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# HYDROSTOR – WILLOW ROCK

## MOHAVE GROUND SQUIRREL PROTOCOL SURVEY REPORT

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## Executive Summary

Permitted biologists Steven Chen, Corey Chan, Dalton Stanfield, and Kyle Tabor completed California Department of Fish and Wildlife (CDFW) protocol live trapping for the Mohave Ground Squirrel (*Xerospermophilus mohavensis*). In addition to protocol surveys, biologists deployed game cameras and bait tubes as an additional method of detection for each grid trapped. Surveys were conducted between March 15<sup>th</sup> and July 15<sup>th</sup>, 2023 in support of Hydrostor's Preferred Project. Two property groupings within the project were trapped: Ansel Properties (6 grids), and Sierra Highway (1 partial grid). No Mohave ground squirrels were detected during protocol surveys or camera trapping efforts. Non-sensitive species captured included white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), western whiptail (*Aspidoscelis tigris*), and spiny lizard (*Sceloporus uniformis*). Based on the results from the survey, the Project site is not currently occupied by Mohave ground squirrel.

## Introduction

At the request of WSP USA Environment and Infrastructure, Inc. (WSP USA), permitted biologist Steven Chen (SC-012551/Memorandum of Understanding) and three independent investigators Corey Chan, Dalton Stanfield (SC-220270002), and Kyle Tabor completed protocol surveys for the California threatened Mohave ground squirrel (*Xerospermophilus mohavensis*; MGS) in support of Hydrostor's Willow Rock Preferred Project. In total, six full grids and one partial grid were trapped. In addition to protocol live trapping, biologists deployed game cameras and bait tubes as an additional method of detection for each grid. All survey areas are located within Kern County, CA and work occurred during a "superbloom" event after ample rainfall incurred during the winter months.

## Project site Description

### Ansel Properties

The Ansel Properties consists of 15 parcels totaling 438.9 acres all located within Kern County, CA. The site is depicted on the U.S. Geological Survey (USGS) *Soledad Mountain* California 7.5-minute topographical quadrangle map. The Ansel Properties was further divided into three different sites based on APN number and location referred to as APN 1, APN 2, and APN 3. Vegetation and land cover within the Ansel Properties consists of *Yucca brevifolia* Woodland Alliance in association with *Larrea tridentata*-*Ambrosia dumosa*-*Eriogonum fasciculatum* Shrubland Alliance, Joshua tree Woodland / Creosote bush- white bursage - California buckwheat Shrubland Alliances.

Joshua trees (*Yucca brevifolia*) dominate the canopy with few California juniper (*Juniperus californica*) present. Species of perennial shrubs encountered listed in descending order of dominance include: creosote bush (*Larrea tridentata*), California/Nevada ephedra (*Ephedra* sp.), California buckwheat (*Eriogonum fasciculatum*), white bursage (*Ambrosia Dumosa*), winterfat (*Krascheninnikovia lanata*), peach thorn (*Lycium cooperi*), spiny hop sage (*Grayia spinosa*), Anderson wolfberry (*Lycium andersonii*), short-spine-horsebrush (*Tetradymia spinosa*), cheesebush (*Ambrosia salsola*), rubber rabbitbrush (*Ericameria nauseosa*), Cooper's goldenbush (*Ericameria cooperi*), wishbone bush (*Mirabilis laevis*), and silver cholla (*Cylindropuntia echinocarpa*). Perennial herbs observed blooming include common fiddleneck (*Amsinckia menziesii*), rusty popcorn flower (*Plagiobothrys nothofulvus*), Mojave Desert parsley (*Lomatium mohavense*), bristly fiddleneck (*Amsinckia tessellate*), western tansymustard (*Descurainia pinnata*), desert dandelion (*Malacothrix glabrata*), lacy phacelia (*Phacelia tanacetifolia*), Fremont's phacelia (*Phacelia fremontii*), California goldfields (*Lasthenia californica*), Wallace's woolly daisy (*Eriophyllum wallacei*), Fremont's pincushion (*Chaenactis fremontii*), desert calico (*Loeseliastrum matthewsii*), scale bud (*Anisocoma acaulis*), tidy tips (*Layia glandulosa*), and, wire lettuce (*Stephanomeria pauciflora*). Other commonly encountered plants include, cheatgrass (*Bromus tectorum*), red brome (*Bromus madritensis*), and Mediterranean grass.

APN 1 (Odel Property) is located on the east side of State Route 14 (SR-14) and is composed of one 160.8 parcel (APN 471-010-01). This project site is within Soledad Mountain California 7.5-minute topographical quadrangle map in Section 3 of Township 9 north and Range 12 west, San Bernardino baseline and meridian. The approximate center of the project site is 34.90466, -118.14397 (WGS84). Grid one's approximate center is 34.90243, -118.14762 (WGS84) and Grid two's approximate center is 34.90720, -118.14184 (WGS84). APN 1 borders department of defense land (Edwards Air Force Base) to the east, BLM land to the north and privately held natural land to the west and south. The western half of the project site is crossed by 10<sup>th</sup> Street West, a rural dirt road, from southwest to northeast. The terrain is relatively flat with a seasonal wash present along the northern section of the project site. Elevation gain is most extreme when measured from the northwest (773m) to southeast (806m). Signs of off-highway vehicle use, and anthropogenic pollution (e.g., illegal dumping) were observed.

APN 2 (Zevsar Property) is located west of SR-14 and northwest of APN 1. This area is comprised of 13 parcels (APN 431-122-03, 431-122-07, 431-122-08, 431-122-14, 431-122-15, 431-122-16, 431-122-17, 431-122-18, 431-122-19, 431-122-20, 431-022-11, 431-022-12, 431-022-13) totaling 198.7 acres. The project site is within *Soledad Mountain* California 7.5-minute topographical quadrangle map, Township 10 north, Range 12 west, San Bernardino baseline and meridian. The approximate center for grid three is 34.91399, -118.15879 (WGS84), grid four is 34.91339, -118.15490 (WGS84) and grid five is 34.91039, -118.15676. APN 2 is bordered by Dawn Road to the south with privately held natural land, Aerospace Highway, CA-14 to the west, Sierra Highway to east and mixed rural residential/natural land to the north. Use of off-highway vehicles, residential vehicles, and pedestrian traffic are evident on site, with dogs (*Canis lupus familiaris*) observed on site. Illegal dumping was observed to be prevalent. The project site is relatively flat with an elevation gain of approximately 33 meters, 739-772m, when measured from northwest to southeast. One section of the project site (APN 431-122-08) is characterized by

more windswept dunes and sandy soil in comparison to the rest of the project site. Additional perennial herbs observed on the sandier soil include, desert sand verbena (*Abronia villosa*), purple mat (*Nama demissa*), sand blossoms (*Linanthus parryae*), desert woollystar (*Eriastrum eremicum*), and freckled milkvetch (*Astragalus lentiginosus*).

APN 3 (Villa Haines Property) is located approximately 600 meters west of SR-14, and on the north side of Dawn Road. APN 3 is comprised of one parcel (APN 431-022-08) totaling 79.4 Acres. The project site is within *Soledad Mountain* California 7.5-minute topographical quadrangle map, Township 20 north, Range 12 west, Section 32, San Bernardino baseline and meridian. The center grid six is 34.91337, -118.17382 (WGS84). The site is bordered by California State land with a water tank to the west and natural land to east. The north border is privately held natural land. Dawn Road marks the southern border with more privately held rural residential land beyond that. Evidence of off-highway vehicle and residential use were present. Illegal dumping and pollution were present, but landscape was left mostly in its natural state. This project site encompassed some hills with elevation gains between 20-40 meters. The lowest elevation recorded was 812 meters above sea level to the highest at 850 meters above sea level. Minor erosion from rainfall was present, but no jurisdictional water features were observed on site.

#### Sierra Highway

Sierra Highway is in Kern County, CA, USGS quadrangle index *Soledad Mountain*, California 7.5-minute topographical quadrangle map Township 10 north Range 12 west, San Bernardino baseline and meridian. It encompasses 2.1 km of the public ROW running along SR-14 from the Zevsar property (APN 431-122-20) to the northern most property (APN 431-021-04). Approximate grid center 34.92934, -118.14990 (WGS84). The Project site borders SR-14 to east, rural residential land to the north, and privately held rural natural land to the west and south. Elevation change is minimal going from 772m to 781m above sea-level. Evidence of vehicle use (e.g., pullouts) and illegal dumping were observed.

