Appendix B-1

California Department of Fish and Game Mohave Ground Squirrel Guideline Report, Proposed Oeste Recharge Basin Project

Randel Wildlife Consulting, Inc

June 2023

CALIFORNIA DEPARTMENT OF FISH AND GAME
MOHAVE GROUND SQUIRREL
(*XEROSPERMOPHILUS MOHAVENSIS*)
GUIDELINE
SURVEY REPORT

PROPOSED OESTE RECHARGE BASIN PROJECT
SAN BERNARDINO COUNTY, CALIFORNIA

Prepared By:
RANDEL WILDLIFE CONSULTING, INC.
South Pasadena, California

June 2023
(RWC File No. 156–0001)

Prepared For:
Mojave Water Agency
13846 Conference Center Dr
Apple Valley, CA 92307

TABLE OF CONTENTS

TABLE OF CONTENTS i
LIST OF FIGURES i
INTRODUCTION 1
Project Location 1
Mojave Ground Squirrel 1
Survey Location 4
MGS Survey Grid: Soil Description 4
Site Reconnaissance / Habitat Assessment 5
Focused Surveys: Mohave ground squirrel 5
RESULTS 9
Site Context 9
Focused Surveys 9
LITERATURE CITED 10
APPENDIX A –REPRESENTATIVE SITE PHOTOGRAPHS ..... A
APPENDIX B –WEATHER SUMMARY ..... B
APPENDIX C – WILDLIFE SPECIES OBSERVED C

LIST OF FIGURES

Figure 1 – Regional Vicinity 2
Figure 2 – Local Vicinity 3
Figure 3 – Mohave Ground Squirrel Distribution 6
Figure 4 – Mohave Ground Squirrel Survey Location 7
Figure 5 – Soil Types 8

INTRODUCTION

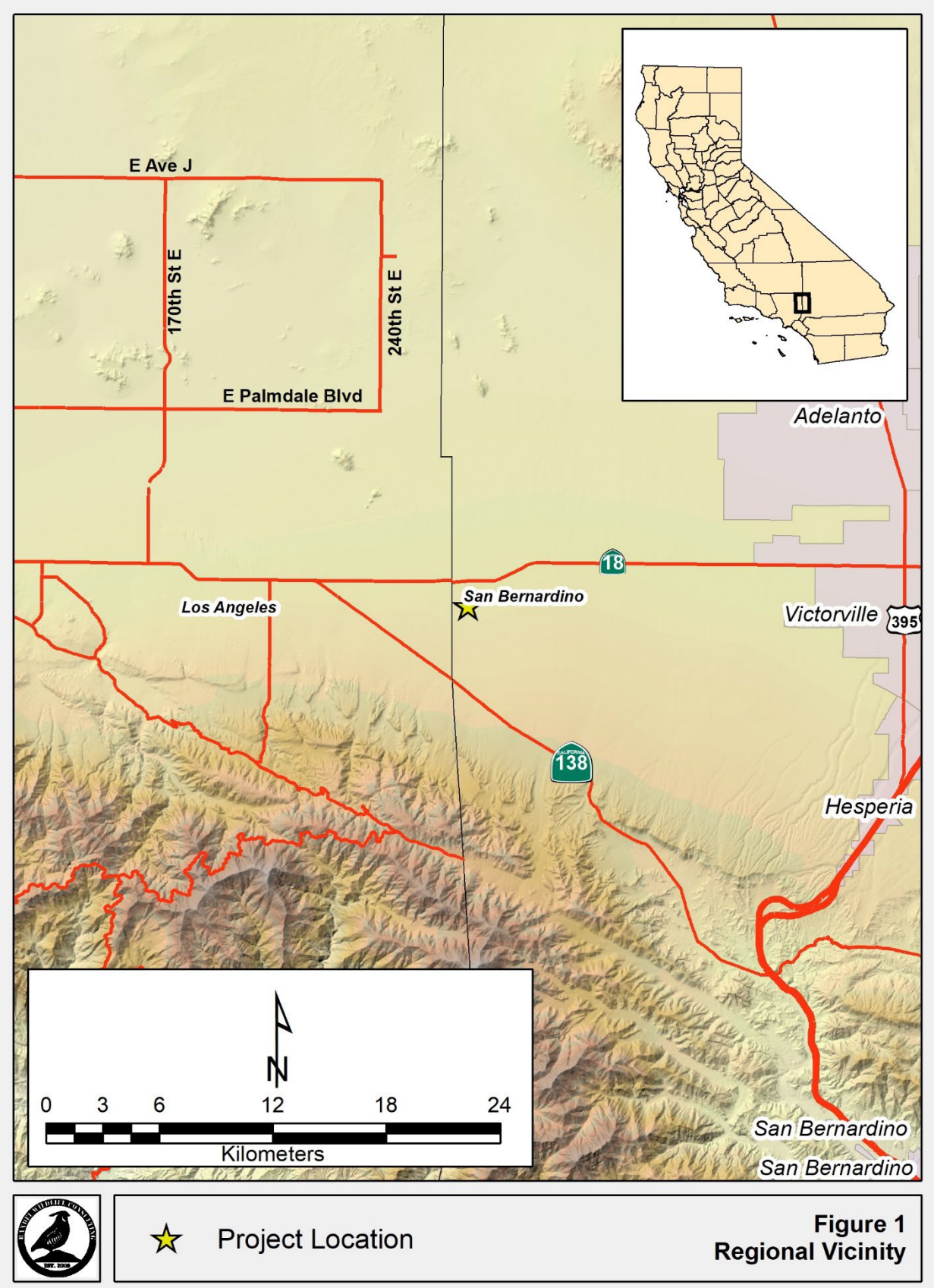
This report presents the results of focused Mohave ground squirrel (MGS; *Xerospermophilus mohavensis*) surveys on the proposed Oeste Recharge Basin Project, census designated Pinon Hills area, unincorporated San Bernardino County, California (Figure 1). Mohave ground squirrel focused surveys were conducted in accordance with California Department of Fish and Wildlife (CDFW) guidelines (CDFW 2003) and authorized by CDFW under Memorandum of Understandings between CDFW and Randel Wildlife Consulting, Inc. The purpose of this study was to determine the presence or absence of the California threatened Mohave ground squirrel within the proposed 10-acre Oeste Recharge Basin Project, located in the census designated Pinon Hills area, unincorporated San Bernardino County, California (Figure 2) pursuant to requirements outlined by the California Environmental Quality Act and California Endangered Species Act.

