APPENDIX G

RENU RESOURCES PROPERTY ACQUISITION PROJECT AVIAN STUDY
TRA Environmental Sciences, Inc.

Eastern Kern County Acquisition
Baseline Avian Resources

January 2013

State of California
Department of Parks and Recreation
OHMVR Division

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ReNu Resources Property Acquisition
Avian Study Report

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1.0 INTRODUCTION

1.1 PROJECT OVERVIEW

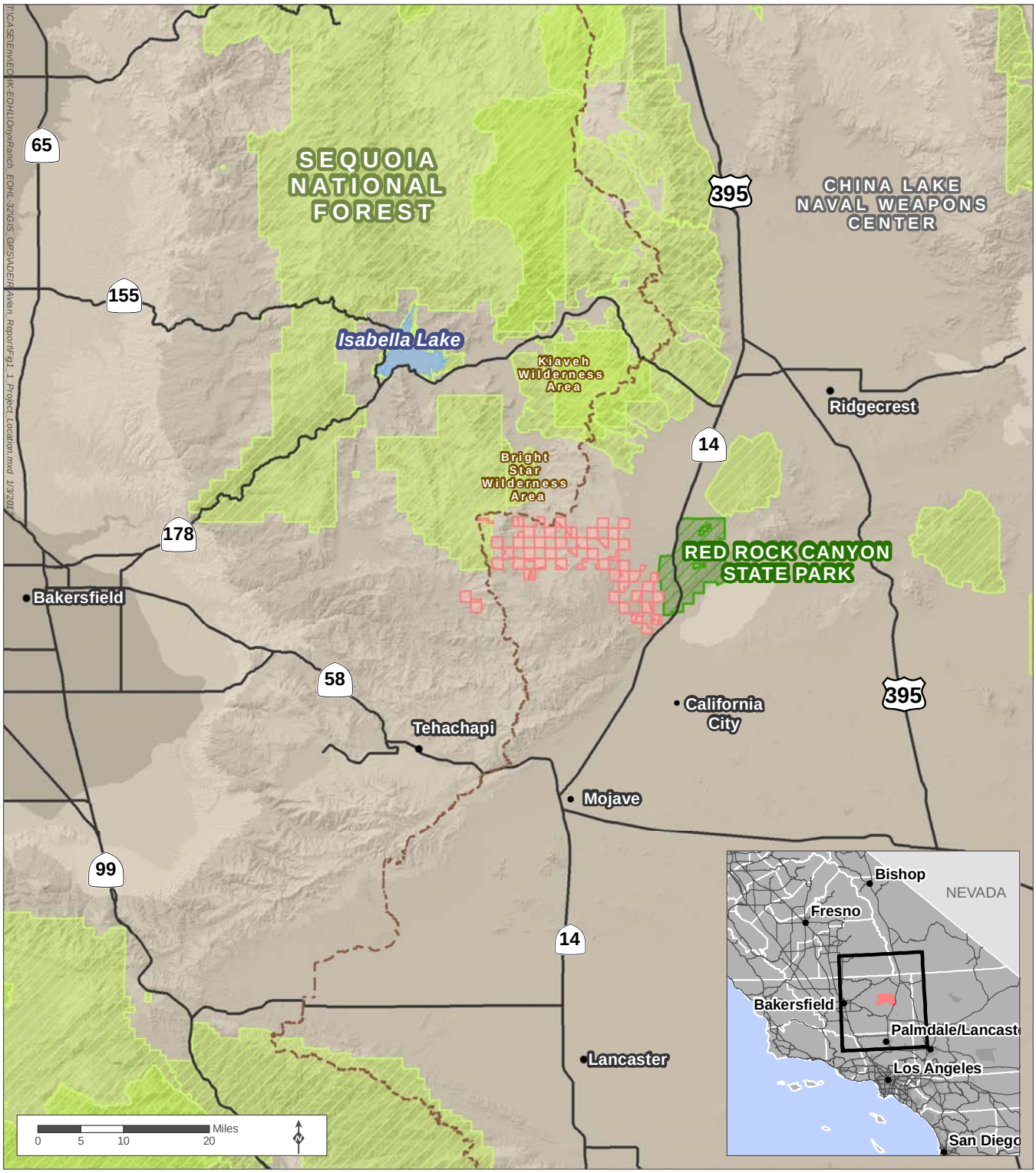
The California Department of Parks and Recreation (CDPR), Off-Highway Motor Vehicle Recreation Division (OHMVR Division) is proposing to acquire 59 privately-owned parcels (approximately 28,300 acres) in Kern County, California, from ReNu Resources, LLC (ReNu); a private company that owns and manages agricultural land in California (Figure 1). The ReNu parcels are largely interspersed with lands owned by the U.S. Bureau of Land Management (BLM), although some parcels are within the Sequoia National Forest or adjacent to private land (Figure 1). Off-highway vehicle (OHV) recreation occurs on many of the ReNu and BLM parcels. From east to west, the lands rise from the high floor of the western Mojave Desert into the southern Sierra Nevada and Piute Mountains. The parcels are within an area frequently referred to as the Onyx or Rudnick Ranch, not to be confused with the areas around the town of Onyx, approximately 20 miles northwest of the project area.

1.2 PROJECT SETTING

Lands designated for acquisition include the following special areas: Butterbredt Springs, an important birding area; lands within the Jawbone Open Area; and lands adjacent to the Dove Springs Open area and Red Rock Canyon State Park (Figure 2). Many parcels support intermittent streams and some are subject to flooding under a 100-year storm event. Nineteen parcels are crossed by existing designated routes for both street legal and non street-legal vehicles.

The majority of these in-holdings are surrounded by BLM lands. Some of these areas are desirable destinations by users of the public lands and have been subject to trespass. Fencing and signage have been installed by the BLM and Friends of Jawbone in these areas to prevent trespass.

The Audubon Society, in cooperation with the private landowner, has established the Butterbredt Springs as a wildlife sanctuary. Acquisition of these parcels would allow public management of Butterbredt Springs for wildlife habitat and compatible uses.



Source: BLM, ESRI, CA State Parks

- Major Roads
- Pacific Crest Trail
- Project Parcels
- US Forest Service
- California State Parks

Figure 1 Project Location

Eastern Kern County Acquisition - Baseline Avian Resources

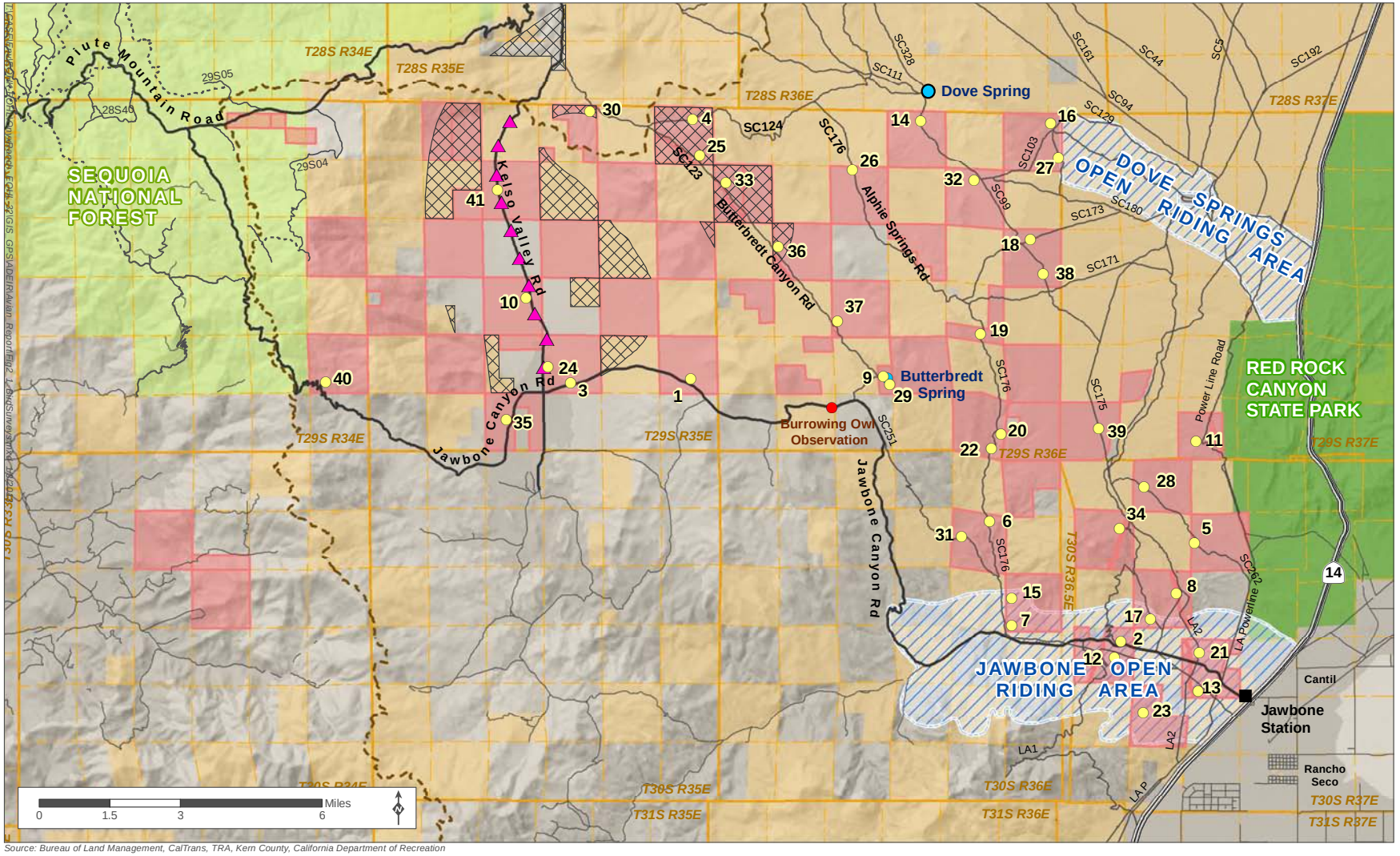


Figure 2 Bird Survey Locations

Eastern Kern County Acquisition - Baseline Avian Resources

1.3 PURPOSE OF THIS REPORT

The purpose of this report is to provide baseline information on the bird species present on the ReNu parcels proposed for acquisition to help inform the biological resources impact analysis that will be prepared as part of the California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) for the proposed project. This report provides a summary of the bird species that occur on the ReNu parcels, including relative abundance and distribution of common year-round, winter, and summer resident bird species, as well as migrant species. This report also identifies special-status bird species and nesting raptors that were observed during surveys and that could potentially occur in the study area. This information will be used to inform the preparation of the EIR and could later be used to guide the development of a bird monitoring program and to inform management decisions if the ReNu parcels are acquired by the OHMVR Division.

