Locations

Trapline

Map courtesy of L&L Environmental, Inc.

4.0 Results

Four sensitive mammal species were identified as potentially present in the vicinity of the project site: the San Bernardino kangaroo rat, northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), and San Diego desert woodrat (*Neotoma lepida intermedia*).

Of the animal species potentially present, only the San Bernardino kangaroo rat requires specific survey protocols to establish presence or absence. These specific survey protocols are required for areas where impacts may occur to the sensitive species or their occupied habitat. The remaining species are usually identified through casual observation or as part of the overall trapping effort.

4.1 Sensitive Biological Resources

4.1.1 San Bernardino Kangaroo Rat

The San Bernardino kangaroo rat is primarily associated with a variety of sage scrub vegetation, where the common elements are the presence of sandy soils and relatively open vegetation structure (McKernan 1997). Flood events break out of the main river channel in a complex pattern, resulting in a braided appearance to the flood plain. This dynamic nature to the habitat leads to a situation where not all the alluvial scrub habitat is suitable for the kangaroo rat at any point in time.

The SBKR prefers open habitat characterized by a low stature open scrub canopy cover of less than 22 percent. Occupied SBKR habitat also typically exhibits a reduced herbaceous cover with a low abundance of European grasses, such as brome species. This type of habitat is best described as early to intermediate phase alluvial sage scrub communities that are subject to frequent flooding/scouring. The open vegetation structure in these communities support the highest densities of SBKR.

Mature phase alluvial chaparral, which are usually located above the active channel or on higher benches are not usually occupied by SBKR, although individuals have been trapped in dense upland scrub adjacent to open habitat and SBKR populations (Vergne 2008).

4.1.2 Northwestern San Diego Pocket Mouse

The northwestern San Diego pocket mouse prefers habitat similar to that preferred by the SBKR. The northwestern San Diego pocket mouse occurs in open, sandy areas in the valleys and foothills of southwestern California.

The range of this species extends from Orange County to San Diego County, and includes Riverside and San Bernardino counties. This mouse is a California Species of Concern (CSC) whose historical range has been reduced by urban development and agriculture.

4.1.3 Los Angeles Pocket Mouse

The Los Angeles pocket mouse is one of two pocket mice found in this area of San Bernardino County. Both the Los Angeles pocket mouse and the San Diego pocket mouse occupy similar habitats, but the San Diego pocket mouse has a wider range extending south into San Diego County. The habitat of the Los Angeles pocket mouse is described as being confined to lower elevation grasslands and coast sage scrub habitats, in areas with soils composed of fine sands (Williams, 1986). The present known distribution of this species extends from Rancho Cucamonga east to Morongo Valley and south to the San Diego County border.

Los Angeles pocket mouse forages in open ground and underneath shrubs. Pocket mice dig burrows in loose soil, although this has not been completely documented for this subspecies.

The L.A. pocket mouse is listed as a California Species of Concern by the California Department of Fish and Wildlife (CDFW).

4.2 Soils and Topography

Soils data for the survey area were obtained from the U. S. Department of Agriculture, Natural Resource Conservation Service and Soil Survey Geographic (SSURGO) Database. The survey area is a mixture of Soboba gravelly loamy sand (0-9% slopes) and Tujunga gravelly loamy sand (0-9% slopes, Figure 4). The majority of the survey area is characterized as Tujunga gravelly loamy sand.

Located on a slightly raised bench within the historic flood plain between Cajon Wash and Cable Creek, the survey area is relatively flat with a slight slope that drops downward to the southeast. Soils observed within the developed portion of the site were compacted or had imported gravel. The undeveloped area soils were compacted where there are roadways cut across the site but appeared sandy in less disturbed areas and adjacent to the railroad tracks to the north and east.

4.3 Land Uses

The survey area is located between Cajon Boulevard to the southwest and the railroad tracks, with Kendall Drive just beyond to the northeast. It is generally bounded to the northeast and southwest by commercial and industrial development with Cajon Wash beyond to the southwest. Undeveloped disturbed land is immediately adjacent to the site to the northwest and southeast with industrial and commercial land beyond.

4.4 Plant Communities

Three vegetation types currently exist in the survey area. In order of decreasing importance they are: un-vegetated/developed areas, disturbed alluvial fan sage scrub, and Alluvial Fan Sage Scrub (AFSS) (Photos 2, 3 and 4).

Photo 2. Scrub/grassland habitat in the southeast portion of the property.

Photo 3. Disturbed habitat in the southeastern portion of the property. Looking northeast.

Photo 3. Developed portion of the property. Looking northwest.

4.5 Wildlife

Wildlife activity was low during the trapping surveys. One reptile species, the side-blotched lizard (*Uta stansburiana*) was observed. Bird species observed included mourning dove (*Zenaida macroura*), ravens (*Corvus corax*) and American kestrel (*Falco sparverius*).

A list of species observed is given in Appendix A.

4.6. San Bernardino Kangaroo Rat Trapping Surveys

4.6.1 Weather Conditions

Weather conditions during the trapping surveys included morning temperatures in the mid sixties to low seventies degrees Fahrenheit, with clear to partly cloudy skies and winds of less than five miles per hour. With night/early morning fog occurring on one day of the survey period. The moon was new during the protocol survey. Daily weather conditions for each day are summarized in Table 1 below.