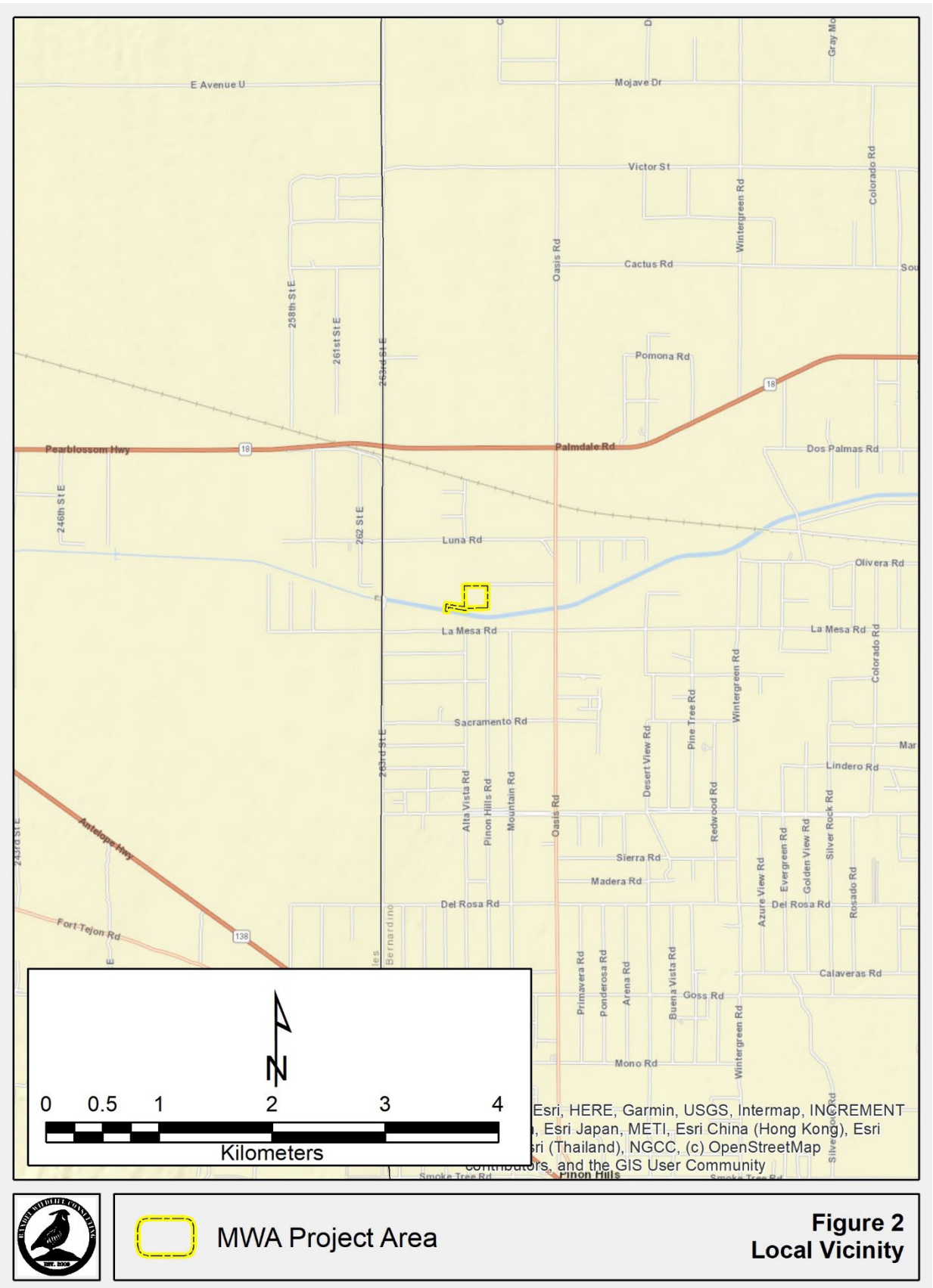
Project Location

The proposed Oeste Recharge Basin Project is located on single parcel (APN: 3099-08-101-0000) with an approximate area of 10-acres of undeveloped land at the terminus of Cayucos Rd, Pinon Hills, California. The project is located in the southwestern portion of San Bernardino County, in the geographic sub-region of the southwestern Mojave Desert. The project site is located at the terminus of Cayucos Rd and is accessible via Oasis Rd from either State Route 18 (SR-18) in the north or State Route (SR-138) in the south. The subject property is further described by the Public Land Survey System as being within the northeast ¼ of the southwest ¼ of the southeast ¼ of Section 30, Township 5 North, and Range 7 West.

Mojave Ground Squirrel

Mohave ground squirrel are small, diurnal ground squirrels endemic to the western Mojave Desert, occupying portions of Los Angeles, Kern, Inyo, and San Bernardino counties (Best 1995); with a historic distribution estimated at approximately 7,812 square miles from the eastern slopes of the Transverse and Sierra Nevada mountain ranges in the west to the Mojave River in the east, and from Owens Lake in the north to Palmdale in the south (Figure 3; Best 1995, Leitner 2008).


E Ave J
170th St E
240th St E
E Palmdale Blvd
Adelanto
18
San Bernardino
Los Angeles
Victorville
395
138
Hesperia
0 3 6 12 18 24
Kilometers
San Bernardino
San Bernardino
Project Location
Figure 1
Regional Vicinity



MWA Project Area

Figure 2
Local Vicinity