For this report, special-status species include the following:

- Species listed as threatened or endangered under the Federal Endangered Species Act or the California Endangered Species Act (California Department of Fish and Game, Biogeographic Data Branch 2011) or proposed for such listing;
- Species listed as candidates under the Federal Endangered Species Act or the California Endangered Species Act (California Department of Fish and Game, Biogeographic Data Branch 2011);
- Species listed as sensitive by the BLM (Bureau of Land Management 2010) or the U.S. Forest Service (United States Forest Service 2005);
- Species listed in the Fish and Game Code as a Fully Protected Species (CDFG 2012) or by the California Department of Fish and Game (CDFG) as a California Species of Special Concern (California Department of Fish and Game, Biogeographic Data Branch 2011).

The purpose of this study is to:

- Characterize the distribution and relative abundance of bird species on the ReNu parcels using point count surveys. This was done to document the baseline avian resources present on the acquisition parcels. The survey data were supplemented by extensive recorded observations by ecologists and amateur bird watchers in the area. These surveys were timed to detect overwintering, migrating, and breeding birds.
- Conduct broadcast surveys for Le Conte's thrasher. Le Conte's thrasher occurs in low densities and can therefore be difficult to detect on point count surveys. To increase the likelihood of detection, we conducted broadcast surveys for Le Conte's thrasher at all the point count locations using a recorded playback of a Le Conte's thrasher song to elicit response from nearby Le Conte's thrashers.
- Conduct broadcast surveys for Bendire's thrasher. A small, isolated population of Bendire's thrasher occurs in Kelso Valley (England and Laudenslayer, Jr. 1989) and individuals have infrequently been observed in this area since England and Laudenslayer's surveys in 1986-1987. Because of the importance of this isolated population, the California Desert Conservation Plan has designated a Bendire's thrasher Conservation area in the western portion of the study area (Figure 2). To increase the likelihood of detection, we conducted broadcast surveys for Bendire's thrasher at all the point count locations and along an additional transect through Kelso Valley.

In addition to the above surveys, we conducted reconnaissance-level surveys to document avian uses of the various habitats in the study area. These included searches of

- Focal habitats: cottonwood-willow riparian stands are important stopover oases for migrants crossing the Mojave Desert and habitat for breeding birds. We conducted thorough searches of cottonwood-willow stands, noting all species detected and searching for raptor nests.
- Raptor nests: special status raptor species (e.g., golden eagle, prairie falcon, burrowing owl) nest in low densities throughout the study area. We scanned suitable habitat throughout the day while walking trails and driving along roads, searching for raptors and their nests.

1.4 STUDY BACKGROUND

Butterbredt Spring is a popular destination for birdwatchers, particularly during spring and fall migration, where it is possibly one of the best places to witness spring migration in California (Heindel 2000). Because of its value as an oasis for migrating birds, Butterbredt Spring has been designated as a "Globally Important Bird Area" by the American Bird Conservancy. Over the years, birdwatchers have documented an extensive number of species occurring in the study area, particularly at Butterbredt Springs, along Jawbone Canyon Road, in Kelso Valley, and along other roads in the study area. These observations have been compiled into a bird list for Butterbredt Springs by (Nature Alley 2012) and is included in Appendix A. BUTTERBREDT SPRINGS BIRD SPECIES CHECKLISTAlso see A for the scientific names of all bird species discussed in this report.

Other avian studies have taken place in the region in support of proposed wind energy farms located adjacent to the study area, including the North Sky River Wind Energy Project to the west, the Jawbone Wind Energy Project to the south and the Padoma Wind Energy Project to the southwest of the study area (Sapphos Environmental, Inc. 2006, 2010, CH2M Hill 2010). These studied are referenced in Chapter 4.0 Discussion.

2.0 METHODS

2.1 POINT COUNT SURVEYS

We used point counts to characterize the avian community in the study parcels, as this method enabled us to maximize the number of parcels and locations within parcels we were able to survey, given the constraints of time and number of survey technicians. We located survey points in each ReNu parcel with at least one road passing through it (Figure 2). One to two points were placed at least 500 m apart, except for points 9 and 29, which were 341 m apart. Points were also placed at least 150 m from a parcel border, except for five points (which were the following distances from a parcel border: pt 5, 133 m; pt 20, 95 m; pt 26, 95 m, pt 27, 90 m, and pt 29, 113 m). Points were randomly placed in the parcels located in the Jawbone Open Riding Area (within 150 m from a parcel border, except for pt 29). Two survey points were placed in each parcel within the open riding area, as the impacts to birds are expected to be greater in the open riding area. Points were far enough apart to ensure that birds weren't counted twice. Surveyors were careful to monitor raptor movements, as they could occasionally be detected from adjacent points. In such instances, raptors were only counted as occurring at the survey point they were first detected. Parcels that weren't accessible by road were not surveyed for logistical reasons and because 1) it is assumed that there will be no project-related impacts to these parcels from OHV use and 2) that these parcels generally supported bird communities similar to parcels with roads. Thirty of the 59 parcels to be acquired are traversed by at least one road and therefore were surveyed; the remaining 29 parcels were not surveyed. Points were located in all major habitat types, including Joshua tree woodland (9 points), desert wash and terrace (8 points), black brush scrub (7 points), creosote and bur sage scrub (6 points), lower Mojave woody scrub (4 points), wetland and riparian vegetation (4 points), annual grassland (2 points) and upper Mojave woody scrub (1 point).

Forty-one points were placed in the 30 parcels that were surveyed. Nine of the points were located within five of the parcels that are in the Jawbone Canyon Open Area (Figure 2). Points were located within 200 m of roads, to make access to points more efficient, except in the open riding area, which is heavily bisected by roads and trails. Vehicle traffic was very low during the early morning hours when point counts were conducted, so proximity to roads did not impact on our ability to detect birds.

We conducted two rounds of point counts; once between March 4-9, 2012 to detect early season breeding birds and over-wintering birds, and once from May 2 – May 5, 2012 to detect spring migrants and breeding birds. Points 1, 3, 10, 20, 23, 24, 35, 40 and 41 were only surveyed in May due to insufficient time in March. In addition, Points 9 and 29 at Butterbredt Springs were only surveyed in March because our point count methods were not sufficient to count the extremely high number of migrant birds passing through Butterbredt Springs during migration in May. Instead, we conducted informal bird surveys at Butterbredt Springs to document the species present, as the species that occur at Butterbredt Springs is well documented (Nature Alley 2012) (see the Butterbredt Spring bird list, Appendix A). As such, 32 points were surveyed in March, and 39 points were surveyed in May; and 30 of the points were surveyed twice (in March and May) while 11 were surveyed only once (either in March or May only).

Strong winds are common in the study area and conditions were windy throughout the April-May survey period, even in the early morning at sunrise. (There are many wind farms in the Mojave-Tehachapi region immediately surrounding the study area, which is just northeast of the proposed Competitive Renewable Energy Zone 52 - Tehachapi (California Energy Commission 2012). Strong winds lower the detectability of singing birds due to the noise of the wind,

particularly in areas of dense vegetation. Because of the open nature of the vegetation, however, we were able to reliably detect singing and calling birds, though likely at a lower rate than in calm conditions. To maximize detection rates, we conducted point counts for 10 minutes (rather than for more commonly used, shorter periods) as more birds tend to be detected during longer surveys (Ralph et al. 1995, Savard and Hooper 1995). In addition, we counted birds that were detected before or after the count (e.g., when walking back to the car) if they were not detected during the count.

We report the number of birds and species based on unlimited distance counts and those detected within 100 m of each point (See Appendix B for point count data sheets). Because the density of birds was low in the study area, the unlimited-distance method allowed us to quantify more species, as a primary goal of this study was to characterize the bird community in the study area. We include birds detected as flying over the point in the unlimited distance counts, but do not include "fly-overs" in the summary statistics for birds detected within 100 m of each point. We also report the number of birds and species within 100 m of each point to provide an estimate of relative abundance. We did not calculate density of birds, as reliably estimating density requires reliable estimates of distance to the bird from the point. The windy conditions throughout the April/May survey period limited our ability to accurately estimate distance to birds and may have introduced unknown bias into estimates of distance.

Though most points were > 150 m from a parcel border (five of the 41 points were < 150 m), a small number of the birds detected may have occurred in an adjacent, non-acquisition parcel. We do not distinguish those birds that may have been detected on non-acquisition parcels from those on ReNu parcels because the habitats and conditions were not visibly different between adjacent parcels. A goal of this study was to characterize the bird community of the study area, and bird species detected on non-acquisition parcels are typical of the study area and are expected to occur on adjacent ReNu parcels.

All bird surveys in this report were conducted by TRA Environmental Sciences Biologists Aaron Gabbe and Megan Kalyankar. Point counts were conducted between sunrise and 11:00 a.m. Name of the observer, date, time and weather (temperature, cloud cover and wind speed) were recorded for each point count. The time and species were recorded for each individual bird observed during the point count; although flocks were recorded as one unit and the number of birds was estimated if they were moving too fast to accurately count. Distance to the bird was estimated to where the bird was first detected and all birds that were detected were recorded regardless of distance from the observer. Birds that were detected as flying over the point, rather than on the ground or in the vegetation, were identified as flying-over.

2.2 BROADCAST SURVEYS

Broadcast surveys were conducted for Le Conte's thrasher at all point count locations in potentially suitable habitat using a protocol modified from Blackman et al. (2011). Broadcast surveys consisted of playing a recorded Le Conte's thrasher song to elicit response from nearby individuals. Songs were played from an mp3 player broadcast through a RadioShack mini amplifier speaker. All the points were in potentially suitable habitat for Le Conte's thrasher except for Point 40, which was in a foothill pine forest. The surveys were conducted from March 4-9, to coincide with their breeding season (Sheppard 1996). Le Conte's thrasher broadcast surveys were conducted immediately after each point count was completed if Le Conte's thrasher was not detected during the point count. All but three of the broadcast surveys were conducted before noon, and most before 11:00 am. Three were conducted in the afternoon, two of which elicited a response from Le Conte's thrashers.