Table 1. Weather Summary

Date	Cloud Cover	Morning Temperatures (F)	Wind Speed (miles per hour)
April 5, 2018	Clear	53	0
April 6, 2018	Clear	54	0
April 7, 2018	Clear	55	0-3
April 8, 2018	Fog	55	0
April 9, 2018	Clear	54	0

4.6.2 Trap Site Descriptions

Traps were set within open areas on sites that had small fossorial mammal sign or that were near less disturbed areas adjacent to the property.

4.6.3 Trapping Survey Results

Trapping success was low over the entire trapping period. A total of four small mammal species were trapped during the survey period. Table 2 provides summary information on the species trapped per trapping location.

Table 2. Trapping Results for the Cajon Boulevard Warehouse Development

		Dulzura Kangaroo Rat	Cactus Mouse	Deer Mouse	Los Angeles Pocket Mouse
Trap Site	Number of Trap Nights	*Dipodomys simulans*	*Peromyscus eremicus*	*Peromyscus maniculatus*	*Perognathus longimembris brevinasus*
A	80	2	1	4	0
B	125			3	1
C	150	11	2	7	3
D	150	14		6	0
Totals	**505**	**27**	**3**	**20**	**4**

5.0 Discussion

SBKR were not captured during the protocol survey. Based on survey results, the SBKR does not currently occur on site and project implementation will have no direct impacts to the SBKR.

One sensitive mammal species, the Los Angeles pocket mouse, was captured during the focused survey. Impacts to this species from project implementation are not considered to be significant on a regional scale.

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Appendix A - Plant and Animal Species Observed

* denotes non-native plant species

Plants

ANGIOSPERMAE: DICOTYLEDONES	DICOT FLOWERING PLANTS
Asteraceae	**Sunflower family**
Artemisia californica	California sagebrush
Helianthus annuus	Annual sunflower
Heterotheca grandiflora	Telegraph weed
Boraginaceae	**Borage family**
Amsinckia menziesii	Fiddleneck
Brassicaceae	**Mustard family**
**Hirschfeldia incana*	Short-podded mustard
Cactaceae	**Cactus family**
Opuntiasp.	Cholla
Chenopodiaceae	**Saltbush family**
**Salsola tragus*	Russian thistle
Euphorbiaceae	**Spurge family**
Croton californica	Croton
Croton setigerus	Doveweed
Fabaceae	**Pea family**
Lotus scoparius	Deer weed
Lupinus bicolor	Miniature lupine
Hydrophyllaceae	**Waterleaf family**
Eriodictyon trichocalyx	Yerba santa
Polygonaceae	**Buckwheat family**
Eriogonum fasciculatum	California buckwheat
Eriogonum gracile	Graceful buckwheat
Rosaceae	**Rose family**
Adenostoma fasciculatum	Chamise
Cercocarpus betuloides	Mountain mahogany
Poaceae	**Grass family**
**Bromus diandrus*	Ripgut brome
**Bromus tectorum*	Cheatgrass
**Cenchrus* sp.	Sandbur
**Schismus barbatus*	Mediterranean grass

Taxonomy and nomenclature follow Baldwin & Goldman 2012 and Munz 1974.

Animals

REPTILIA	**REPTILES**
Iguanidae	**Iguanas and their allies**
Uta stansburiana	Side-blotched lizard
Colubridae	**Colubrids**
Masticophis flagellum	Coachwhip
AVES	**BIRDS**
Charadriidae	**Plovers and relatives**
Charadrius vociferus	Killdeer
Cathartidae	**Vultures**
Cathartes aura	Turkey vulture
Accipitridae	**Kites, hawks and eagles**
Buteo lineatus	Red-shouldered hawk
Falconidae	**Caracaras and falcons**
Falco sparverius	American kestrel
Phasianidae	**Quails and pheasants**
Callipepla californica	California quail
Columbidae	**Pigeons and doves**
Columba livia	Rock dove
Zenaida macroura	Mourning dove
Tytonidae	**Barn owl**
Tyto alba	Barn owl
Emberizidae	**Warblers, sparrows, blackbirds and relatives**
Zonotrichia leucophrys	White-crowned sparrow
MAMMALIA	**MAMMALS**
Leporidae	**Rabbits and hares**
Sylvilagus audubonii	Audubon's cottontail
Sciuridae	**Squirrels, chipmunks and marmots**
Spermophilus beecheyi	California ground squirrel
Geomyidae	**Pocket gophers**
Thomomys bottae	Botta's pocket gopher

Heteromyidae	**Pocket mice and kangaroo rats**
Perognathus longimembris brevinasus	Los Angeles pocket mouse
Dipodomys simulans	Dulzura kangaroo rat
Cricetidae	**Cricetine mice and rats**
Peromyscus eremicus	Cactus mouse
Peromyscus maniculatus	Deer mouse
Canidae	**Foxes, wolves and relatives**
Canis latrans	Coyote

Nomenclature follows California Department of Fish and Wildlife 2016 and Stebbins 1966.