Mohave ground squirrel occupy desert scrub habitat associations with creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and saltbush (*Atriplex* sp.) dominant or co-dominant at lower elevations and Joshua tree (*Yucca brevifolia*) and blackbrush (*Coleogyne ramosissima*) communities at elevations >1,500 m above mean sea level (Grinnell 1933, Ingles 1965, Best 1995). Mohave ground squirrel are non-communal and occur at relatively low abundance where present (Leitner and Leitner 2017). Mohave ground squirrel exhibit a seasonal activity pattern (late February to July) followed by an extended period of below ground dormancy annually (Bartholomew and Hudson 1960, Best 1995). During the active period MGS forage heavily to accumulate sufficient fat stores to both reproduce and survival aestivation and hibernation (Best 1995). Despite the need to approximately double their body mass, MGS are a trap shy species with a low detection probability.

Survey Location

MGS Survey Grid: Legal Description

A single of land located in the State of California, County of San Bernardino, and census designated Pinon Hills area with tax assessor number of 3099-08-101-0000. The same properties are more fully described by the Public Land Survey System as having an aggregate area of 10 acres located in the northeast ¼ of the southwest ¼ of the southeast ¼ of Section 30, Township 5 North, and Range 7 West; and entirely within the U.S. Geological Survey (USGS) 7.5-Minute Series Mescal Creek[1] topographic quadrangle (Figure 4). The small project area (<10 acres) prevented the installation of a 10 x 10 or 4 x 25 trapping array, Randel Wildlife Consulting, Inc. installed 36 live traps in a 6 x 6 array with traps spaced 35-m on-center.