The broadcast survey consisted of 90 seconds broadcast to the north, followed by two minutes of listening and scanning for thrashers, then repeating the same 90 seconds of broadcast to the south followed by two minutes of listening and scanning. If a Le Conte's thrasher was detected at any time during the survey, the broadcasting ceased and distance from observer and number of individuals were recorded.

The same methodology was used for broadcast surveys for Bendire's thrasher, using a Bendire's thrasher song for a playback. Bendire's thrasher surveys were conducted in early May, during their breeding season (England and Laudenslayer, Jr. 1993). In addition to the broadcast surveys conducted at the point count locations, broadcast surveys were conducted for Bendire's thrasher at an additional 10 points, located a half-mile apart along Kelso Valley Road, where it has been found in the past (England and Laudenslayer, Jr. 1989, Sterling 2008) (Figure 2). Six of these points along were located within the ReNu parcels, four on non-acquisition parcels.

2.3 INCIDENTAL SIGHTINGS, SPECIAL-STATUS SPECIES AND NESTING RAPTORS

Each day, after the point counts were completed, the surveyors spent the remainder of the day conducting reconnaissance-level surveys of the study area by slowly driving and walking habitats along the project roads searching for new species, special-status species, and raptor nests. The surveyors scanned for pairs of raptors displaying territorial behavior, nests in trees, cavities and white wash on cliff faces and other signs of raptor nests. The surveyors walked the perimeters of stock ponds and cottonwood-willow riparian areas searching for nests and sensitive species. Any confirmed raptor nests or burrowing owl locations were recorded and GPSed.

Incidental sightings included any new species seen at the points but outside of the point count survey period, new species seen while driving or walking around the study parcels after the morning surveys, and new species by TRA biologists in April while mapping vegetation for this project.

3.0 RESULTS

3.1 POINT COUNT SURVEYS

Forty-one points were surveyed: 32 in March and 39 in May. Seventy-one species were detected during the point count surveys (**Table 1**). Thirty-four species were detected on point count surveys in March (Table 2) and 65 species in May (Table 3). Thirty special-status bird species have the potential to occur in the study area; 15 were detected during the study, either during point counts or incidentally (Table 4).

Based on unlimited-distance point counts, 5.0 species (±2.4 SD) and 8.9 individuals (±6.7 SD) were detected per point in March and 7.6 species (±4.7 SD) and 15.7 individuals (±14.5 SD) were detected per point in May. As an index of relative abundance, within 100 m of each point, 3.9 species (± 2.7 SD) and 6.9 individuals (± 6.8 SD) were detected per point in March and 5.2 species (± 3.9 SD) and 10.0 individuals (± 10 SD) were detected per point in May.

The greatest number of species and birds detected at a point in March occurred at the two points in Butterbredt Springs: 9 species and 27 individual birds detected at point 9 and 9 species and 28 individuals at point 29, based on unlimited-distance counts. In May, the greatest number of species and individuals detected occurred at point 40 in oak-pine woodland (22 species, 52 individuals); at points 24 and 10 in Kelso Valley (18 species, 27 individuals at point 24; 14 species, 21 individuals at point 10); at four points in Butterbredt Canyon northwest of Butterbredt Springs (point 25: 14 species, 16 individuals; point 36: 13 species, 16 individuals; point 37: 12 species, 17 individuals; and point 33, 12 species, 15 individuals) and in a small canyon just north of Butterbredt Canyon (point 4: 16 species, 70 individuals); and at a point in Dove Springs Canyon (point 16; 13 species, 34 individuals), based on unlimited-distance counts.

3.2 BROADCAST SURVEYS

Broadcast surveys were conducted at all point count points for Le Conte's thrasher in March (except for point 20, which was surveyed in May. A Le Conte's thrasher was detected during this survey) and Bendire's thrasher in May to increase the probability of detecting these secretive species. Le Conte's thrasher was detected at 12 out of 40 points (30%) where broadcast surveys were conducted. The broadcast surveys substantially increased detection rates of Le Conte's thrasher above passive surveys (e.g., point count surveys and incidental sighting). Only four Le Conte's thrashers were detected through unsolicited observations (i.e., without playbacks): twice during point count surveys, and twice incidentally at survey points outside of the survey period, whereas Le Conte's thrashers were detected at nine points with the broadcast surveys.

Bendire's thrasher was not detected during point count surveys, broadcast surveys, or incidentally.

3.3 INCIDENTAL SIGHTINGS AND RAPTOR NESTS

During the two survey periods in March and May, two biologists spent a combined total of 210 hrs searching for birds in the study area. All roads that travel through a ReNu parcel were driven slowly numerous times, with extensive sections surveyed on foot. In addition to the species detected on point counts, another 48 species were detected incidentally for a total of 119 bird species detected in the project area (Table 1)**Error! Reference source not found.**. A pair of adult burrowing owls and a juvenile burrowing owl were seen together on three days between May 1 and May 5 together at a burrow in a road-cut along SC251 (Figure 2) on a BLM parcel close to the border of a ReNu acquisition parcel. No other raptor nests were found, though a great-horned owl was regularly seen at Butterbredt Springs and is known to nest there.

Table 1. Species detected in the study area. Species detected on the study area, but not during point counts are identified as being detected incidentally. Point count surveys were conducted in March and May. Species detected in April were detected by project-related biologists conducting botanical surveys. Because their focus was botanical surveys, many species were not detected and/or noted during their time at the study area.

Common name	Latin name	Point count	Incidental only	March	April	May
American White Pelican	*Pelecanus erythrorhynchos*		X		X	
Great Egret	*Ardea alba*		X		X	
Green Heron	*Butorides virescens*		X			X
Cinnamon Teal	*Anas cyanoptera*		X	X		
Northern Harrier	*Circus cyaneus*	X		X		
Cooper's Hawk	*Accipiter cooperii*		X	X		
Swainson's Hawk	*Buteo swainsoni*		X	X		X
Red-tailed Hawk	*Buteo jamaicensis*	X		X		X
Rough-legged Hawk	*Buteo lagopus*		X		X	
Golden Eagle	*Aquila chrysaetos*		X	X	X	
American Kestrel	*Falco sparverius*	X		X		X
Prairie Falcon	*Falco mexicanus*		X		X	
Turkey Vulture	*Cathartes aura*		X		X	X
Osprey	*Pandion haliaetus*		X		X	X
Chukar	*Alectoris chuakar*	X		X	X	X
California Quail	*Callipepla californica*	X		X	X	X
American Coot	*Fulica americana*		X	X		
Killdeer	*Charadrius vociferus*		X	X		X
Spotted Sandpiper	*Actitis macularia*		X			X
Wilson's Snipe	*Gallinago gallinago*		X	X		
Band-tailed Pigeon	*Patagioenas fasciata*		X			X
Mourning Dove	*Zenaida macroura*	X				X
Greater Roadrunner	*Geococcyx californianus*	X		X	X	X
Barn Owl	*Tyto alba*		X	X		
Great-horned Owl	*Bubo virginianus*	X		X		
Burrowing Owl	*Athene cunicularia*		X			X
Vaux's Swift	*Chaetura vauxi*	X				X
White-throated Swift	*Aeronautes saxatalis*	X				X
Anna's Hummingbird	*Calypte anna*	X		X	X	X
Costa's Hummingbird	*Calypte costae*	X				X
Rufous Hummingbird	*Selasphorus rufus*		X	X		
Acorn Woodpecker	*Melanerpes formicivorous*	X				X
Ladder-backed Woodpecker	*Picoides scalaris*	X		X		X
Nuttall's Woodpecker	*Picoides nuttalli*	X				X
Northern Flicker	*Colaptes auratus*	X		X		X

Common name	Latin name	Point count	Incidental only	March	April	May
Olive-sided Flycatcher	*Contopus cooperi*		X			X
Western wood-pewee	*Contopus sordidulus*	X				X
Gray Flycatcher	*Empidonax wrightii*	X				X
Dusky Flycatcher	*Empidonax oberholseri*	X				X
Western Flycatcher	*Empidonax difficilis* or *E. occidentalis*		X		X	X
Black Phoebe	*Sayornis nigricans*		X		X	X
Say's Phoebe	*Sayornis saya*	X		X	X	X
Ash-throated Flycatcher	*Myiarchus cinerascens*	X				X
Cassin's Kingbird	*Tyrannus vociferans*		X			X
Western Kingbird	*Tyrannus verticalis*	X				X
Loggerhead Shrike	*Lanius ludovicianus*	X		X	X	X
Plumbeous Vireo	*Vireo plumbeus*		X			X
Cassin's Vireo	*Vireo cassinnii*	X				X
Warbling vireo	*Vireo gilvus*	X				X
Stellar's Jay	*Cyanocitta stellar*	X				X
Western Scrub Jay	*Aphelocoma californica*	X				X
Common Raven	*Corvus corax*	X		X	X	X
Horned Lark	*Eremophila alpestris*	X		X	X	X
Tree swallow	*Tachycineta bicolor*	X				X
Violet-green Swallow	*Tachycineta thalassina*		X	X		
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*		X			X
Cliff Swallow	*Petrochelidon pyrrhonota*		X	X	X	X
Barn Swallow	*Hirundo rustica*	X				X
Mountain Chickadee	*Poecile gambeli*		X			X
Oak Titmouse	*Baeolophus inornatus*	X				X
Bushtit	*Psaltriparus minmus*		X	X		
Red-breasted Nuthatch	*Sitta canadensis*		X			X
Cactus Wren	*Campylorhynchus brunneicapillus*	X		X	X	X
Rock Wren	*Salpinctes obsoletus*	X		X	X	X
Bewick's wren	*Thryomanes bewickii*	X		X	X	X
House Wren	*Troglodytes aedon*		X			X
Ruby-crowned Kinglet	*Regulus calendula*	X		X		X
Blue-gray gnatcatcher	*Polioptila caerulea*	X				X
Western Bluebird	*Sialia Mexicana*		X	X		
Mountain Bluebird	*Sialia currucoides*	X		X		
Swainson's Thrush	*Catharus ustulatus*		X			X
Hermit Thrush	*Catharus guttatus*	X		X		
American Robin	*Turdus migratorius*		X	X	X	X