Vegetation and land cover within this portion of Sierra Highway consists of *Larrea tridentata*-*Ambrosia dumosa*-*Eriogonum fasciculatum* Shrubland Alliance, Creosote bush- white bursage - California buckwheat Shrubland Alliances. Species of perennial shrubs encountered listed in descending order of dominance include: creosote bush (*Larrea tridentata*), California/Nevada ephedra (*Ephedra sp.*), California buckwheat (*Eriogonum fasciculatum*), white bursage (*Ambrosia Dumosa*), cheesebush (*Ambrosia salsola*), rubber rabbitbrush (*Ericameria nauseosa*), and Cooper's goldenbush (*Ericameria cooperi*). Sections of the ROW were dominated by the invasive species: London rocket (*Sisymbrium irio*), Sahara mustard (*Brassica tournefortii*), cheatgrass (*Bromus tectorum*), red brome (*Bromus madritensis*), Mediterranean grass (*Schismus barbatus.*), and common-storksbill (*Erodium cicutarium*). A small stand of salt cedar (*Tamarisk spp.*) is present and perennial herbs desert dandelion (*Malacothrix glabrata*), lacy phacelia (*Phacelia tanacetifolia*), Fremont's phacelia (*Phacelia fremontii*), California goldfields (*Lasthenia californica*).

#### **Methods**

Protocol surveys for MGS in *Ansel Properties* were conducted using the *Mohave Ground Squirrel Survey Guidelines* (CDFG 2010), 10 X 10 grid design or 4 x 25 grid design, totaling 100 traps per grid. A modified approach for *Sierra Highway*, which included utilizing 60 traps placed sequentially, was reviewed, and approved by CDFW prior to initiating surveys. A buffer of 500 feet was mapped around human settlements, railroad tracks, and paved roads for avoidance in trapping efforts, as the animal has been described as shy and adverse to human settlements. Grids were placed to maximize the potential for detection by selecting areas rich in known food sources for the Mohave Ground Squirrel and still in as natural of a state as possible. Each trap station consisted of a XLK Sherman Trap and a cardboard A-frame trap cover. Traps were baited using a mixture of 4-way horse feed and peanut butter powder made from a combination of peanut butter and oats. Traps were opened within one hour of sunrise and were checked every two to four hours during each trapping event. Traps were checked at shorter increments during inclement weather (i.e., low/high temperatures, low/high wind speed, precipitation). Traps were closed prior to sunset during inclement weather (i.e., wind speeds above 30 miles per hour, temperatures at or near 90 degrees Fahrenheit or below 50 degrees Fahrenheit). Data recorded for each individual captured included species, sex, age, and reproductive condition. All captured animals were released at their capture location.

In addition to live trapping, camera stations were utilized. Each camera station used a Bushnell Trophy Cam (Model 119874) that is secured with zip ties to a 1-meter U-post. The U-post is driven into the ground at a slight angle to focus on the bait tube. All cameras are facing north to help with glare. Stations are placed near shrubs to provide cover for the animal. A hoe and rake are used to clear annual vegetation and debris from area to prevent the camera from being triggered. Bait tubes are made from 2 in diameter PVC pipe that is cut to 18 in long. There are 9, 10 mm-wide slits cut into the tube. Each bait tube is spray-painted to try to prevent ravens from locating them and to prevent theft. Each bait tube is filled with Four-way Livestock Feed (barley, oats, and corn) and secured to the ground with a 12 in steel spike. A small amount (handful) of Four-way is scattered on top and around bait tube. Five camera stations per grid were deployed and placed randomly throughout the grid, as confirmation camera trapping. Additional camera stations were deployed in areas where trapping did not occur due to parcel size and the presence of railroad tracks. These camera stations attempted to capture evidence of any dispersing individuals from natal habitat into the project sites. Dispersal periods are believed to occur early in the 4-to-12-week post-emergence interval observed in this species, late May to early June, (Harris & Leitner 2004).

**Results**

No MGS or other special-status species were detected during live trapping. Non-sensitive species captured during live-trapping efforts included white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), California ground squirrel (*Otospermophilus beecheyi*), Desert spiny lizard (*Sceloporus magister*), desert woodrat (*Neotoma lepida*), and western whiptail (*Aspidoscelis tigris*).

Additionally, no MGS were detected by camera stations. Special-status species observed by camera stations include Loggerhead Shrike (*Lanius ludovicianus*). Other non-sensitive species captured on film include the coyote (*Canis latrans*), desert kit fox (*Vulpes macrotis*), white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), California ground squirrel (*Otospermophilus beecheyi*), a kangaroo rat species (*Dipodomys spp.*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), and desert woodrat (*Neotoma lepida*). Reptiles documented include: desert spiny lizard (*Sceloporus magister*), western whiptail (*Aspidoscelis tigris*), red coachwhip (*Masticophis flagellum piceus*), long-nosed leopard lizard (*Gambelia wislizenii*), common side-blotched (*Uta stansburiana*). Birds observed include: horned lark (*Eremophila alpestris*), common raven (*Corvus corax*), house sparrow (*Passer domesticus*), Bell's sparrow (*Artemisiospiza belli*), California thrasher (*Toxostoma redivivum*), northern mockingbird (*Mimus polyglottos*), and cactus wren (*Campylorhynchus brunneicapillus*).

**Table 1. Survey Results**

	Session 1	Session 2	Session 3
<b>Ansel Properties Project site (Survey Area 1)</b>			
<b>Grid 1: Trapping</b>	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,
<b>Grid 1: Camera</b>	<i>Ammospermophilus leucurus</i> , <i>Dipodomys spp.</i> ,	<i>Ammospermophilus leucurus</i> , <i>Lepus californicus</i> <i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> , <i>Dipodomys spp.</i> , <i>Otospermophilus beecheyi</i> , <i>Corvus corax</i> , <i>Sceloporus magister</i>
<b>Grid 2: Trapping</b>	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,
<b>Grid 2: Camera</b>	<i>Ammospermophilus leucurus</i>	<i>Dipodomys spp.</i> , <i>Lanius ludovicianus</i> <i>Toxostoma redivivum</i>	<i>Ammospermophilus leucurus</i>
<b>Ansel Properties Project site (Survey Area 2)</b>			
<b>Grid 3: Trapping</b>	<i>Ammospermophilus leucurus</i>	<i>Ammospermophilus leucurus</i>	<i>Ammospermophilus leucurus</i> <i>Otospermophilus beecheyi</i> ,
<b>Grid 3: Camera</b>	<i>Ammospermophilus leucurus</i> , <i>Dipodomys spp.</i> , <i>Lepus californicus</i> <i>Vulpes macrotis</i>	<i>Ammospermophilus leucurus</i> , <i>Otospermophilus beecheyi</i> , <i>Aspidoscelis tigris</i> , <i>Gambelia wislizenii</i> ,	<i>Ammospermophilus leucurus</i> , <i>Dipodomys spp.</i> , <i>Otospermophilus beecheyi</i> ,
<b>Grid 4: Trapping</b>	<i>Ammospermophilus leucurus</i>	<i>Ammospermophilus leucurus</i>	<i>Ammospermophilus leucurus</i> <i>Aspidoscelis tigris</i>
<b>Grid 4: Camera</b>	<i>Ammospermophilus leucurus</i> , <i>Dipodomys spp.</i> , <i>Canis latrans</i>	<i>Ammospermophilus leucurus</i> , <i>Aspidoscelis tigris</i> , <i>Sceloporus magister</i> , <i>Gambelia wislizenii</i> ,	<i>Ammospermophilus leucurus</i> , <i>Otospermophilus beecheyi</i> , <i>Dipodomys spp.</i> ,
<b>Grid 5: Trapping</b>	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> , <i>Otospermophilus beecheyi</i> , <i>Aspidoscelis tigris</i>
<b>Grid 5: Camera</b>	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> , <i>Otospermophilus beecheyi</i> , <i>Aspidoscelis tigris</i> , <i>Sceloporus magister</i> , <i>Uta stansburiana</i> , <i>Gambelia wislizenii</i> , <i>Dipodomys spp.</i> ,	<i>Ammospermophilus leucurus</i> , <i>Otospermophilus beecheyi</i> , <i>Aspidoscelis tigris</i> , <i>Uta stansburiana</i> , <i>Campylorhynchus brunneicapillus</i> ,
<b>Supplemental Camera's</b>	-	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,

		<i>Otospermophilus beecheyi</i> , <i>Corvus corax</i>	<i>Corvus corax</i>
<b>Ansel Properties Project site (Survey Area 3)</b>			
<b>Grid 6: Trapping</b>	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,	<i>Ammospermophilus leucurus</i> ,
<b>Grid 6: Camera</b>	<i>Ammospermophilus leucurus</i> <i>Dipodomys spp.</i> , <i>Masticophis flagellum piceus</i> <i>Mimus polyglottos</i>	<i>Masticophis flagellum piceus</i> <i>Sceloporus magister</i>	<i>Ammospermophilus leucurus</i> , <i>Dipodomys spp.</i> , <i>Otospermophilus beecheyi</i> ,
<b>Sierra Highway Project site</b>			
<b>Trapping</b>	<i>Neotoma lepida</i> <i>Aspidoscelis tigris</i> ,	<i>Neotoma lepida</i> , <i>Otospermophilus beecheyi</i> ,	<i>Ammospermophilus leucurus</i> , <i>Aspidoscelis tigris</i> ,
<b>Camera</b>	<i>Ammospermophilus leucurus</i> <i>Dipodomys spp.</i> , <i>Neotoma lepida</i> <i>Aspidoscelis tigris</i> , <i>Corvus corax</i> <i>Uta stansburiana</i> ,	<i>Ammospermophilus leucurus</i> <i>Aspidoscelis tigris</i> , <i>Corvus corax</i> <i>Sceloporus magister</i>	<i>Ammospermophilus leucurus</i> <i>Aspidoscelis tigris</i> , <i>Corvus corax</i> <i>Uta stansburiana</i> ,