MGS Survey Grid: Soil Description

Cajon Sand, 0-2% slopes (Figure 5)

The Cajon series consists of very deep, somewhat excessively drained soils formed in sandy alluvium from dominantly granitic rocks at elevations ranging from 200 to 4,300 feet. Cajon soils are associated with alluvial fans, fan skirts, fan aprons, inset fans, and river terraces with slopes raning form 0 to 15 percent. Vegetation associated with Cajon sand is mostly desert shrubs

1 United States Geological Survey. 2020. 7.5-Minute Mescal Creek Topographic Quadrangle. Reston, VA 22092.

including creosote bush, saltbush, ephedra, Joshua tree, and some perennial and native grasses (NRCS 1986).

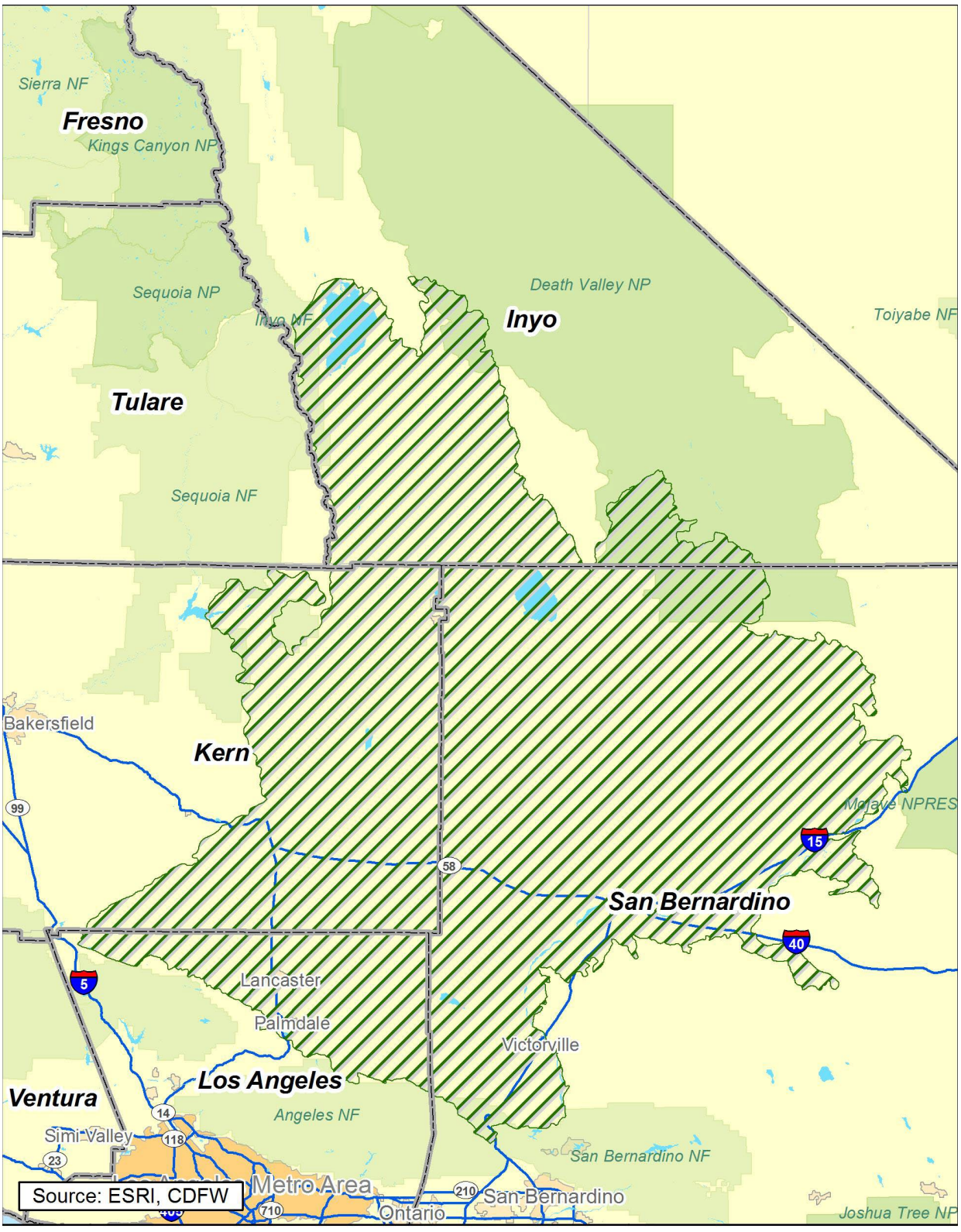
METHODS

Site Reconnaissance / Habitat Assessment

A habitat assessment of the subject property was conducted by Dr. Charles J. Randel in 19 April 2023. Surveys were conducted to allow for 100% visual coverage of the subject site with biological resources and potential constraints to focused surveys identified. As a result of the reconnaissance level surveys, it was determined that suitable habitat for the Mojave ground squirrel was present and focused trapping surveys should be conducted to determine presence/absence of the species within the subject properties.

Focused Surveys: Mohave ground squirrel

Randel Wildlife Consulting, Inc. conducted focused Mohave ground squirrel surveys in accordance with CDFW guidelines (CDFG 2003). Surveys consisted of five consecutive days of live-trapping during three predefined sessions (Session 1: 15 March–30 April; Session 2: 1–31 May; Session 3: 15 June – 15 July). Each survey session consisted of 36 live-traps spaced 35-m on center in a 6 x 6 array, baited with 4-way horse feed, and shaded to prevent heat stress. Traps were checked no less frequently than every four hours, when temperatures were between 40°–90° F.