Common name	Latin name	Point count	Incidental only	March	April	May
Wrentit	*Chamaea fasciata*	X				X
Northern mockingbird	*Mimus polyglottos*	X				X
Sage Thrasher	*Oreoscoptes montanus*	X		X		
California Thrasher	*Toxostoma redivivum*	X				X
Le Conte's Thrasher	*Toxostoma lecontei*	X		X	X	X
European Starling	*Sturnus vulgaris*		X	X		X
American Pipit	*Anthus rubescens*		X			X
Orange-crowned Warbler	*Oreothlypis celata*	X		X		X
Nashville Warbler	*Oreothlypis ruficapilla*		X			X
Yellow Warbler	*Setophaga petechia*		X			X
Chestnut-sided Warbler	*Setophaga pensylvanica*		X		X	
Yellow-rumped Warbler	*Setophaga coronata*	X		X	X	X
Black-throated Gray Warbler	*Setophaga nigrescens*		X			X
Townsend's Warbler	*Setophaga townsendi*	X				X
Hermit Warbler	*Setophaga occidentalis*	X				X
Hooded Warbler	*Setophaga citrine*		X			X
Common Yellowthroat	*Geothlypis trichas*		X			X
MacGillivray's Warbler	*Geothlypis tolmiei*	X				X
Wilson's Warbler	*Cardellina pusilla*	X				X
Yellow-breasted Chat	*Icteria virens*		X			X
Green-tailed Towhee	*Pipilo chlorurus*		X			X
Spotted Towhee	*Pipilo maculatus*	X		X		X
California Towhee	*Melozone crissalis*	X		X		X
Chipping sparrow	*Spizella passerina*	X				X
Brewer's Sparrow	*Spizella breweri*	X				X
Lark Sparrow	*Chondestes grammacus*	X				X
Black-throated Sparrow	*Amphispiza bilineata*	X				X
Sage Sparrow	*Amphispiza belli*	X		X	X	X
Fox Sparrow	*Passerella iliaca*	X		X		
Song Sparrow	*Melospiza melodia*		X	X		
Lincoln's Sparrow	*Melospiza lincolnii*		X	X		X
White-crowned Sparrow	*Zonothrichia leucophrys*	X		X	X	X
Golden-crowned Sparrow	*Zonotrichia atricapilla*	X				X
Dark-eyed Junco (Oregon)	*Junco hyemalis*	X		X		X
Western Tanager	*Piranga ludoviciana*	X				X
Black-headed Grosbeak	*Pheuticus melanocephalus*	X				X
Lazuli Bunting	*Passerina amoena*	X				X
Red-winged Blackbird	*Agelaius phoeniceus*	X		X		X
Western Meadowlark	*Sturnella neglecta*	X		X	X	X

Common name	Latin name	Point count	Incidental only	March	April	May
Brewer's Blackbird	*Euphagus cyanocephalus*		X	X		
Brown-headed Cowbird	*Molothrus ater*		X	X		X
Bullock's Oriole	*Icterus bullockii*	X				X
Scott's Oriole	*Icterus parisorum*	X				X
Purple Finch	*Carpodacus purpureus*	X				X
House Finch	*Carpodacus mexicanus*	X		X	X	X
Lesser Goldfinch	*Spinus psaltria*	X		X		X

Table 2. Bird species, number of points each species was observed in the March point count surveys and number of individuals detected.

Species	Number of points detected[a]	Number of individuals	Number of points detected (< 100 m)	Number of individuals (< 100 m)
Sage sparrow	23	38	23	38
House finch	15	34	12	29
White-crowned sparrow	14	37	14	36
Le Conte's Thrasher	13[b]	16[b]	1	1
Common raven	13	15	7	8
Cactus wren	12	24	6	8
Bewick's wren	9	12	8	11
Loggerhead shrike	8	10	6	8
Western meadowlark	7	9	5	5
Greater roadrunner	7	7	4	4
Sage thrasher	6	6	5	5
California horned lark	5	5	1	1
California quail	4	8	3	7
Ladder-backed woodpecker	3	4	3	4
Yellow-rumped warbler	3	4	2	3
Rock wren	3	4	1	1
Anna's hummingbird	3	3	3	3
Northern flicker	3	3	2	2
Chukar	2	24	2	24
Oregon junco	2	6	2	6
California towhee	2	4	2	4
Spotted towhee	2	2	2	2
Say's phoebe	2	2	1	1
Red-tailed hawk	1	3	0	0
Orange-crowned warbler	1	2	1	2
Black-throated sparrow	1	1	1	1
American kestrel	1	1	1	1
Ruby-crowned kinglet	1	1	1	1
Fox sparrow	1	1	1	1

Species	Number of points detected[a]	Number of individuals	Number of points detected (< 100 m)	Number of individuals (< 100 m)
Great-horned owl	1	1	1	1
Hermit thrush	1	1	1	1
Mountain bluebird	1	1	1	1
Northern harrier	1	1	0	0
Lesser goldfinch	1	1	0	0
Total		291		220

a Thirty-two points were surveyed in March.
b Includes detection from playback survey.

Table 3. Bird species, number of points each species was observed in the March point count surveys and number of individuals detected.

Species	Number of points detected[a]	Number of individuals	Number of points detected (< 100 m)	Number of individuals (< 100 m)
Sage sparrow	31	69	30	62
House finch	21	48	18	23
Common raven	19	31	8	15
Wilson's warbler	16	26	13	18
Cactus wren	13	15	5	6
California horned lark	10	59	3	48
Ash-throated Flycatcher	10	11	6	7
Western meadowlark	9	20	8	15
MacGillivray's warbler	9	9	8	8
Dusky flycatcher	9	9	7	7
Black-headed grosbeak	8	19	5	16
White-crowned sparrow	7	8	7	8
California quail	7	21	7	20
Western tanager	7	21	3	9
Loggerhead shrike	7	7	5	5
Mourning dove	6	7	4	4
Bewick’s wren	6	6	6	6
Black-throated sparrow	6	6	6	6
Chukar	5	41	5	41
Rock wren	5	7	3	4
Empid sp.	5	5	2	2
Chipping sparrow	3	13	2	11
Yellow-rumped warbler	3	5	2	3
Townsend’s warbler	3	5	1	1
Greater roadrunner	3	3	3	3
Ladder-backed woodpecker	3	3	2	2
Bullock’s oriole	3	3	2	2
Le Conte’s thrasher	3[b]	3[b]	1	1
Northern flicker	3	3	1	1

Species	Number of points detected[a]	Number of individuals	Number of points detected (< 100 m)	Number of individuals (< 100 m)
Orange-crowned warbler	3	3	1	1
American kestrel	3	3	1	1
Scott's oriole	3	3	1	1
Western kingbird	3	3	1	1
Barn swallow	2	5	0	0
Lark sparrow	2	4	2	3
Brewer's sparrow	2	4	1	3
Red-tailed hawk	2	3	1	2
White-throated swift	2	3	0	0
Spotted towhee	2	2	2	2
California thrasher	2	2	2	2
Scrub jay	2	2	2	2
Costa's hummingbird	2	2	1	1
Hermit warbler	2	2	1	1
Lazuli bunting	2	2	0	0
Northern mockingbird	2	2	0	0
Vaux's swift	1	9	0	0
Acorn woodpecker	1	2	1	1
Tree swallow	1	2	0	0
Oregon junco	1	1	1	1
Say's phoebe	1	1	1	1
Ruby-crowned kinglet	1	1	1	1
Blue-gray gnatcatcher	1	1	1	1
Cassin's vireo	1	1	1	1
Golden-crowned sparrow	1	1	1	1
Gray flycatcher	1	1	1	1
Nuttal's woodpecker	1	1	1	1
Oak titmouse	1	1	1	1
Purple finch	1	1	1	1
Stellar's jay	1	1	1	1
Warbling vireo	1	1	1	1
Anna's hummingbird	1	1	0	0
California towhee	1	1	0	0
Lesser goldfinch	1	1	0	0
Red-winged blackbird	1	1	0	0
Western wood-pewee	1	1	0	0
Wrentit	1	1	0	0
Total		560		388

a Thirty-nine points were surveyed in May.
b Includes detection from playback survey.

Table 4. Special-status bird species known to occur or likely to occur in the study area.

Common Name	Latin name	Listing status	Breeding in study area	Detected during this study
American White Pelican	*Pelecanus erythrorhynchos*	CSSC	No	Yes
Northern Harrier	*Circus cyaneus*	CSSC	No	Yes
Cooper's Hawk	*Accipiter cooperii*	WL	Yes	Yes
Swainson's Hawk	*Buteo swainsoni*	ST, USFS S	No	Yes
Ferruginous Hawk	*Buteo regalis*	USFS S, WL	No	No
Golden Eagle	*Aquila chrysaetos*	CFP	Yes	Yes
Bald Eagle	*Haliaeetus leucocephalus*	CFP	No	No
Merlin	*Falco columbarius*	WL	No	No
Prairie Falcon	*Falco mexicanus*	WL	Yes	Yes
Peregrine Falcon	*Falco peregrines*	USFS S, CFP	No	No
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	SE, USFS S	No	No
Long-eared Owl	*Asio otus*	CSSC	Yes	No
Burrowing Owl	*Athene cunicularia*	BLM S, CSSC	Yes	Yes
Vaux's Swift	*Chaetura vauxi*	CSSC	No	Yes
Black Swift	*Cypseloides niger*	CSSC	No	No
Olive-sided Flycatcher	*Contoptus cooperi*	CSSC	No	Yes
Willow Flycatcher	*Empidonax traillii*	USFS S	No	No
Vermilion Flycatcher	*Pyrocephalus rubinus*	CSSC	No	No
Loggerhead Shrike	*Lanius ludovicianus*	CSSC	Yes	Yes
Horned Lark	*Eremophila alpestris actia*	WL	Yes	Yes
Purple Martin	*Progne subis*	CSSC	No	No
Bendire's Thrasher	*Toxostoma bendirei*	BLM S, CSSC	Yes	No
Yellow Warbler	*Dedroica petechia*	CSSC	No	Yes
Yellow-breasted Chat	*Icteria virens*	CSSC	No	Yes
Summer Tanager	*Piranga rubra*	CSSC	No	No
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	CSSC	No	No
Tricolored Blackbird	*Agelaius tricolor*	BLM S, USFS S, CSSC	No	No

BLM S= Listed as Sensitive Species by Bureau of Land Management

USFS S= Listed as Sensitive Species by US Forest Service

SE= Listed as endangered under the California Endangered Species Act.