**Conclusion**

The Project sites have an ample supply of food plants. Sympatric species were found at all sites, that are typically found alongside *Xerospermophilus mohavensis*. Additionally, the landscape in many of the project sites appeared largely capable of supporting the species. Given this information, trapping on the properties with support of camera stations were warranted to determine the species presence. However, the results from all 7 grids and 40 camera stations gave no indication that the species was present. Likely, reasons for its absence are the lack of recolonization potential from nearby populations as the species continues to see a contraction in range to only those parts of the desert east of California City and north of Mojave (Leitner 2021). The project sites are also not located in any previously identified potential gene flow corridors (Leitner 2008). Combined with the large-scale development observed through the southern and western portions of the species range likely extirpating it from the area. There was also observed large amounts of illegal dumping which further degraded the quality of the habitat. The potential impact from the development of any of the study areas will likely have a negligible effect on the species survival or current population trends. This data is good for one year.

The results from this trapping effort are consistent with results found in all camera and trapping studies conducted from 1998-2020, in this part of the species historic range. The quad indexes north of the project sites have seen at least 183 protocol level surveys in relation to windfarms and other developments since 1998 (Leitner 2008, 2015). While the habitat is considered suitable for the species, no records exist after 1998. (Leitner 2008, 2015, 2021). The Ansel Properties and Sierra Highway are located on the margin of the generally accepted MGS Range, in the *Soledad Mountain* California USGS 7.5-minute quad index. This is an under-sampled region for this species likely due to the large amount of private land. In the nearby habitat east of the Ansel Properties, extensive camera studies and trapping efforts on Edwards Airforce Base and north towards California City and Mojave have failed to capture any evidence of the species west of Rogers Lake or California City since 1998 (Leitner 2021). It seems clear that the western portion of EAFB does not support a Mohave Ground Squirrel population (Leitner 2021). Additional survey efforts since 2013 have failed to document MGS in Los Angeles County except for the far northeast corner of the county near Edwards Airforce Base and supports the conclusion that the species is likely extirpated in Los Angeles County (Leitner 2008, 2015, 2021).

The chance of colonization of the current project sites are thought to be extremely low. This conclusion is drawn from looking at the species current known core population areas, known dispersal methods and distances, the effects of drought on the species population dynamics and land use of the surrounding landscapes. The nearest population core as identified by Leitner (2008) and could serve as a source population for recolonization would be the Edwards Airforce Base Core Area or (EABCA). This unit is located southeast of Rogers Dry Lakebed and has consistently produced positive results for Mohave Ground Squirrel presence with the earliest observations dating to 1973 (Leitner 2008, 2015, 2021). The closest individual from this population was observed in 1994 and is the only record southwest of Rogers Dry Lakebed, (Buescher et al. 1995). The distance from this observation to the current project site is approximately 11.8 miles (19 Kilometers), with more recent observations being approximately 12.4 miles (20 kilometers) from the study site (Leitner 2021). These distances are more than the known dispersal distances for the species from natal area to hibernation site in one year. The mean distance traveled for this species as observed by Harris and Leitner (2004) was 2.920 km for males and 0.753 km for females. Males traveled the farthest with most individuals moving over 0.6 miles (1 km) in comparison to most females only moving on average 0.3 mile (0.5 km) (Harris & Leitner 2004). The largest distance traveled by any one animal was a male who traveled 3.9 miles (6.23 km) (Harris & Leitner 2004). This individual likely represents a 99<sup>th</sup> percentile for distance dispersed from natal site and should not be interpreted as a likely occurrence for each litter. The longest dispersal distance for females was only 2.4 miles (3.862 km) from natal site (Harris & Leitner 2004) and their dispersal distance is likely the largest

bottleneck in recolonization, as their movements appear more incremental in establishing territory away from natal territory. Harris and Leitner found drought related local extirpation at one study site from 1989 to 1992 and it took 2 consecutive years of above average rainfall and reproduction at other sites in the region for recolonization to occur (Harris & Leitner 2004). This means it would likely take multiple good years of population growth and above average rainfall for the species range to extend, something that isn't guaranteed in the unpredictable desert environment. While most dispersal patterns and directions seemed random, Harris (Leitner 2004) noted that the animals do not cross barren playas or areas without adequate shrubbery. This allows for the identification of possible barriers to recolonization. The largest barriers likely preventing the colonization of the Ansel Properties from the EABCA are the Rogers and Rosamond Dry Lakebeds, large multilane highways, and human developments such as Edwards Airforce Base. It is still not understood what the minimum number of shelter-providing shrubs are necessary for the species to traverse a landscape, so smaller two-lane roads should not be interpreted as major barriers to colonization. The Edwards & Sanborn Solar and Energy Storage Facility could act as another potential barrier for colonization from northern or eastern populations as it now represents a large swath of land that has reduced food availability and increased human activity.

With the period from fall 2020 to early spring 2023 representing an extended drought for the desert regions of California, where drought status fluctuated from abnormally dry to severe D4 level drought as described by NOAA. It is highly unlikely that the species was able to expand its currently occupied habitat and instead likely experienced high levels of localized extirpation outside the known core units. Reducing the likelihood that the species expanded its range towards the current study sites. This conclusion is supported by the trapping data at all project sites. The number of species and number of individuals rose from the first trapping session to the second likely in relation to the ample rainfall that was observed in the area from December 2022 to March 2023 breaking the drought and allowing for high levels of reproduction in the local fauna. Additional camera stations were placed on the farthest northwest section of the Ansel Properties during the period from May 24<sup>th</sup> - June 3<sup>rd</sup> and again from July 10<sup>th</sup>-15<sup>th</sup> in hopes of detecting dispersing individuals. No individuals were observed utilizing this method. Grid 3 on the Ansel Properties had a number of disturbances, primarily stemming from increased human activity resulting from a homeless encampment moving onto the grid May 16<sup>th</sup> then Hydrostor Project beginning some geological testing within the grids borders in early June affecting placement of traps for the third session. The Sierra Highway ROW was mowed during the two-week break in early June. The entity responsible is unknown, but the lack of vegetation along the highway may have deterred a potential colonizer as none were found.



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## Pictures



**Picture 1:**

Photo shows the Ansel Properties as observed on the 7<sup>th</sup> of July 2023. Frame is facing north-northwest from the southeastern portion of the property. Joshua Tree (*Yucca brevifolia*), cheesebush (*Ambrosia Salsola*), and creosote bush (*Larrea tridentata*), are shown in the frame. With *Soledad Mountain* visible in the far distance.