Mohave Ground Squirrel

Figure 3. Mohave Ground Squirrel Distribution

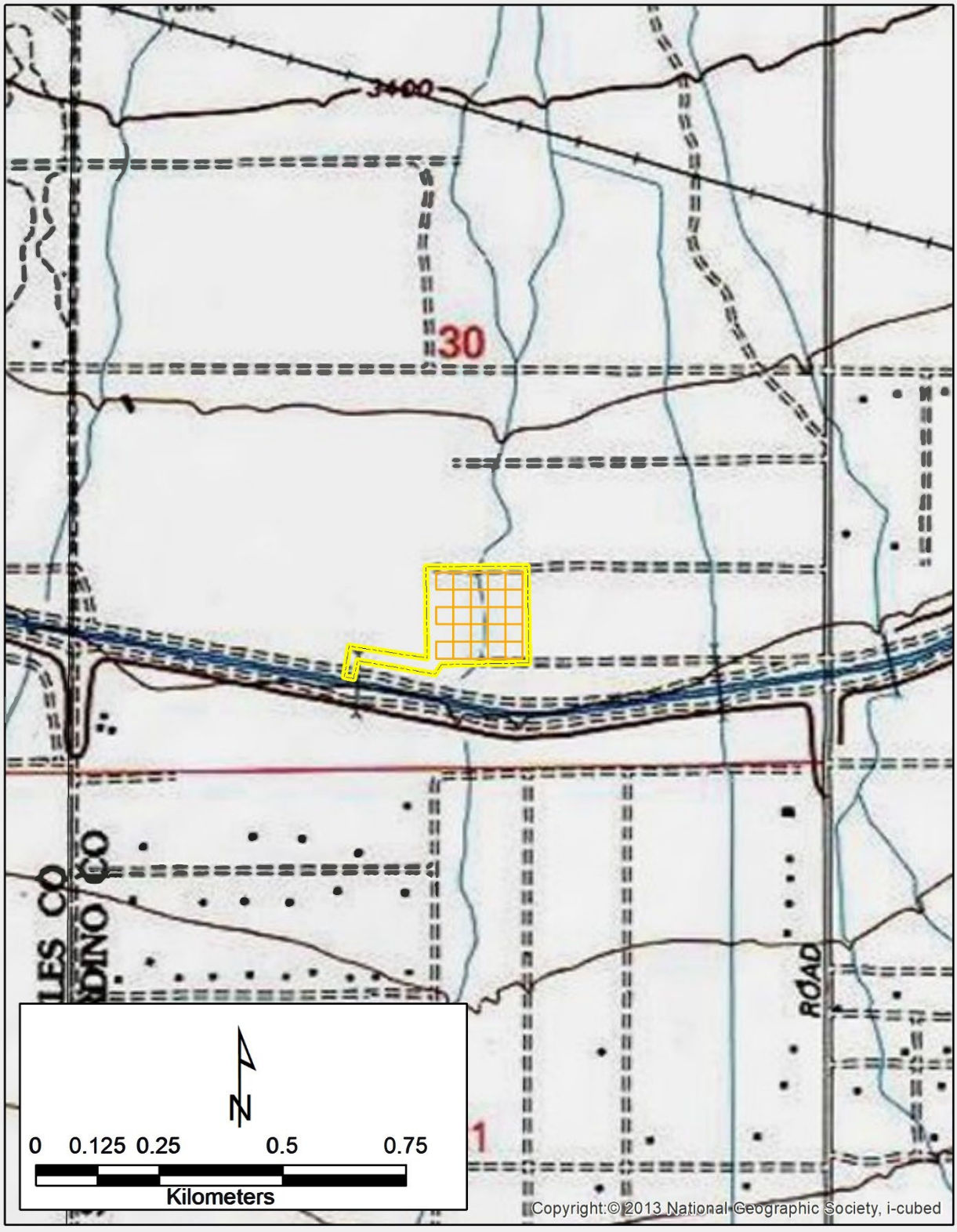


Figure 4
Mohave Ground Squirrel
Survey Location

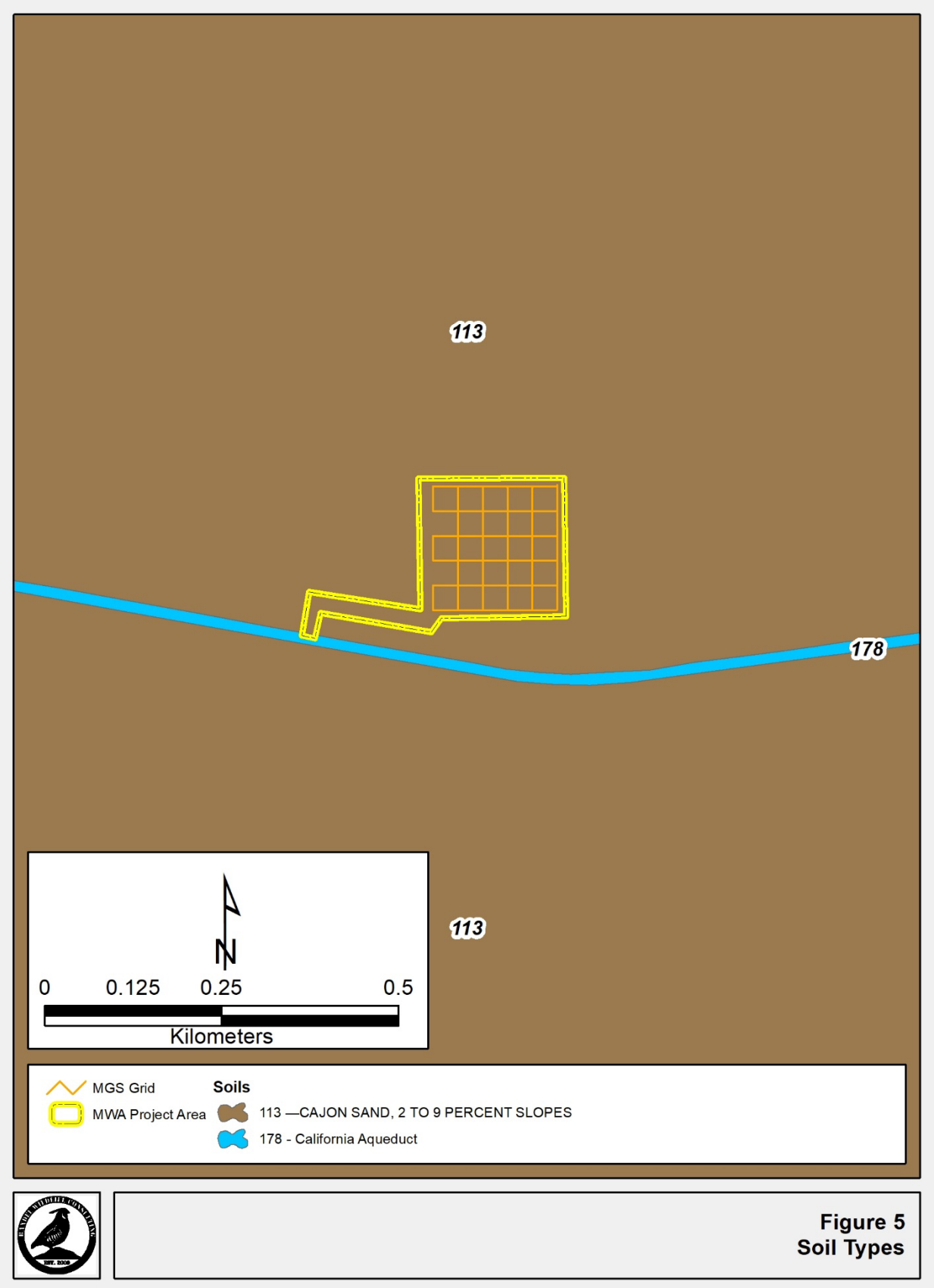


Figure 5
Soil Types

RESULTS

Site Context

Ecoregion

The MGS focused survey site is located in the EPA's Western Mojave Basins Level IV Ecoregion. This ecoregion includes the alluvial plains, fans, and bajadas of major valleys located between the dispersed mountain ranges of the Mojave Basin and Range Level III Ecoregion. North to south climate and vegetation variation is minimal with creosotebush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) dominate on the landscape (Griffith et al. 2016).

Vegetation Alliance

Vegetation was consistent with *Larrea tridentata* Shrubland Alliance (Sawyer et al. 2009). This vegetation alliance is found on minor washed and rills, alluvial fans, bajadas, and upland slopes of well-drained, alluvial, colluvial, and/or sandy soils. *Larrea tridentata* is the dominant species both in terms of relative canopy cover and shrub density, subdominant shrub species included *Atriplex canescens, Lycium cooperii*, *Salazaria mexicana*, *Grayia spinosa*, and *Tetradymia canescens.* Understory was primarily herbaceous with both native and non-native grasses and forbs. Isolated and small stands of *Yucca brevifolia* was present throughout the study area (Appendix A – Site Photographs).