ST= Listed as threatened under the California Endangered Species Act.

CSSC= Species of Special Concern designated by California Department of Fish and Game

CFP= Fully Protected Species under the Fish and Game Code of California

WL= On the California Department of Fish and Game Watch List.

4.0 DISCUSSION

4.1 POINT COUNT SURVEYS

More species and individual birds were seen per point during surveys in May than in March. Although seven more points were surveyed in May than in March, the variations in number of species, species composition, and relative abundance between the March and May surveys were largely due to the presence of migrants in May, the departure of over-winter residents prior to the May surveys, and the arrival of spring-summer residents.

The number of points surveyed and differences in the locations of those surveyed only in March and May contributed to the variation in the species detected. Seven more points were surveyed in May than in March, though it is unlikely that this difference attributed to the greater number of species and individuals detected per point. The two points at Butterbredt Springs were surveyed in March only and had the highest number of species and individual birds detected of any point in March. It is likely that species were missed from point count surveys by not surveying the two points at Butterbredt Springs in May. We spent an extensive amount of time informally surveying for birds at Butterbredt Springs in May, however, and any observations of species not detected on point counts are denoted as incidental observations in Table 1. Alternatively, points in Kelso Valley (3, 10, 24, 35, 41) and in the adjacent mountains (point 40) were only surveyed in May. A different suite of habitats occur within Kelso Valley than at the points to the east in the study area (and generally at lower elevations), including montane meadow, a stock pond, juniper woodland, and stands of cottonwood and willow. This diversity of habitats attributed to the relatively high diversity of species found in Kelso Valley. Point 40 was located in oak-pine woodland. The species detected at this point were typical of oak-pine woodland, many of which were only detected at this location in the study area, including purple finch, Stellar's jay, wrentit, and acorn woodpecker.

The study area appears to be an important migratory corridor for songbirds, as hundreds to thousands of birds were seen passing though Butterbredt Spring during the spring migration in early May, passing west-northwestward up through the canyons such as Dove Spring Canyon and Jawbone Canyon, and throughout the desert away from the typical migratory hotspots and corridors such as the cottonwood-willow riparian habitats and canyons, respectively. Notable observations of migration include a large flock of approximately 500 horned lark seen in the montane meadows of Kelso Valley near point 35 on May 5; hundreds of tree swallows flying northwestward up Dove Springs Canyon near point 16 (and throughout the study area) on March 6; and thousands (estimate of 1000-2000+) of migrant passerines passing through Butterbredt Springs on the morning of May 1.

The number of bird species detected during point counts and during informal surveys conducted after the point counts is just a fraction of the bird species known to occur in the study area (Heindel 2000, Nature Alley 2012), as the surveys were conducted during a small period of time in the spring buy two people. The Butterbredt Springs – Jawbone Canyon area is a popular destination for birdwatchers and an extensive list of species detected in the area has been compiled based on the observations of ornithologists and birdwatchers (Appendix B) (Nature Alley 2012).

4.2 BROADCAST SURVEYS

Le Conte's thrasher is widespread at low density throughout the study area (except in Kelso Valley and the oak-pine woodland in the western portion of the study area) including in the Jawbone Canyon Open Area (detected at 4 of 8 of the points in the open riding area). This

indicates that it is somewhat tolerant to OHV-related disturbance, perhaps because it breeds in late winter-early spring (Sheppard 1996), before the peak OHV season at the study area.

Although Bendire's thrasher was not detected during the point count or broadcast surveys, it has been observed periodically in small numbers at Butterbredt Springs and in the Kelso Valley. In 1986 and 1987, England and Laudenslayer extensively surveyed for Bendire's thrasher throughout California's Mojave and Colorado Deserts (England and Laudenslayer, Jr. 1989). England and Laudenslayer also conducted a literature review that revealed three records of Bendire's thrasher in the western Mojave Desert – two individuals seen in early April that were likely migrants, and one singing male in mid-June in the Kelso Valley. During their surveys, they detected one individual in the upper Butterbredt Canyon, one ridge east of Kelso Valley. Rick Saval independently located a Bendire's thrasher nest in the Kelso Valley in 1987 (England and Laudenslayer, Jr. 1989). Since the 1986-1987 study, follow-up surveys and incidental observations have periodically detected Bendire's thrasher in the Kelso Valley and Butterbredt Springs.

4.3 SPECIAL-STATUS SPECIES AND NESTING RAPTORS

Of the special-species with the potential to occur in the study area (Table 4), 15 were detected, either during point counts or incidentally during our time at the study area. Of these the special-status species, Cooper's hawk, golden eagle, prairie falcon, long-eared owl, Costa's hummingbird, loggerhead shrike, horned lark, Bendire's thrasher, and Le Conte's thrasher are known to breed in the study area (Nature Alley 2012). A pair of burrowing owls and at least one juvenile burrowing owl was observed near Jawbone Canyon Road between Butterbredt Springs and the Jawbone Canyon Open Area, indicating that burrowing owl also breeds in the study area. Other raptors (not special-status) known to breed in the study area that were observed during this study include red-tailed hawk, American kestrel, and great-horned owl. A pair of red-tailed hawks was observed at point 20 behaving territorially and was likely nesting in the study area. Avian studies conducted for nearby wind energy projects found Cooper's hawk, red-tailed hawk, golden eagle, American kestrel, and prairie falcon nests on or near the ReNu parcels (Sapphos Environmental, Inc. 2006, 2010, CH2M Hill 2010). Many of the special-status bird species detected at the study area were passing through the area on migration, including American white pelican, Vaux's swift, olive-sided flycatcher, yellow warbler, and yellow-breasted chat.

4.4 PROJECT IMPACTS

Direct Mortality

The most direct impact of OHV use to birds is death or injury from vehicle collisions. OHV use may also cause direct mortality by impacting shrubs supporting nests or crushing burrows (e.g, those used by burrowing owls) (Ouren et al. 2007). These impacts are likely greater in the spring and early summer during the nesting season and when OHV use is the highest and the spring migration is occurring. Impacts to burrowing owls through the crushing of burrows can happen year-round, however, as use of burrows by burrowing owls in not limited to the nesting season.

Another possible cause of direct mortality is birds getting trapped in open top vertical pipes on restrooms or other facilities. Any open top vertical pipe can be a death trap to birds and other wildlife, and the remains of birds and other wildlife have been found in open top pipes in other areas. As an example, in 2009 a fallen irrigation sand pipe 6 inches in diameter and 10 feet tall located adjacent to the Kern River Preserve on California Department of Fish and Game Land contained the remains of over 200 birds. In all, forty-five species of birds (and several species of lizards and small mammals) have been found trapped in open-topped pipes in California (Audubon California and Southern Sierra Research Station 2012).

Noise and other Disturbances

OHV traffic is a source of noise and other stimuli that creates disturbance for birds. Traffic noise can lead to significant reductions in breeding bird densities (Reijnen et al. 1995, 1997) and nesting in close proximity to OHV trails can cause an increase in nest abandonment and desertion rates in songbirds and lower abundance of some species adjacent to trails used by OHV (Barton and Holmes 2007). Traffic noise may play a role in altering bird communities by interfering with bird communication during the incubation and fledgling phases (Forman and Deblinger 2000).

Shooting fire arms or discharging fireworks is another source of noise and disturbance for birds. According to Ouren et al. (2007), studies have shown that birds and other wildlife experience accelerated heart rates and metabolic function during disturbance events, which may include OHV use, gunshots and fireworks. During the avian surveys, numerous shells from fire arms were observed and two campers was observed discharging fireworks.

Use of the ReNu parcels by recreationists could provide a food source (e.g., trash) to opportunistic predators such as ravens and coyotes, potentially increasing populations of these species, which could in-turn increase predation rates of the contents of nests (i.e., eggs, nestlings, incubating/brooding adults) and predation of birds off the nest. For example, ravens increased in the Mojave Desert by 1,500 percent between 1968 and 1988 as a result of human activities (Boarman and Berry 1995). Ravens proliferate near garbage dumps, sewage ponds, agricultural areas, and along roads, all of which provide unnaturally abundant food, water, perches, and nest sites (UC Davis Wildlife Health Center 2007).

Habitat Damage

An important characteristic of habitat for birds is the composition and physical structure of vegetation (e.g., height and density of vegetative cover). OHV and other visitor-uses that are restricted to roads and existing trails have limited direct impacts to vegetation; however, OHV in open riding area impacts vegetation cover and illegal use of closed trails and going off designated routes also impacts vegetation. For example, several studies found that OHV use resulted in reduced vegetative cover, that non-native annual grasses were more common in areas with OHV use, and that native annual plants were less common or absent from OHV use areas (Adams et al. 1982, Prose et al. 1987, Bolling and Walker 2000). Also, use of the trail/road system provides access to otherwise remote sensitive habitats such as cottonwood-willow riparian areas, which may see increased use by recreationists. Some of these sensitive areas are fenced off, which prevents access by OHV, but not necessarily foot-traffic, while others are not.

Fragmentation can isolate habitat patches from each other and create edge effects. Negative effects of fragmentation and edge effects include the creation of barriers to dispersal, increases in native and non-native predators, and potential increases in nest parasitism by brown-headed cowbird (CalPIF (California Partners in Flight) 2009). At the study area, existing roads fragment habitat, though birds are unlikely to be isolated in the fragments as they are separated by relatively narrow roads (e.g., rather than extensive tracts of urbanization) and birds regularly fly across roads. However, bird species may still be subject to increased predation or nest parasitism, and may be vulnerable to collisions with vehicles, as discussed previously. Edge effects on bird communities are generally most intense at the interface between development and agriculture and natural habitat. Because the project does not alter (or convert) a substantial amount of habitat to human uses, new edge effects caused by the project are expected to be minimal.

The spread of many exotic plant species is facilitated by access provided by roads (Brooks and Lair 2005) and through provision of livestock feed (Esque and Schwalbe 2002). OHV use can

disturb desert soils, damaging their microbiotic crusts, making them more susceptible to invasion by exotic species (Wilson et al. 2002). Invasive plant species can increase wildfire frequency and intensity in desert habitats (Esque and Schwalbe 2002). Wildfire destroys nesting habitat for birds and rare habitats such as cottonwood-willow riparian can be destroyed by wildfire, thereby substantially impacting important habitat for birds and other wildlife.