**Picture 2:**

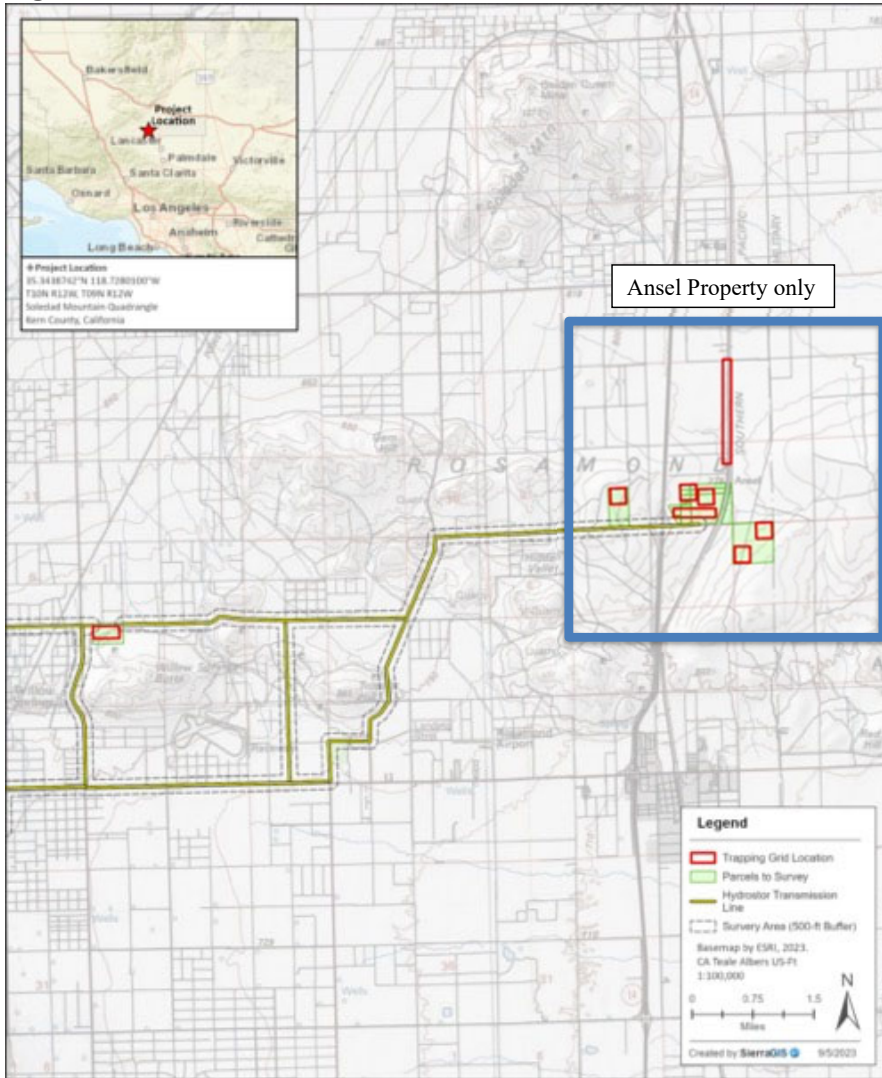
Photo shows Sierra Highway as found on 28<sup>th</sup> of April 2023 facing south. The view includes some of the *Ericameria* species observed. A wide shoulder is present, and several vehicles were observed using it while trapping.



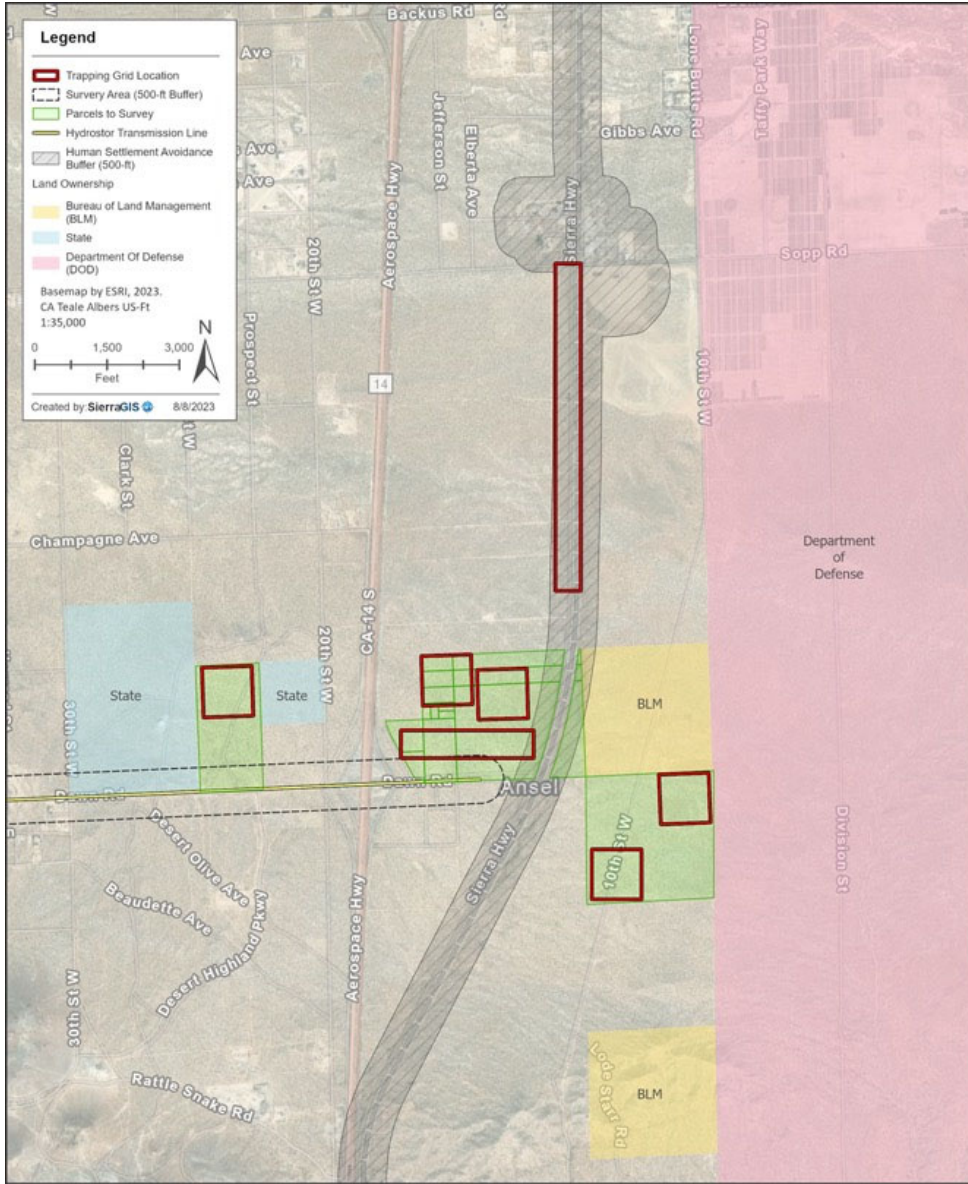
**Picture 3:**

Photo shows Sierra Highway as found on 11<sup>th</sup> of July 2023 facing north. The view shows the mowing that occurred with near total loss of all vegetation along the highway. A trap cover is observed in the bottom lefthand corner.

**Figures:**



**Figure 1.** The Project sites and grid boundaries are represented on this map in relation to the proposed HydrostorProject-Willow Rock Preferred project. The properties highlighted by the blue square represent the Ansel Properties.



**Figure 2.** Ansel Properties Project site with grid and parcel boundaries present. Sierra Highway Project site (long rectangular box) north of Ansel Properties Project site.

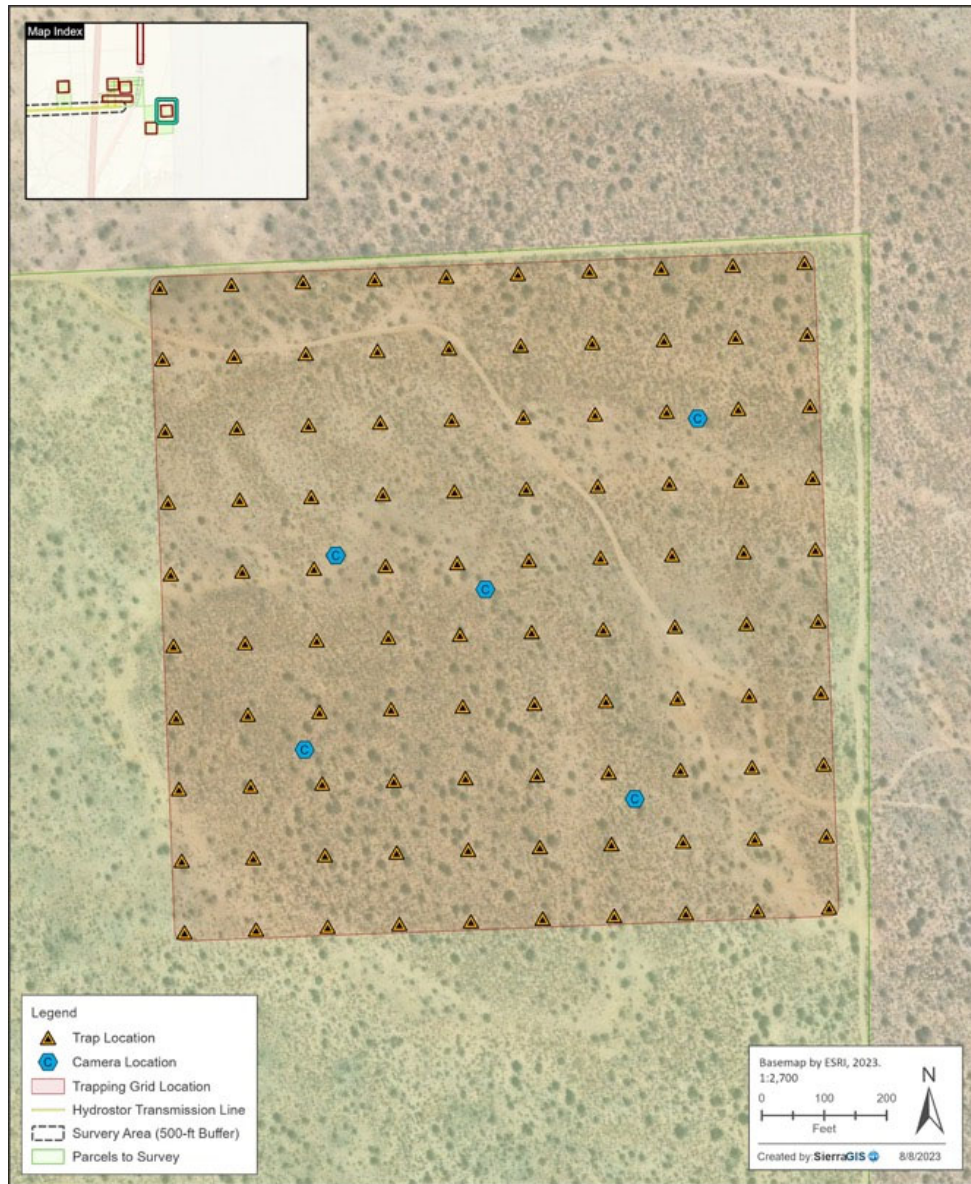


Figure 3. Shows the layout for Grid 1 including cameras for the Ansel Properties APN 1.