Focused Surveys

CDFW Mohave ground squirrel guideline surveys were conducted by Randel Wildlife Consulting, Inc. on the following dates (Appendix C – Mojave Ground Squirrel Grid Survey Data):

Grid 1

- Session 1: 25–29 April 2023
- Session 2: 26–30 May 2023
- Session 3: 25–29 June 2023

No Mohave ground squirrels were identified as a result of focused surveys of the subject parcels. White-tailed antelope squirrel (*Ammospermophilus leucurus*) were the only mammalian species captured.

Table 1. Summary of diurnal captures by species and trapping session.

Session	Species	New Captures	Recaptures	Total Captures
1	White-tailed Antelope Squirrel	0	0	0
2	White-tailed Antelope Squirrel	3	0	3
3	White-tailed Antelope Squirrel	5	1	11

LITERATURE CITED

Bartholomew, G.A., and J.W. Hudson. 1960. Aestivation in the Mohave ground squirrel *Citellus mohavensis*. Bulletin of the Museum of Comparative Zoology 124:193–208.

Best, T.L. 1995. *Spermophilus mohavensis*. Mammalian Species 509:1–7.

California Department of Fish and Game [CDFG]. 2003. Mohave ground squirrel survey guidelines. California Department of Fish and Game, Sacramento, CA, USA.