Livestock grazing has been documented to degrade other shrubland habitat (i.e. coastal scrub) by preventing the growth of young shrubs, opening up the shrub canopy to invasion by exotic annuals, and reducing the ability of native forbs and grasses to compete with exotics (CalPIF (California Partners in Flight) 2009). Such effects can alter vegetation structure and composition, which may impact bird populations.

In addition, OHV users and other recreationists may increase the risk of wildfire through campfires, fireworks or engine idling over dry vegetation. Non-native annual grasses may also build up fuel loads and increase the risk of wildfire (CalPIF (California Partners in Flight) 2009). Wildfire alters habitat for birds. For example, one study showed that most native desert shrubs are poorly adapted to wildfire and failed to regenerate after fire; creosote bush (*Larrea tridentata*), burro-bush (*Ambrosia dumosa*) and pricklypear (*Opuntia* spp.) shrubs were replaced by open stands of brittle bush (*Encelia farinosa*), native ephemerals and non-native annual grasses (Brown and Minnich 1986).

Nesting Special-status Birds. Burrowing owls are particularly vulnerable to off-highway vehicle use as burrows may be crushed by vehicles. Other ground nesting birds in the area, such as California horned lark, are also more vulnerable as nests could be run over.

Species that nest in shrubs, such as loggerhead shrike, Bendire's thrasher and Le Conte's thrasher, may be more vulnerable to the direct impacts of OHV use (e.g., collisions of OHV into nests) than species that nest at greater heights in trees (i.e., Cooper's hawk, Nuttall's woodpecker). Individuals of these species could potentially be impacted by noise and other disturbance created by OHV-use should any of these species nest close roads.

Migrating and Over-wintering Special-status Birds. Migrating and over-wintering special-status birds are less impacted by OHV use and other impacts because they are in the area for a short time (migratory species), do not nest in the area and/or are in the area during the time of year when there is less OHV use and other recreational activity (wintering species). While these species may still be subjected to some of the impacts of OHV use, such as vehicle collision or habitat damage, such impacts are generally considered less than significant for the reasons discussed above.

4.5 RECOMMENDATIONS

Although acquisition of the ReNu parcels by OHMVR Division is unlikely to result in any new impacts to bird species on the parcels, the following recommendations will help to protect the resident bird community, special-status bird species, and nesting raptors:

1. To prevent habitat damage and avian mortality from illegal OHV trail use:
    - Work with Friends of Jawbone to identify illegal trails that should be closed;
    - Close illegal trails with fencing;
    - Post signs to keep OHV users off of illegal trails; and

- Educate OHV users and other recreationists about the presence of special-status and nesting birds via interpretive signs and/or brochures, particularly burrowing owls and other ground nesting species.

2. To prevent damage to sensitive habitats that support nesting and migrating birds from recreational users and grazing livestock:
    - Fence off sensitive habitat areas such as cottonwood riparian or springs;
    - Place signs to indicate environmentally sensitive areas.
3. To minimize avian mortality from collisions with vehicles:
    - Post speed limits on roads open to street legal vehicles only.
4. To prevent attracting opportunistic predators such as ravens and coyotes:
    - Provide lidded trash bins in camping areas;
    - Post signs reminding recreationists throw trash in the bins or pack it out with them.
5. To prevent avian mortality from open top vertical pipes:
    - Remove any pipes that can be removed;
    - Cap pipes with a concrete plug or fill them with sand, gravel or concrete if they can't be removed; and
    - Cover rooftop plumbing and heating vents with ½" galvanized hardware cloth held in place by stainless steel pipe clamps or commercially available vented caps.
6. To prevent habitat damage due to grazing:
    - Manage grazing leases to ensure that the area is not over-grazed; and
    - Use fencing to keep cattle out of environmentally sensitive areas.
7. Monitor the condition of cottonwood-willow riparian habitats to assess the effectiveness of protective measures (e.g., fencing).
8. Develop a monitoring program to assess the status of Bendire's thrasher in Kelso Valley.

5.0 REPORT PREPARATION AND REFERENCES

5.1 REPORT PREPARATION

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5.2 REFERENCES

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APPENDIX A. BUTTERBREDT SPRINGS BIRD SPECIES CHECKLIST

Checklist downloaded from: http://www.natureali.org/checklists/butterbredtbirdchecklist.htm

Species	Spring	Summer	Fall	Winter	Nesting
Wood Duck	●				
Mallard	●				
Blue-winged Teal	●				
Cinnamon Teal	●	●			
Bufflehead					
Mountain Quail	●	●			x
California Quail	●	●	●	●	x
Chukar	●	●	●		x
Eared Grebe					
Double-crested Cormorant					
American White Pelican					
American Bittern		●			
Great Blue Heron	●				
Great Egret	●				
Snowy Egret	●				
Cattle Egret	●				
Green Heron	●	●			
Black-crowned Night-Heron	●				
White-faced Ibis	●				
Turkey Vulture	●	●			
Osprey	●				
Bald Eagle			●		
Northern Harrier	●			●	
Sharp-shinned Hawk	●		●		
Cooper's Hawk	●		●		x
Zone-tailed Hawk	●				
Red-tailed Hawk	●	●	●	●	x
Red-shouldered Hawk					
Swainson's Hawk					
Broad-winged Hawk					
Rough-legged Hawk	●				
Golden Eagle	●	●	●	●	x
American Kestrel	●	●			x
Merlin	●		●		
Peregrine Falcon	●	●			
Prairie Falcon	●				x
Virginia Rail	●	●			

Appendix A. Butterbredt Springs Bird Species Checklist *Page 26*

Species	Spring	Summer	Fall	Winter	Nesting
Sora	●				
American Coot				●	
Killdeer	●				
Spotted Sandpiper	●				
Solitary Sandpiper	●				
Greater Yellowlegs	●				
Lesser Yellowlegs					
Western Sandpiper	●				
Least Sandpiper	●				
Long-billed Dowitcher	●				
Wilson's Snipe	●				
Wilson's Phalarope	●				
Red-necked Phalarope					
California Gull	●				
Ring-billed Gull				●	
Rock Pigeon	●				
Band-tailed Pigeon	●	●			
Eurasian Collared-Dove	●	●			
Spotted Dove		●			
White-winged Dove	●				
Mourning Dove	●	●	●		x
Common Ground-Dove	●				
Yellow-billed Cuckoo		●			
Greater Roadrunner	●	●	●		x
Barn Owl	●	●	●		
Flammulated Owl	●				
Great Horned Owl	●	●	●	●	x
Northern Pygmy-Owl		●	●		
Long-eared Owl	●	●			x
Northern Saw-whet Owl	●				
Burrowing Owl	●				
Common Poorwill	●	●			x
Lesser Nighthawk					
Common Nighthawk					
Black Swift	●				
Vaux's Swift	●				
White-throated Swift	●	●	●		x
Black-chinned Hummingbird	●	●	●		
Anna's Hummingbird	●	●	●		x
Costa's Hummingbird	●	●			x
Rufous Hummingbird	●		●		

Appendix A. Butterbredt Springs Bird Species Checklist *Page 27*

Species	Spring	Summer	Fall	Winter	Nesting
Calliope Hummingbird	●				
Belted Kingfisher	●				
Acorn Woodpecker	●	●	●		
Williamson's Sapsucker			●		
Yellow-bellied Sapsucker			●		
Red-naped Sapsucker	●		●		
Red-breasted Sapsucker	●				
Ladder-backed Woodpecker	●	●	●	●	x
Nuttall's Woodpecker	●	●	●		x
Downy Woodpecker	●	●	●		
Hairy Woodpecker	●				
Northern Flicker	●	●	●		x
White-headed Woodpecker					
Olive-sided Flycatcher	●	●			
Western Wood-Pewee	●	●	●		
Alder Flycatcher	●				
Willow Flycatcher	●	●	●		
Hammond's Flycatcher	●	●	●		
Gray Flycatcher	●	●			
Dusky Flycatcher	●	●			
Pacific-slope Flycatcher	●	●	●		
Black Phoebe	●	●	●		x
Say's Phoebe	●	●			x
Vermilion Flycatcher	●				
Ash-throated Flycatcher	●	●	●		x
Brown-crested Flycatcher	●				?
Cassin's Kingbird	●				
Western Kingbird	●	●	●		x
Scissor-tailed Flycatcher	●				
Loggerhead Shrike	●	●	●		x
White-eyed Vireo	●				
Bell's Vireo	●				?
Yellow-throated Vireo	●	●			
Plumbeous Vireo	●				
Cassin's Vireo	●	●	●		
Blue-headed Vireo	●				
Hutton's Vireo	●				
Warbling Vireo	●	●	●		
Red-eyed Vireo	●	●			
Philadephia Vireo					
Pinyon Jay	●	●	●	●	

Appendix A. Butterbredt Springs Bird Species Checklist *Page 28*

Species	Spring	Summer	Fall	Winter	Nesting
Western Scrub-Jay	●		●		
American Crow	●		●		
Common Raven	●	●	●		x
Stellar's Jay					
Clark's Nutcracker	●		●		
Horned Lark	●	●			
Purple Martin					
Northern Rough-winged Swallow	●				
Tree Swallow	●				
Violet-green Swallow	●				
Bank Swallow	●				
Barn Swallow	●	●	●		
Cliff Swallow	●	●			
Mountain Chickadee	●				
Oak Titmouse			●		x
Verdin	●		●		
Bushtit	●	●			x
Red-breasted Nuthatch	●	●	●		
White-breasted Nuthatch					
Brown Creeper					
Cactus Wren	●	●	●	●	x
Rock Wren	●	●	●	●	x
Canyon Wren			●		
Bewick's Wren	●	●	●	●	x
House Wren	●	●	●		x
Pacific Wren		●			
Marsh Wren	●		●		
Blue-gray Gnatcatcher	●	●	●		x
Black-tailed Gnatcatcher	●				
Golden-crowned Kinglet					
Ruby-crowned Kinglet	●	●	●	●	
Mountain Bluebird	●				
Western Bluebird	●				
Townsend's Solitaire	●		●		
Swainson's Thrush	●	●			
Hermit Thrush	●	●	●		
American Robin	●	●	●		
Varied Thrush	●	●		●	
Gray Catbird	●	●			
Northern Mockingbird	●	●	●		x