Figure 4. Shows the layout for Grid 2 including cameras for the Ansel Properties APN 1.



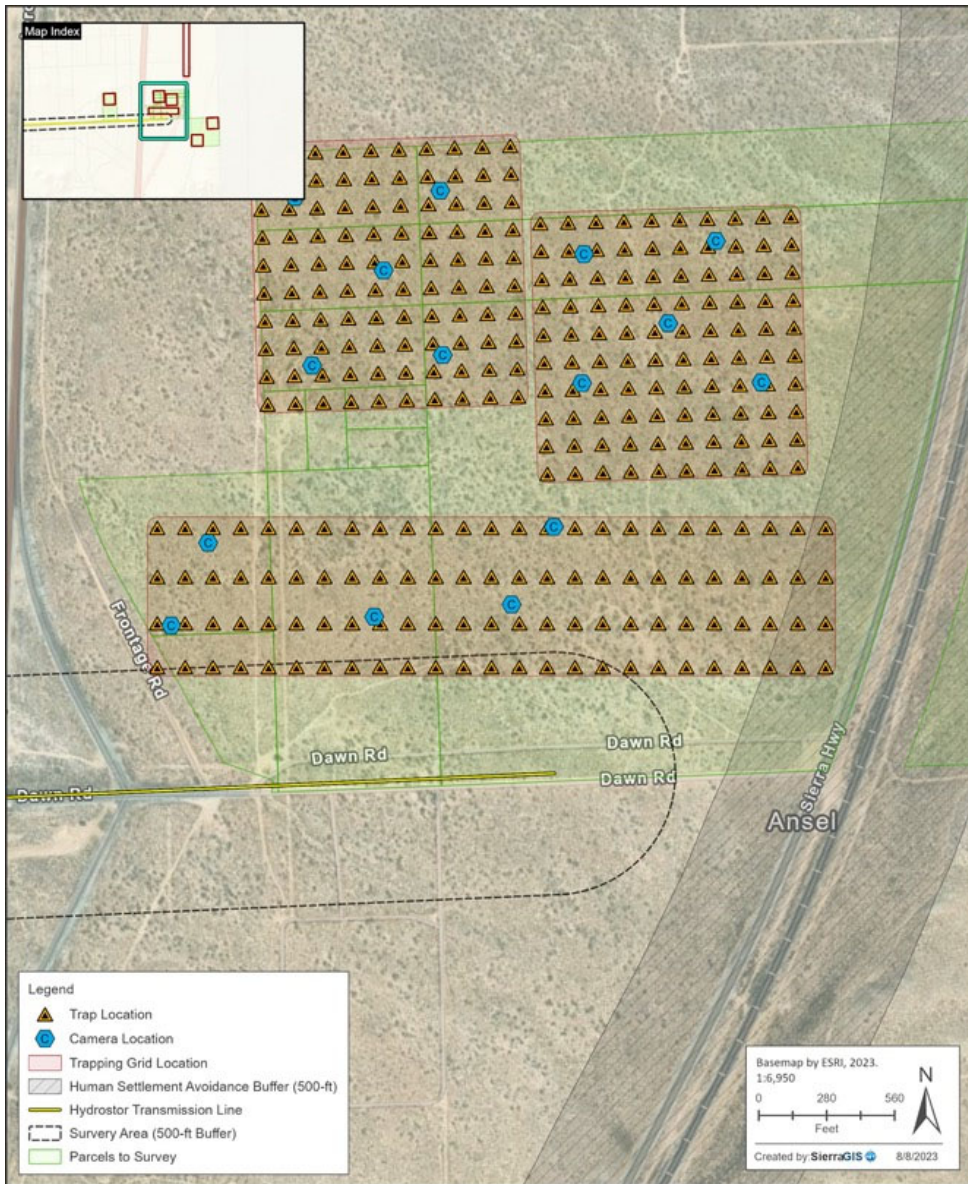


Figure 5. Shows the layout for Grid 3 (east) and Grid 4 (west) (10x10 grids) and Grid 5 (south) (4x25) including cameras for the Ansel Properties APN 2.



Figure 6. Figure shows the additional cameras placed on the Northeastern most portion of the Ansel Properties APN 2.

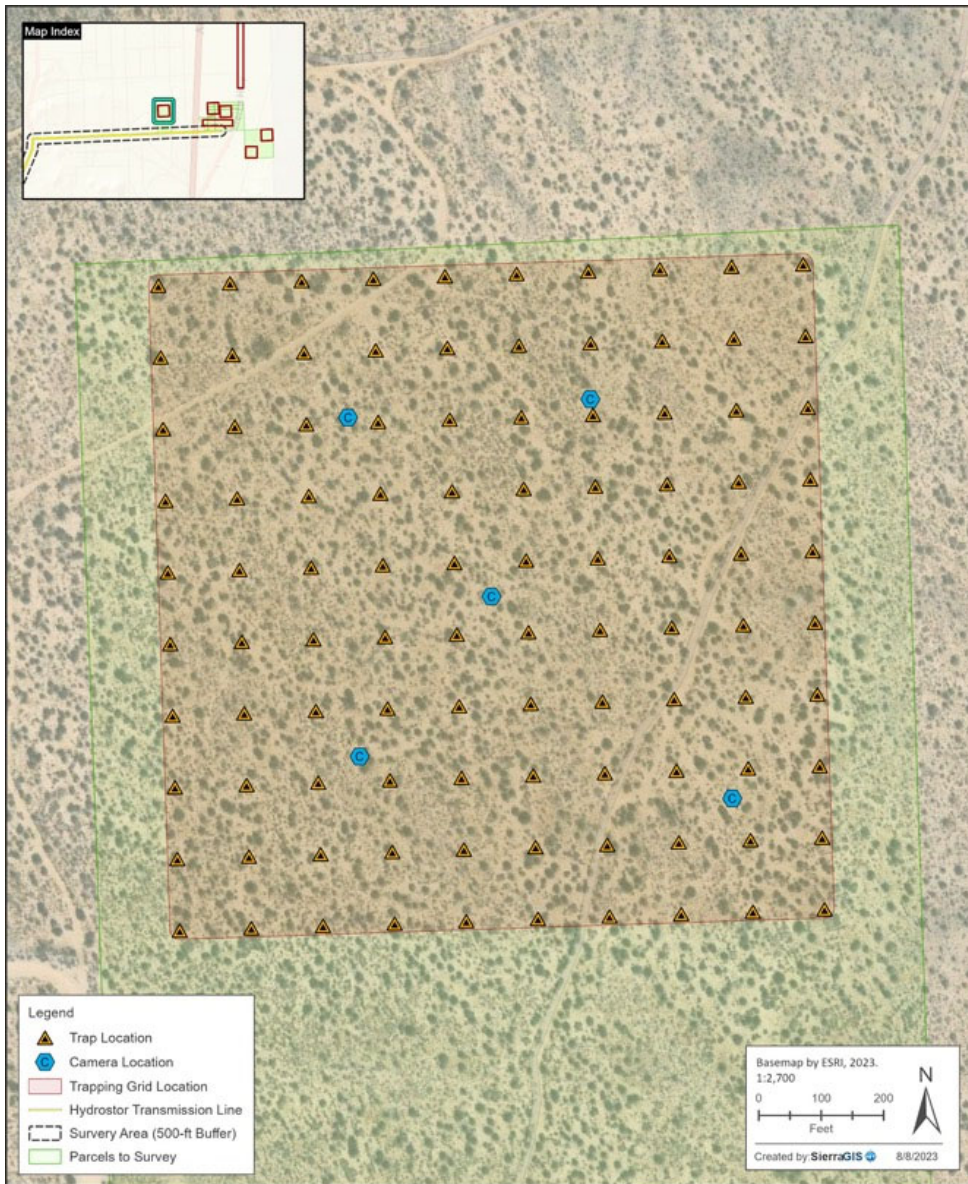


Figure 7. Figure depicts the grid layout and camera positions for Grid 6 of the Ansel Properties APN 3.