Griffith, G.E., J.M. Omernik, D.W. Smith, T.D. Cook, E. Tallyn, K. Moseley, and C.B. Johnson. 2016. Ecoregions of Calfornia (poster): U.S. Geological Survey Open-File Report 2016-1021, with map, scale 1:1,100,000.

Ginnell, J. 1933. Review of recent mammal fauna of California. University of California Publications in Zoology 40:71–234.

Gustafson, J.R. 1993. A status review of the Mohave Ground Squirrel (*Spermophilus mohavensis*). California Department of Fish and Game. Nongame Bird and Mammals Report 93-9.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. California Department of Fish and Game, Sacramento, CA, USA.

Ingles, L.G. 1965. Mammals of the Pacific states: California, Oregon, and Washington. Stanford University Press, Stanford, CA, USA.

Leitner, P. 2008. Current status of the Mohave ground squirrel. Transactions of the Western Section of the Wildlife Society 44:11–29.

Leitner, B.M., and P. Leitner. 2017. Diet of the Mohave ground squirrel (*Xerospermophilus mohavensis*) in relation to season and rainfall. Western North American Naturalist 77:1–13.

Natural Resources Conservation Service [NRCS]. 1986. Soil survey San Bernardino County, California, Mojave River Area. United States Department of Agriculture, Soil Conservation Service, Washington, DC.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens (eds.). 2009. A manual of California vegetation (2nd ed.). California Native Plant Society, Sacramento, CA, USA.