Appendix A. Butterbredt Springs Bird Species Checklist *Page 29*

Species	Spring	Summer	Fall	Winter	Nesting
Sage Thrasher	●				
Bendire's Thrasher	●	●			x
California Thrasher	●	●	●		x
Le Conte's Thrasher	●	●	●		x
European Starling	●	●			x
American Pipit			●		
Cedar Waxwing	●	●			
Phainopepla	●	●	●		x
Ovenbird	●	●	●		
Worm-eating Warbler	●	●			
Northern Waterthrush	●	●			
Golden-winged Warbler	●				
Blue-winged Warbler	●	●			
Black-and-white Warbler	●	●			
Prothonotary Warbler					
Tennessee Warbler	●	●			
Orange-crowned Warbler	●	●	●		
Nashville Warbler	●	●	●		
Connecticut Warbler		●			
MacGillivray's Warbler	●	●	●		
Mourning Warbler	●				
Kentucky Warbler	●	●			
Common Yellowthroat	●	●	●		x
Hooded Warbler	●	●			
American Redstart	●	●	●		
Northern Parula	●	●			
Magnolia Warbler	●	●			
Bay-breasted Warbler	●				
Blackburnian Warbler	●	●			
Yellow Warbler	●	●	●		
Chestnut-sided Warbler	●	●			
Blackpoll Warbler	●				
Black-throated Blue Warbler	●	●			
Palm Warbler	●				
Yellow-rumped Warbler	●	●	●	●	
Yellow-throated Warbler	●	●			
Prairie Warbler	●				
Black-throated Gray Warbler	●	●	●		
Townsend's Warbler	●	●	●		
Hermit Warbler	●	●	●		
Black-throated Green Warbler	●				

Appendix A. Butterbredt Springs Bird Species Checklist *Page 30*

Species	Spring	Summer	Fall	Winter	Nesting
Canada Warbler	●				
Wilson's Warbler	●	●	●		
Painted Redstart	●	●			
Yellow-breasted Chat	●	●			
Green-tailed Towhee	●	●			
Spotted Towhee	●	●	●		
Rufous-crowned Sparrow			●		
California Towhee	●	●	●	●	x
Chipping Sparrow	●	●	●		
Clay-colored Sparrow	●				
Brewer's Sparrow	●	●	●		x
Black-chinned Sparrow	●	●			x
Vesper Sparrow	●				
Lark Sparrow	●	●	●		x
Black-throated Sparrow	●	●	●		x
Sage Sparrow	●	●	●		x
Savannah Sparrow	●				
Fox Sparrow	●	●	●		
Song Sparrow	●	●			
Lincoln's Sparrow	●	●	●		
Swamp Sparrow					
White-throated Sparrow	●				
Harris's Sparrow	●				
White-crowned Sparrow	●	●	●		
Golden-crowned Sparrow	●	●	●		
Dark-eyed Junco	●		●		
Summer Tanager	●	●			
Western Tanager	●	●	●		
Rose-breasted Grosbeak	●	●			
Black-headed Grosbeak	●	●	●		
Blue Grosbeak	●	●			
Lazuli Bunting	●	●	●		
Indigo Bunting	●	●			
Red-winged Blackbird	●	●	●	●	x
Tricolored Blackbird	●	●			
Western Meadowlark	●	●	●	●	x
Yellow-headed Blackbird	●				
Brewer's Blackbird	●	●			x
Great-tailed Grackle	●	●			
Common Grackle					
Brown-headed Cowbird	●	●	●		

Appendix A. Butterbredt Springs Bird Species Checklist *Page 31*

Species	Spring	Summer	Fall	Winter	Nesting
Orchard Oriole	●				
Hooded Oriole	●	●	●		x
Bullock's Oriole	●	●	●		x
Baltimore Oriole	●				
Scott's Oriole	●	●	●		x
Purple Finch	●		●		
Cassin's Finch	●				
House Finch	●	●	●		x
Red Crossbill	●				
Pine Siskin	●	●			
Lesser Goldfinch	●	●	●		x
Lawrence's Goldfinch	●	●			x
American Goldfinch	●				
Evening Grosbeak	●				
House Sparrow	●	●			

Observations from: Butterbredt Christmas Bird Counts, eBird records, and records of the Kern County Field Ornithologists. Andrew Howe, Alison Sheehey, Bob Barnes, David Blue, Dave Goodward, John Wilson, Jim Danzenbaker, Keith Axelson, Kelli Levinson, Michael McQuerrey, Matt Heindel, John Schmitt, Susan Steele, Steve Summers, Steve Terrill, Tom Wurster, and Vernon Howe.

APPENDIX B. POINT COUNT AND BROADCAST SURVEY DATA SHEETS

Point Count Data Form

Observer: _____ Date: _____

Time: _____ Weather: _____

Point #: _____

Time	Species	Distance (if ≤ 75 m)	Distance (if ≥ 75 m)

Le Conte's Thrasher Survey Data Form

Observer: _____

Date	Time	Point #	Distance	Direction	Weather (temp, cloud cvr., wind)

Additional notes on back.

Bendire's Thrasher Survey Data Form

Observer: _____

Date	Time	Point #	Distance	Direction	Weather (temp, cloud cvr., wind)

Additional notes on back

APPENDIX H

SPECIAL-STATUS WILDLIFE SURVEYS FOR [RENU] RESOURCES PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA

Biosearch Associates

SPECIAL-STATUS WILDLIFE SURVEYS FOR RENEWABLE RESOURCES* PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA

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Santa Cruz, CA 95061
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4 October 2012

*Note: The landowner of record is ReNu Resources, LLC.
For purposes of this report, Renewable Resources Group = ReNu Resources, LLC.

SPECIAL-STATUS WILDLIFE SURVEYS FOR RENEWABLE RESOURCES PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA

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Cover photo by Mark Allaback: Adult Mohave ground squirrel, APN 153-130-05, 24 April 2012.

SPECIAL-STATUS WILDLIFE SURVEYS FOR RENEWABLE RESOURCES PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA

EXECUTIVE SUMMARY

The California Department of Parks and Recreation Off-Highway Motor Vehicle Recreation (OHMVR) Division proposes to acquire a ~28,500-acre property in northeastern Kern County historically known as Onyx Ranch. The Renewable Resources Group purchased the property in 2008. TRA Environmental Sciences, Inc. (TRA) is preparing an Environmental Impact Report (EIR) for the acquisition project. Onyx Ranch, which is undeveloped and used primarily to graze cattle, consists of flat to mountainous terrain supporting several habitat types that transition from desert scrub at lower elevations in the east to pinyon-juniper woodland at higher elevations in the west. The property consists of 60 parcels arranged in a "checkerboard" pattern of ownership. Most of the interspersed parcels are owned by the U.S. Bureau of Land Management (BLM) and used for off-highway vehicle (OHV) use. The majority of the Renewable Resources property is located within the Jawbone-Butterbredt Area of Critical Environmental Concern.

Biosearch Associates was contracted by TRA to conduct live-trapping surveys for the Mohave ground squirrel (*Xerospermophilus mohavensis*) to provide data for the EIR. The Mojave ground squirrel, which is listed as Threatened under the California Endangered Species Act, is restricted to portions of Kern, Inyo, San Bernardino and Los Angeles counties. Live-trapping was also conducted in 2012 for four special-status small mammals that are known from the region: Tehachapi pocket mouse (*Perognathus alticola inexpectatus*), yellow-eared pocket mouse (*P. parvus xanthonotus*), San Joaquin pocket mouse (*P. inornatus inornatus*) and Tulare grasshopper mouse (*Onychomys torridus tularensis*). Motion-activated game cameras and Visual Encounter Surveys (VES) for sign were conducted to detect American badger (*Taxidea taxus*) and desert kit fox (*Vulpes macrotis arsipus*). All of these species are afforded special status by either the California Department of Fish and Game (CDFG) or the BLM.

In 2012, diurnal live-trapping was conducted at 18 sites to sample appropriate Mohave ground squirrel habitat in the northeastern portion of Onyx Ranch. Each site was sampled with a 100-trap (24.5-acre) grid for five consecutive days. Mohave ground squirrels were captured at 10 if 18 locations. Twenty-five individuals (17 female, 8 male) were captured. The number of individuals captured per grid ranged from 1 to 8.

Results from the present study indicate that the Mohave ground squirrel is widespread in the northeastern part of Onyx Ranch as far west as Butterbredt Canyon. The species was trapped in Creosote Scrub, Mohave Mixed Woody Scrub, Blackbush Scrub and Joshua Tree Woodland. The 2012 survey effort did not sample areas of steep terrain or rocky soils. Although Mohave ground squirrels are not generally considered to occur in these habitats, juveniles may traverse such areas during dispersal. Although Kelso Valley is generally considered to be outside the range of the Mohave ground squirrel, suitable

habitat is present, and the species is present in adjacent Butterbredt Canyon. Additional live-trapping studies are therefore recommended to confirm presence on the Renewable Resources parcels in Kelso Valley that provide potential habitat.

Dietary overlap between Mohave ground squirrels and cattle has been demonstrated, and the degree of overlap increases during dry years. Cattle have been shown to preferentially feed on winterfat, a species that also makes up a large part of the diet of the Mohave ground squirrel in some areas.

Although Mohave ground squirrels are known persist in other areas that receive OHV use, the activity reduces the diversity of annuals and forbs that provide forage for the species. More research is needed to determine the level of OHV activity that the species can tolerate and still sustain reproducing populations. Restricting OHV use to existing open areas and established roads is recommended, in order to maintain appropriate plant diversity to sustain Mohave ground squirrel populations.

Nocturnal live-trapping for special-status small mammals was also conducted in 2012. No special-status small mammals were captured although potential habitat is present for the Tehachapi pocket mouse and yellow-eared pocket mouse in the western part of the site. The San Joaquin pocket mouse is expected only on those parcels in the Caliente Creek watershed in the southwestern corner of the study area. The southern grasshopper mouse was captured at 17 of the 18 sites sampled. However, the subspecies *tularensis* (a CDFG Species of Special Concern) and *pulcher* (a common, widespread subspecies) have both been reported from the project area. Genetic analysis is needed to clarify taxonomic affiliations of the southern grasshopper mice onsite.