Figure 8. Figure depicts the camera stations and trap layout for the Sierra Highway.

## **Appendix I: Data Sheets**

HYDROSTOR WILLOW ROCK PROJECT  
 MOHAVE GROUND SQUIRREL PROTOCOL SURVEY REPORT

Ansel Properties Trapping Data Grid 1:

Date	Biologist	Set Time	Check Time	End Time	Temperature °Fahrenheit	Soil °Fahrenheit	Wind miles per hour	Weather Condition	Individuals Captured	Comments
4/6/23	Tabor	930	1330	1730	50.0	48.0	3	20		
					63.0	68.0	13	20		
					67.0	72.0	7	20	1 Arimosperrnophilus leucurus	
4/7/23	Tabor	830	1230	1630	50.0	48.0	3	20		
					73.0	76.0	15	20		
					64.0	70.0	15	20	1 Arimosperrnophilus leucurus	
4/8/23	Tabor	630	1030	1800	50.0	48.0	11	20		
			1430		68.0	74.0	8	20		
					74.0	78.0	10	20		
					68.0	70.0	9	20	None	
4/9/23	Tabor	800	1200	1800	50.0	48.0	0	0		
			1600		73.0	76.0	0	0		
					82.0	86.0	0	0		
					82.0	86.0	0	10	None	
4/10/23	Tabor	600	1000	1800	50.3	48.0	7	0		
			1400		78.4	76.0	6	0		
					83.8	79.0	9	0		
					87.6	84.0	13	0	None	
5/10/23	Tabor	700	1100	1730	52.3	50.0	12	30		
			1500		67.0	74.0	10	20		
					80.3	83.0	13	<10		
					71.2	78.0	15	<10	1 Arimosperrnophilus leucurus	
5/11/23	Tabor	700	1100	1730	53.2	50.0	4	0		
			1500		71.3	70.0	4	0		
					84.1	84.0	6	0		
					78.2	80.0	8	0	1 Arimosperrnophilus leucurus	
5/12/23	Tabor	630	1030	1430	52.0	52.0	2	0		Closed Due to Temp
					74.0	68.0	4	0		
					88.5	96.0	6	0	1 Arimosperrnophilus leucurus	
5/13/23	Tabor	600	1000	1400	54.0	54.0	3	0		Closed Due to Temp
					83.0	88.0	4	0		
					88.5	98.0	5	10	3 Arimosperrnophilus leucurus	
5/14/23	Tabor	600	1000	1200	58.0	58.0	2	0		Closed Due to Temp
					83.0	88.0	3	<10		
					88.5	92.0	12	20	1 Arimosperrnophilus leucurus	
7/1/23	Tabor	530		830	75.1	76.0	3	0		Closed Due to Temp
				830	88.5	90.0	2	0	2 Arimosperrnophilus leucurus	
7/2/23	Tabor	530		800	75.5	78.0	4	0		Closed Due to Temp
				800	88.0	90.0	3	0	1 Arimosperrnophilus leucurus	
7/3/23	Tabor	530		800	72.8	72.0	4	20		Closed Due to Temp
				800	88.0	86.0	4	10	1 Arimosperrnophilus leucurus	
7/4/23	Tabor	530		910	70.1	68.0	4	0		Closed Due to Temp
				910	88.0	90.0	6	0	6 Arimosperrnophilus leucurus	
7/5/23	Tabor	530		910	68.4	68.0	5	0		Closed Due to Temp
				910	88.0	90.0	7	0	1 Arimosperrnophilus leucurus	

HYDROSTOR WILLOW ROCK PROJECT  
 MOHAVE GROUND SQUIRREL PROTOCOL SURVEY REPORT

Ansel Properties Trapping Data Grid 2:

Date	Biologist	Set Time	Check Time	End Time	Temperature		Soil	Wind	Weather Condition	Individuals Captured	Comments
					*Fahrenheit	*Fahrenheit	moles per hour	miles per hour			
4/12/23	Tabor	0600	1000 1400	1800	50.2	48.0		14	30		
					68.5	72.0		8	40		
					72.2	78.0		18	40		
					61.0	76.0		16	40	1 Arctomyspermophilus leucurus	
4/13/23	Tabor	0830	1230 1600	1800	50.0	50.0		18	20		
					65.0	62.0		23	15		
					69.3	72.0		20	20		
					58.6	60.0		18	20	1 Arctomyspermophilus leucurus	
4/14/23	Tabor	0830	1230 1530	1800	50.0	48.0		8	0		
					69.4	68.0		9	10		
					69.1	76.0		12	<-10		
					67.4	74.0		15	<-10	1 Arctomyspermophilus leucurus	
4/15/23	Tabor	0800	1200 1600	1800	51.3	50.0		5	0		
					76.6	78.0		4	0		
					77.3	86.0		8	0		
					74.0	78.0		12	0	None	
4/16/23	Tabor	0800	1200 1600	1800	50.0	48.0		3	10		
					73.0	67.0		8	20		
					78.8	80.0		16	20		
					74.0	76.0		20	20	2 Arctomyspermophilus leucurus	
5/16/23	Tabor	0600	1000	1200	64.5	60.0		3	30		Closed due to temp
					83.8	92.0		3	30		
					88.5	102.0		5	30	None	
5/17/2023	Tabor	0600	1000	1145	60.5	60.0		4	0		Closed due to temp
					84.8	86.0		3	0		
					88.5	102.0		4	0	None	
5/18/23	Tabor	0600	1000	1000	63.5	64.0		0	0		Closed due to temp
					88.3	98.0		4	0	2 Arctomyspermophilus leucurus	
5/19/23	Tabor	0600	1000	1000	65.1	64.0		4	0		Closed due to temp
					88.5	98.0		4	0	None	
5/20/23	Tabor	0600	1000	1000	68.0	68.0		4	50		Closed due to temp
					88.7	98.0		5	25	None	
7/6/23	Tabor	0600	0920	0920	63.0	62.0		5	0	1 Arctomyspermophilus leucurus	Closed due to temp
					88.0	86.0		6	0		
7/7/23	Tabor	0600	0945	0945	61.6	64.0		4	0	1 Arctomyspermophilus leucurus	Closed due to temp
					86.5	90.0		9	0		
7/8/23	Tabor	0600	0930	0930	69.9	70.0		19	0	1 Arctomyspermophilus leucurus	Closed due to temp
					86.5	90.0		14	0		
7/9/23	Tabor	0600	0940	0940	60.9	62.0		4	0	1 Arctomyspermophilus leucurus	Closed due to temp
					87.0	90.0		2	0		
7/10/23	Tabor	0600	1000	1000	60.8	60.0		4	0	1 Arctomyspermophilus leucurus	Closed due to temp
					86.0	90.0		3	0		

HYDROSTOR WILLOW ROCK PROJECT  
 MOHAVE GROUND SQUIRREL PROTOCOL SURVEY REPORT

Ansel Properties Trapping Data Grid 3:

Date	Biologist	Set Time	Check Time	End Time	Temperature	Soil	Wind	Weather Condition	Individuals Captured	Comments
					° Fahrenheit	° Fahrenheit	mph per hour			
4/11/23	Stanfield	0600	1000 1400	1800	51.0	50.0	0	Clear		
					74.0	74.0	1-3	Clear		
					84.0	81.0	1-3	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					81.4	82.0	3-5	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
4/12/23	Stanfield	0630	1030 1430	1830	50.0	48.0	1-3	Partly Cloudy		
					72.0	68.0	3-5	Partly Cloudy		
					64.4	70.0	5-10	Partly Cloudy	1 <i>Amnosperrnophilus nevadensis</i>	
					56.8	65.0	8-12	Partly Cloudy	1 <i>Amnosperrnophilus nevadensis</i>	
4/13/23	Stanfield	0815	1215 1615	1830	51.0	48.0	8-10	Clear		
					74.2	74.0	10-12	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					64.8	66.0	15-20	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					60.1	60.0	20-22	Clear		
4/14/23	Stanfield	0830	1230 1630	1800	50.2	50.0	3-5	Clear		
					71.8	75.0	8-10	Clear	2 <i>Amnosperrnophilus nevadensis</i>	
					68.3	76.0	8-10	Clear	2 <i>Amnosperrnophilus nevadensis</i>	
					60.4	70.0	12-15	Clear		
4/15/23	Stanfield	0800	1200 1600	1830	52.4	50.0	3-5	Clear		
					75.8	57.0	3-5	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					80.6	77.0	3-5	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					73.1	71.0	5-8	Clear		
5/15/23	Stanfield	0600	1000	1315	54.0	60.0	0-3	Clear		Closed due to temp
					79.6	86.0	0-3	Clear		
					89.0	94.0	0-3	Clear		
5/16/23	Stanfield	0600	1000	1000	60.5	64.0	0-3	Clear		Closed due to temp / Squatters moved onto survey area
					88.5	102.0	3-5	Clear		
5/17/23	Stanfield	0600	1000	1000	63.5	65.0	0-3	Partly Cloudy		Closed due to temp
					88.3	96.0	0-3	Partly Cloudy	2 <i>Amnosperrnophilus nevadensis</i>	
5/18/23	Stanfield	0600	1000	1000	64.0	63.0	0	Clear		Closed due to temp
					88.0	100.0	3-5	Clear		
5/19/23	Stanfield	0600	1000	1000	65.0	60.0	3-5	Clear		Closed due to temp
					89.0	101.0	3-5	Clear		
6/21/23	Stanfield	0600	1000 1400	1800	53.1	60.0	8-12	Clear		
					74.5	81.0	8-12	Clear		
					78.0	94.0	12-18	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					77.5	88.0	18-22	Partly Cloudy	2 <i>Amnosperrnophilus nevadensis</i>	
6/22/23	Stanfield	0600	1000 1400	1800	52.6	58.0	8-12	Partly Cloudy		
					71.8	83.0	8-12	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					75.0	92.0	18-22	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					67.2	80.0	18-22	Clear		
6/23/23	Stanfield	0600	1000 1400	1800	52.1	56.0	8-12	Clear		
					67.8	75.0	8-12	Clear		
					75.4	86.0	8-12	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					78.0	92.0	10-15	Clear	2 <i>Amnosperrnophilus nevadensis</i>	
6/24/23	Stanfield	0600	1000 1400	1800	50.0	50.0	5-8	Clear		
					71.6	74.0	5-8	Partly Cloudy	1 <i>Amnosperrnophilus nevadensis</i> 1 <i>Onychomys leucogaster</i>	
					80.5	85.0	5-8	Partly Cloudy		
					75.3	81.0	18-21	Clear	2 <i>Amnosperrnophilus nevadensis</i>	
6/25/23	Stanfield	0600	1000 1400	1800	55.4	52.0	8-12	Clear		
					76.0	74.0	8-12	Clear	1 <i>Amnosperrnophilus nevadensis</i>	
					81.5	90.0	15-18	Clear	2 <i>Amnosperrnophilus nevadensis</i>	
					80.0	86.0	15-18	Clear	1 <i>Amnosperrnophilus nevadensis</i>	



HYDROSTOR WILLOW ROCK PROJECT  
 MOHAVE GROUND SQUIRREL PROTOCOL SURVEY REPORT

Ansel Properties Trapping Data Grid 4:

Date	Biologist	Set Time	Check Time	End Time	Temperature	Soil	Wind	Weather Condition	Individuals Captured	Comments
					° Fahrenheit	° Fahrenheit	mi/ per hour			
4/16/23	Stanfield	0730	1130	1820	50.3	46.8	0-3	Clear		
					74.6	70.2	2-5	Clear		
			81.0		84.1	8-10	Clear	2 <i>Amnispemophilus</i>		
			74.3		90.1	8-10	Clear			
4/17/23	Stanfield	0730	1130	1830	50.0	44.8	0-3	Clear		
					74.1	68.7	3-5	Clear		
			81.3		77.4	5-8	Partly Cloudy			
			71.6		68.8	10-15	Partly Cloudy			
4/18/23	Stanfield	0830	1230	1800	50.1	46.6	5-8	Clear		
					74.3	80.4	10-12	Partly Cloudy		
			68.4		72.3	10-15	Partly Cloudy			
			70.2		65.7	8-10	Partly Cloudy			
4/19/23	Stanfield	0930	1330	1830	50.1	44.8	15-20	Clear		
					62.4	53.2	20-24	Clear		
			65.8		56.4	15-20	Partly Cloudy			
			61.0		56.0	15-20	Partly Cloudy			
4/20/23	Stanfield	0830	1230	1830	50.0	58.9	0-5	Clear		
					73.0	71.7	0-5	Clear		
			78.8		83.0	0-5	Clear			
			74.0		78.2	0-5	Clear			
5/7/23	Stanfield	0645	1045	1845	50.8	49.5	5-8	Partly Cloudy		
					71.2	68.6	7-12	Clear		
			80.4		82.0	7-12	Clear			
			69.4		74.2	12-15	Clear			
5/8/23	Stanfield	0630	1030	1830	50.8	48.0	3-5	Clear		
					70.1	71.0	8-12	Clear		
			76.2		78.0	12-15	Clear			
			70.8		72.2	8-12	Clear			
5/9/23	Stanfield	0700	1100	1800	51.2	50.0	5-8	Clear		
					71.7	76.0	8-11	Clear	1 <i>Amnispemophilus</i>	
			70.0		73.0	8-11	Clear			
			67.4		70.5	10-13	Mostly Cloudy			
5/10/23	Stanfield	0700	1100	1830	50.5	64.0	8-12	Clear		
					71.0	83.1	15-20	Clear		
			74.6		78.0	15-20	Clear	1 <i>Amnispemophilus</i>		
			65.8		71.0	15-20	Clear			
5/11/23	Stanfield	0700	1100	1830	52.0	50.0	0-3	Clear		
					76.4	80.0	0-3	Clear		
			83.5		87.0	3-5	Clear			
			74.0		78.0	15-18	Clear			
6/26/23	Stanfield	0600	1000	1800	60.0	58.0	8-12	Clear		
					72.4	74.0	8-12	Clear	2 <i>Amnispemophilus</i>	
			75.8		85.0	12-18	Clear			
			79.1		80.0	18-22	Clear			
6/27/23	Stanfield	0600	1000	1800	62.5	54.0	8-12	Clear		
					78.3	82.0	5-8	Clear		
			87.2		95.0	5-8	Clear			
			80.8		96.0	15-20	Clear			
6/28/23	Stanfield	0600	1000	1800	63.6	55.0	8-12	Clear		
					79.8	84.0	7-11	Clear	1 <i>Amnispemophilus</i>	
			85.2		95.0	10-15	Clear			
			80.1		93.0	15-20	Clear	1 <i>Amblyosciurus</i>		
6/29/23	Stanfield	0600	1000	1130	64.0	58.0	3-5	Clear		Closed Due to Temp
					83.5	87.0	3-5	Clear		
					88.0	95.0	3-5	Clear	1 <i>Amnispemophilus</i>	
6/30/23	Stanfield	0600		1000	67.5	65.0	3-5	Clear		Closed Due to Temp
					88.0	94.0	3-5	Clear	1 <i>Amnispemophilus</i>	

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Ansel Properties Trapping Data Grid 5:

Date	Biologist	Set Time	Check Time	End Time	Temperature °Fahrenheit	Soil °Fahrenheit	Wind miles per hour	Weather Condition	Individuals Captured	Comments
4/13/23	Chan	820	1220	1915	66.2	78.8	10 to 14	Clear	2 <i>Ammospermophilus leucurus</i>	
			1615		62.6	68.7	5 to 7	Clear	2 <i>Ammospermophilus leucurus</i>	
			1830		73.7	57.2	15 to 18	Clear	None	
4/14/23	Chan	808	1110	1912	63.7	81.0	1 to 3	Clear	1 <i>Ammospermophilus leucurus</i>	
			1500		78.8	96.4	5 to 7	Clear	1 <i>Ammospermophilus leucurus</i>	
			1830		64.4	63.0	7 to 10	Clear	None	
4/15/23	Chan	811	1200	1902	75.9	88.0	2 to 3	Clear	None	
			1538		78.8	87.8	1 to 2	Clear	1 <i>Ammospermophilus leucurus</i>	
			1805		72.5	75.0	4 to 6	Clear	None	
4/16/23	Chen	730	1120	1745	75.9	63.3	0	15% cloud cover	1 <i>Ammospermophilus leucurus</i>	
			1520		84.0	94.5	7 to 10	15% cloud cover	None	
			1653		75.0	83.7	7 to 10	40% cloud cover	None	
4/17/23	Chan	730	1130	1850	73.0	89.1	0 to 2	clear	1 <i>Apodocoelis tigris</i>	
			1530		73.2	79.2	11 to 15	clear	None	
			1700		69.6	71.2	15 to 19	clear	None	
5/2/23	Chan	917	1315	1825	64.8	81.1	15 to 18	20% cloud cover	None	
			1715		55.2	55.4	10 to 12	17% cloud cover	1 <i>Ammospermophilus leucurus</i>	
5/3/23	Chan	925	1325	1844	64.9	74.1	6 to 8	20% cloud cover	None	
			1725		53.8	59.9	18 to 20	99% cloud cover	None	
5/4/23	Chan	955	1355	1820	65.7	73.6	15 to 18	70% cloud cover	None	
			1716		59.9	63.1	15 to 17	50% cloud cover	None	
5/5/23	Chan	804	1200	1700	64.4	74.8	8 to 12	25% cloud cover	1 <i>Ammospermophilus leucurus</i>	
			1600		62.2	70.9	13 to 17	75% cloud cover	None	
5/6/23	Chan	740	1140	1848	65.1	76.6	12 to 14	12% cloud cover	None	
			1540		69.1	77.9	12 to 15	65% cloud cover	None	
			1710		66.2	72.9	10 to 12	60% cloud cover	None	
6/26/23	Chan	540	940	1945	76.8	98.2	2 to 4	clear	8 <i>Ammospermophilus leucurus</i>	
			1340		86.5	105.1	7 to 9	clear	3 <i>Ammospermophilus leucurus</i> , 1 <i>Apodocoelis tigris</i>	
			1740		81.9	85.1	13 to 16	clear	2 <i>Ammospermophilus leucurus</i>	
			1850		79.2	74.8	5 to 8	clear	None	
6/27/23	Chan	635	1035	1430	82.8	97.3	1 to 2	clear	8 <i>Ammospermophilus leucurus</i>	Closed due to temp
			1310		89.8	122.0	10 to 14	clear	4 <i>Ammospermophilus leucurus</i>	
6/28/23	Chan	605	1000	1345	85.6	91.2	2 to 3	Clear	5 <i>Ammospermophilus leucurus</i> , 2 <i>Onospermophilus beecheyi</i>	Closed due to temp
			1215		89.6	102.7	3 to 5	Clear	3 <i>Ammospermophilus leucurus</i>	
6/29/23	Chan	600	1000	1140	87.6	89.1	1 to 2	clear	3 <i>Ammospermophilus leucurus</i> , 1 <i>Onospermophilus beecheyi</i>	Closed due to temp
6/30/23	Chan	600	914	1030	88.0	95.0	0 to 2	clear	2 <i>Ammospermophilus leucurus</i> , 3 <i>Onospermophilus beecheyi</i> , 1 <i>Sylvilagus auduboni</i>	Closed due to temp