United States Geological Survey. 2023. 7.5-Minute Adelanto Topographic Quadrangle. Reston, VA 22092.

APPENDIX A –REPRESENTATIVE SITE PHOTOGRAPHS

Photos	
Description **MWA MGS Grid** **26 May 2023** Photo from NW to SE Northwest corner of Mohave ground squirrel survey grid. Image is taken toward interior of grid showing Mixed Mojave Woodland habitat.	
Description **MWA MGS Grid** **26 May 2023** Photo from SW to NE Southwest corner of Mohave ground squirrel survey grid. Image is taken toward interior of grid showing Mixed Mojave Woodland habitat and dry wash.	

Photos

Description
MWA MGS Grid
26 May 2023
Photo from SE to NW
Southeast corner of Mohave ground squirrel survey grid. Image is taken toward interior of grid

Description
MWA MGS Grid
26 May 2023
Photo from NE to SW
Northeast corner of Mohave ground squirrel survey grid. Image is taken toward interior of grid

APPENDIX B –WEATHER SUMMARY

Date	Temperature (F)				Cloud Cover (%)				Wind (MPH)			
	Min	Time	Max	Time	Min	Time	Max	Time	Min	Time	Max	Time
4/25/23	57	0615	85	1515	0	0530	0	1730	0	0530	15	1330
4/26/23	48	0600	88	1730	0	0530	0	1800	0	0530	20	1400
4/27/23	54	0600	90	1400	0	0530	0	1400	0	0530	15	1330
4/28/23	56	0600	92	1400	0	0530	0	1300	0	0530	10	1300
4/29/23	56	0600	93	1300	0	0530	0	1300	0	0530	10	1000
5/26/23	50	0645	77	1400	0	1400	15	0645	0-3	0645	5-10	1730
5/27/23	54	0615	91	1600	0	1600	30	0615	0-5	0615	0-5	1600
5/28/23	55	0615	81	1700	0	0615	0	1730	0-5	0615	5-10	1730
5/29/23	51	0630	80	1500	0	0630	0	1500	0-3	0630	0-5	1500
5/30/23	51	0630	76	1500	25	1745	30	0630	0-3	0630	10-15	1630
625/23	50	0600	92	1400	0	0530	0	1400	0-5	0530	5-10	1400
6/26/23	59	0530	93	1245	0	0530	0	1245	0-5	0530	5-10	1245
6/27/23	60	0600	91	1128	0	0530	0	1128	0-5	0930	5-10	1128
6/28/23	57	0530	93	1300	0	0530	0	1330	0-5	0530	5-10	0930
6/29/23	65	0530	91	1000	0	0530	0	1000	0-5	0530	0-5	1000

APPENDIX C – WILDLIFE SPECIES OBSERVED

Common Name	Scientific Name
Cabbage white	*Pieris rapae*
Desert blister beetle	*Lytta magister*
Soft-winged flower beetle	*Collops sp.*
Inflated beetle	*Cysteodermus armatus*
Yellow-backed spiny lizard	*Sceloperus uniformis*
Western side-blotched lizard	*Uta stansburiana elegans*
Great Basin whiptail	*Aspidoscelis tigris tigris*
Common raven	*Corvus corax*
Rock dove	*Columbia livia*
Black phoebe	*Sayornis nigricans*
House finch	*Haemorhous meicanus*
Cactus wren	*Campylorhynchus brunneicapillus*
Northern mockingbird	*Mimus polyglottos*
Mourning dove	*Zenaida macroura*
Black-throated sparrow	*Amphispiza bilineata*
White-crowned sparrow	*Zonotrichia leucophrys*
Loggerhead shrike	*Lanius ludovicianus*
Ash-throated flycatcher	*Myiarchus cinerascens*
California quail	*Callipepla californica*
Common nighthawk	*Chordeiles minor*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Cliff swallow	*Petrohelidon pyrrhonota*
Red-tailed hawk	*Buteo jamaicensis*
Western kingbird	*Tyrannus verticalis*
White-tailed antelope squirrel	*Ammospermophilus leucurus*
California ground squirrel	*Otospermophilus beechyii*
Black-tailed jackrabbit	*Lepus californicus*
Desert cottontail	*Sylvilagus audubonii*
Desert kit fox (tracks)	*Vulpes macrotis*
Coyote	*Canis latrans*
Domestic dog	*Canis familiaris*