HYDROSTOR WILLOW ROCK PROJECT  
 MOHAVE GROUND SQUIRREL PROTOCOL SURVEY REPORT

Ansel Properties Trapping Data Grid 6:

Date	Biologist	Set Time	Check Time	End Time	Temperature		Soil	Wind	Weather Condition	Individuals Captured	Comments
					°Fahrenheit	°Fahrenheit	°Fahrenheit	miles per hour			
4/18/23	Tabor	0830	1230	1800	50.0	48.0	8	8	<10		
					62.5	72.0	18	18	<10		
			63.3		72.0	20	20				
			58.0		62.0	21	40	4	4 Armmospermophilus leucurus		
4/19/23	Tabor	0930	1330	1730	50.0	48.0	16	16	<10		
					64.3	68.0	17	10			
					60.4	68.0	20	<10	1	1 Armmospermophilus leucurus	
4/20/23	Tabor	0800	1200	1700	50.6	50.0	6	6	0		
					68.6	60.0	6	10			
			1500		75.8	74.0	8	25			
			73.4		82.0	3	30	None			
4/21/23	Tabor	0800	1200	1700	51.3	50.0	5	5	10		
					75.2	82.0	5	0			
			1500		82.2	90.0	8	0			
			79.0		82.0	10	<10	1	1 Armmospermophilus leucurus		
4/22/23	Tabor	0600	1000	1800	51.2	50.0	0	0	10		
					73.2	64.0	8	10			
			1400		82.6	94.0	9	20			
			82.7		94.0	9	20	None			
5/22/23	Tabor	0600		1000	61.8	58.0	3	3	0		Closed due to temp
					88.8	90.0	3	10	None		
5/23/23	Tabor	0600	1000	1130	64.0	64.0	4	4	0		
					86.5	98.0	7	0			
					88.9	102.0	10	10	1	1 Armmospermophilus leucurus	
5/24/23	Tabor	0700	1100	1800	50.0	52.0	5	5	30		
					77.0	84.0	10	20			
			1500		80.6	90.0	13	10			
			75.4		100.0	17	0	None			
5/25/23	Tabor	0700	1100	1800	50.0	52.0	5	5	10		
					73.4	78.0	13	30			
			1500		81.3	100.0	15	10			
			74.3		94.0	21	<10	None			
5/26/23	Tabor	0700	1100	1700	51.0	52.0	6	6	0		
					78.6	80.0	8	0			
			1500		85.6	104.0	12	10			
			77.2		98.0	9	10	None			
7/11/23	Tabor	0600		910	65.5	68.0	3	3	0		Closed due to temp
					86.5	92.0	4	0	0	6 Armmospermophilus leucurus	
7/12/23	Tabor	0600		900	73.2	72.0	3	3	10		
					86.3	90.0	6	0	4	4 Armmospermophilus leucurus	
7/13/23	Tabor	0600		945	71.3	70.0	5	5	20		Closed due to temp
					86.0	88.0	5	20	1	1 Armmospermophilus leucurus	
7/14/23	Tabor	0600		830	75.0	74.0	5	5	0		
					86.5	84.0	4	0	None		
7/15/23	Tabor	0600		800	75.2	74.0	3	3	0		Closed due to temp
					86.0	82.0	2	0	0	None	

HYDROSTOR WILLOW ROCK PROJECT  
 MOHAVE GROUND SQUIRREL PROTOCOL SURVEY REPORT

Sierra Highway Project site Data:

Date	Biologist	Set Time	Check Time	End Time	Temperature	Soil	Wind	Weather Condition	Individuals Captured	Comments
					°Fahrenheit	°Fahrenheit	miles per hour			
4/26/23	Stanfield	0600	1000 1400	1800	52.0	48.0	1-3	Clear		
					71.0	80.0	1-3	Clear		
					87.6	112.0	1-3	Clear		
					89.2	104.0	1-3	Clear	1 <i>Neotoma lepida</i>	
4/27/23	Stanfield	0630	1030	1430	56.4	52.0	1-3	Clear		Closed due to temp
					76.6	88.0	1-3	Clear		
					89.0	118.0	1-3	Clear		
4/28/23	Stanfield	0615	1015	1335	57.2	53.0	1-3	Clear		Closed due to temp
					81.2	86.0	3-5	Clear		
					89.0	113.0	1-3	Clear		
4/29/23	Stanfield	0600	1000	1315	58.3	51.2	1-3	Clear		Closed due to temp
					79.8	82.0	1-3	Clear		
					89.5	110.0	3-5	Clear	1 <i>Apodactylis tigris</i>	
4/30/23	Stanfield	0600	1000	1400	57.0	52.0	1-3	Clear		Closed due to temp
					81.8	88.5	1-3	Clear		
					89.0	109.0	3-5	Clear		
5/23/23	Stanfield	0630	1030	1130	64.5	60.0	1-3	Clear		Closed due to temp
					83.8	91.5	1-3	Clear		
					89.0	104.0	5-8	Clear		
5/24/23	Stanfield	0630	1030 1430	1815	51.0	68.0	3-5	Partly Cloudy		
					70.8	72.0	3-5	Partly Cloudy		
					77.9	82.0	3-5	Partly Cloudy		
					74.4	84.0	3-5	Clear		
5/25/23	Stanfield	0630	1030 1430	1830	51.1	53.0	8-10	Partly Cloudy		
					75.5	82.0	8-10	Partly Cloudy		
					82.1	102.0	15-18	Partly Cloudy	1 <i>Onychomys leucogaster</i>	
					77.2	96.0	15-18	Partly Cloudy		
5/26/23	Stanfield	0630	1030 1430	1830	51.1	64.0	5-8	Clear		
					81.5	88.0	8-12	Clear		
					88.6	95.0	5-8	Clear		
					82.4	102.0	5-8	Clear		
5/27/23	Stanfield	0630	1030 1430	1830	50.8	68.0	1-3	Clear		
					81.0	91.0	3-5	Clear	1 <i>Neotoma lepida</i>	
					89.0	100.0	3-5	Clear		
					84.0	98.0	5-8	Partly Cloudy		
7/11/23	Stanfield	0545		0900	65.2 88.6	71.0 93.0	1-3 3-5	Clear Clear	1 <i>Ammodramus leucurus</i>	Closed due to temp
7/12/23	Stanfield	0530		0900	74.1 88.5	75 100.0	3-5 3-5	Partly cloudy Clear		Closed due to temp
7/13/23	Stanfield	0530		0915	72.4 89.0	71.0 101.0	3-5 3-5	Partly Cloudy Partly Cloudy	1 <i>Apodactylis tigris</i>	Closed due to temp
7/14/23	Stanfield	0530		0800	75.2 88.8	78.0 95.0	3-5 3-5	Clear Clear		Closed due to temp
7/15/23	Stanfield	0530		0745	75.2 88.2	78.0 96.0	1-3 1-3	Clear Clear		Closed due to temp