American badger was detected on six parcels and desert kit fox on two parcels in the extreme east portion of the study area. Neither species was detected by game cameras. However, the camera-stations were likely not in operation for long enough to collect sufficient data on wide-ranging carnivores such as badger or desert kit fox.

Several other special-status species were observed or detected by sign incidentally to focused surveys. Evidence of Agassiz's desert tortoise (*Gopherus agassizii*), listed as threatened under both state and federal Endangered Species Acts, was found at five locations. The following special-status avian species were observed: loggerhead shrike (*Lanius ludovicianus*) (15 sites), LeConte's thrasher (*Toxostoma lecontei*) (five sites), golden eagle (*Aquila chrysaetos*) (four sites) and prairie falcon (*Falco mexicanus*) (two sites). Special-status migrants included northern harrier (*Circus cyaneus*) (two sites), Swainson's hawk (*Buteo swainsoni*) (one site), osprey (*Pandion haliaetus*) (one site), black swift (*Cypseloides nigra*) (two sites) and Vaux's swift (*Chaetura vauxi*) (two sites).

Disturbances observed at the 18 study locations included OHV trails and roads, many of which had been closed and some that were undergoing restoration. Evidence of use by cattle was widespread. Other disturbed or barren areas were mostly localized as a result of camping, shooting or concentrating cattle. Most of the study area appeared relatively undisturbed and supported a diverse wildlife assemblage.

SPECIAL-STATUS WILDLIFE SURVEYS FOR RENEWABLE RESOURCES PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA

INTRODUCTION

This document provides the results of field surveys for the Mohave ground squirrel (*Xerospermophilus mohavensis*) and other special-status vertebrates as part of the Renewable Resources Acquisition Project located on Onyx Ranch in northeastern Kern County, California. Onyx Ranch is currently owned by the Renewable Resources Group based in Los Angeles, CA, but is expected to be purchased by the Off-Highway Motor Vehicle Recreation (OHMVR) Division of California State Parks (State Parks). The property consists of all or portions of 60 U.S. Geological Survey (USGS) sections, covering approximately 28,500 acres, which generally do not share common borders and are spread across a large region in a "checkerboard" pattern interspersed with Bureau of Land Management (BLM) lands. Since the land transfer will require an Environmental Impact Report (EIR), TRA Environmental Sciences (TRA; Menlo Park, CA) was hired by the OHMVR Division of State Parks to author an EIR in support of the Renewable Resources Property Acquisition Project. Biosearch Associates was contracted by TRA to conduct field studies that targeted the Mohave ground squirrel, since it is listed as Threatened under the California Endangered Species Act, as well as other special-status vertebrates including the Tehachapi pocket mouse, yellow-eared pocket mouse, San Joaquin pocket mouse, desert kit fox and American badger.

Onyx Ranch lands are mostly undeveloped although there is an extensive dirt road system that passes through or near most of the parcels. In addition, there is fencing and limited water development to facilitate cattle grazing. In many areas the public may pass through the private parcels using designated dirt roads to reach surrounding lands managed by the BLM and the Friends of Jawbone Canyon, a nonprofit corporation based in Cantil, CA, that receives private donations primarily from OHV enthusiasts. In addition to cattle grazing, portions of the project site are influenced by regular OHV use and nearby camping, particularly in proximity to the Dove Springs area in the north and Jawbone Canyon in the south. Visitation rates increase significantly on the weekends, especially during cooler months.

A preliminary special-status wildlife habitat assessment noted that ~30 of the 60 parcels provided potential habitat for the Mohave ground squirrel, extending from Dove Springs on the north to Jawbone Canyon on the south and from Kelso Valley on the west to near Highway 14 just outside the east edge of the study area (Biosearch Associates 2011). Field work in 2012 sampled 18 of these sites, all in the northeastern part of the study area.

Suitable habitat for numerous other special-status vertebrates was identified on Renewable Resources lands (Biosearch Associates 2011). For purposes of this document, special-status wildlife species include the following: those listed by the U.S.

Fish and Wildlife Service (USFWS) as Threatened or Endangered; species for which the USFWS has sufficient information to list as Endangered or Threatened, but for which listing is precluded (Candidate Species); those species for which a proposed rule to list as Endangered or Threatened has been published by USFWS (Proposed species); species listed by the USFWS as Birds of Conservation Concern (in Regions 32 or 33); species designated by the Bureau of Land Management as Sensitive; species designated by the U.S. Forest Service as Sensitive; species listed by the California Fish and Game Commission as Threatened or Endangered and those species that are Candidates for listing as Threatened or Endangered; species designated by the California Department of Fish and Game (CDFG) as Species of Special Concern; species listed as "fully protected" in the California Fish and Game Code, and species designated as protected furbearers under the California Code of Regulations.

Field surveys in 2012 were designed to detect a subset of these species including the Tehachapi pocket mouse (*Perognathus alticola inexpectatus*), yellow-eared pocket mouse (*P. parvus xanthonotus*), San Joaquin pocket mouse (*P. inornatus inornatus*), Tulare grasshopper mouse (*Onychomys torridus tularensis*), desert kit fox (*Vulpes macrotis arsipus*) and American badger (*Taxidea taxus*). Surveys for these species were conducted concurrently with Mohave ground squirrel studies.

Incidental observations of additional special-status species were also recorded including Agassiz's desert tortoise (*Gopherus agassizii*) and several special-status birds. Focused surveys for Agassiz's desert tortoise were performed by Leatherman BioConsulting, Inc. (Yorba Linda, CA) and reported separately. Focused studies for special-status birds and rare plants were conducted by TRA in 2012.

STUDY AREA

The Renewable Resources acquisition project site is situated northwest of California City in eastern Kern County along the west edge of the Mojave Desert. The general project site is bounded by Jawbone Canyon on the south, Highway 14 and Red Rock Canyon State Park on the east, Dove Springs Canyon on the north and the Piute Mountains on the west. The majority of Onyx Ranch is located within the Jawbone-Butterbredt Area of Critical Environmental Concern (ACEC). Elevations range from 2,170 feet above sea level at the mouth of Jawbone Canyon along the northwest edge of the Mojave Desert to 7,700 feet on Sorrell Peak in the Piute Mountains in the western part of the site. The site is located at the transition between the Mojave Desert and the eastern slope of the Sierra Nevada, and the vegetation communities are also influenced by proximity to the Great Basin.

The property consists of all or portions of 60 U.S. Geological Survey (USGS) parcels, covering approximately 28,500 acres, which generally do not share common borders and are spread across a large region in a "checkerboard" pattern interspersed with BLM lands.

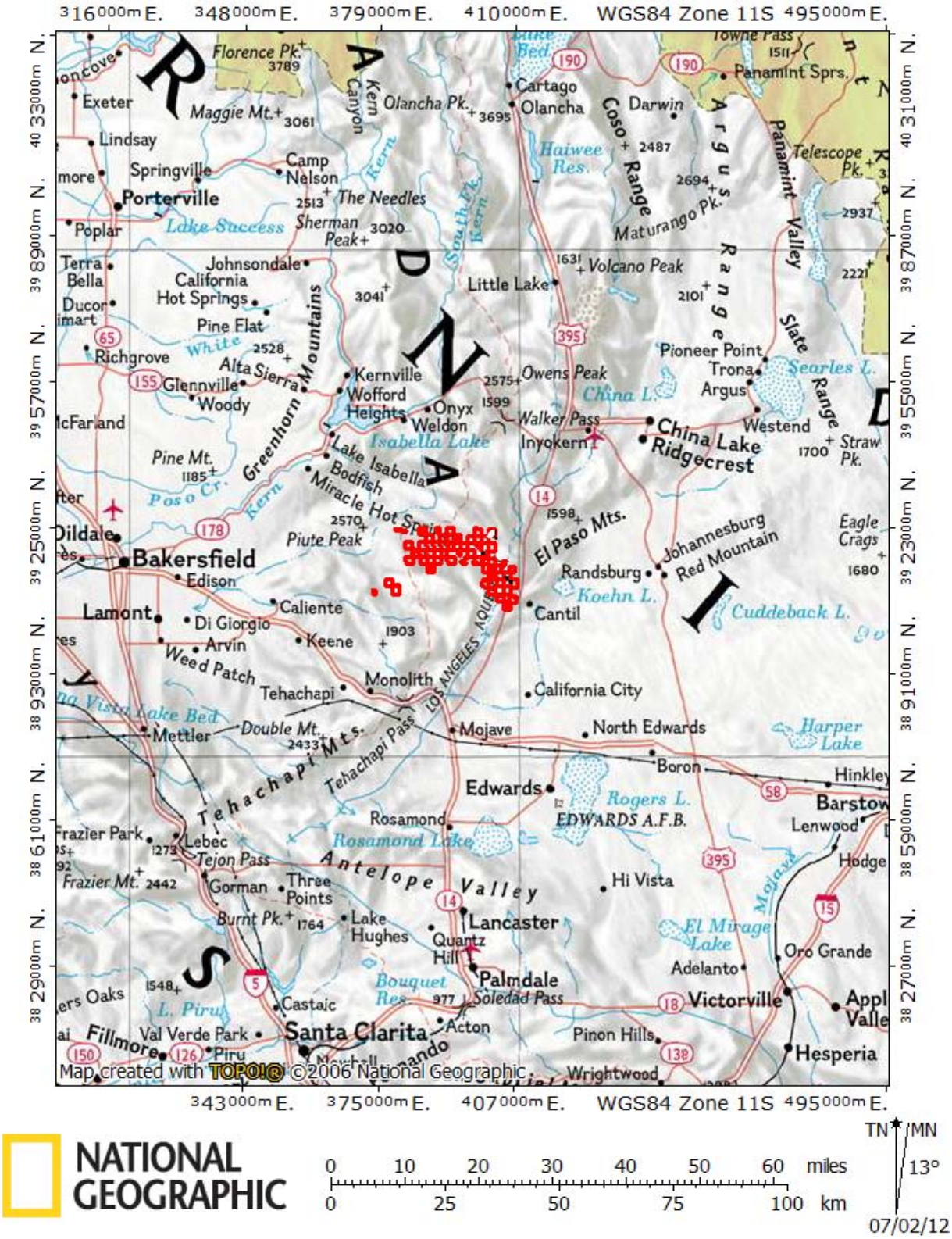

Figure 1. Regional Location of Onyx Ranch Acquisition Project.

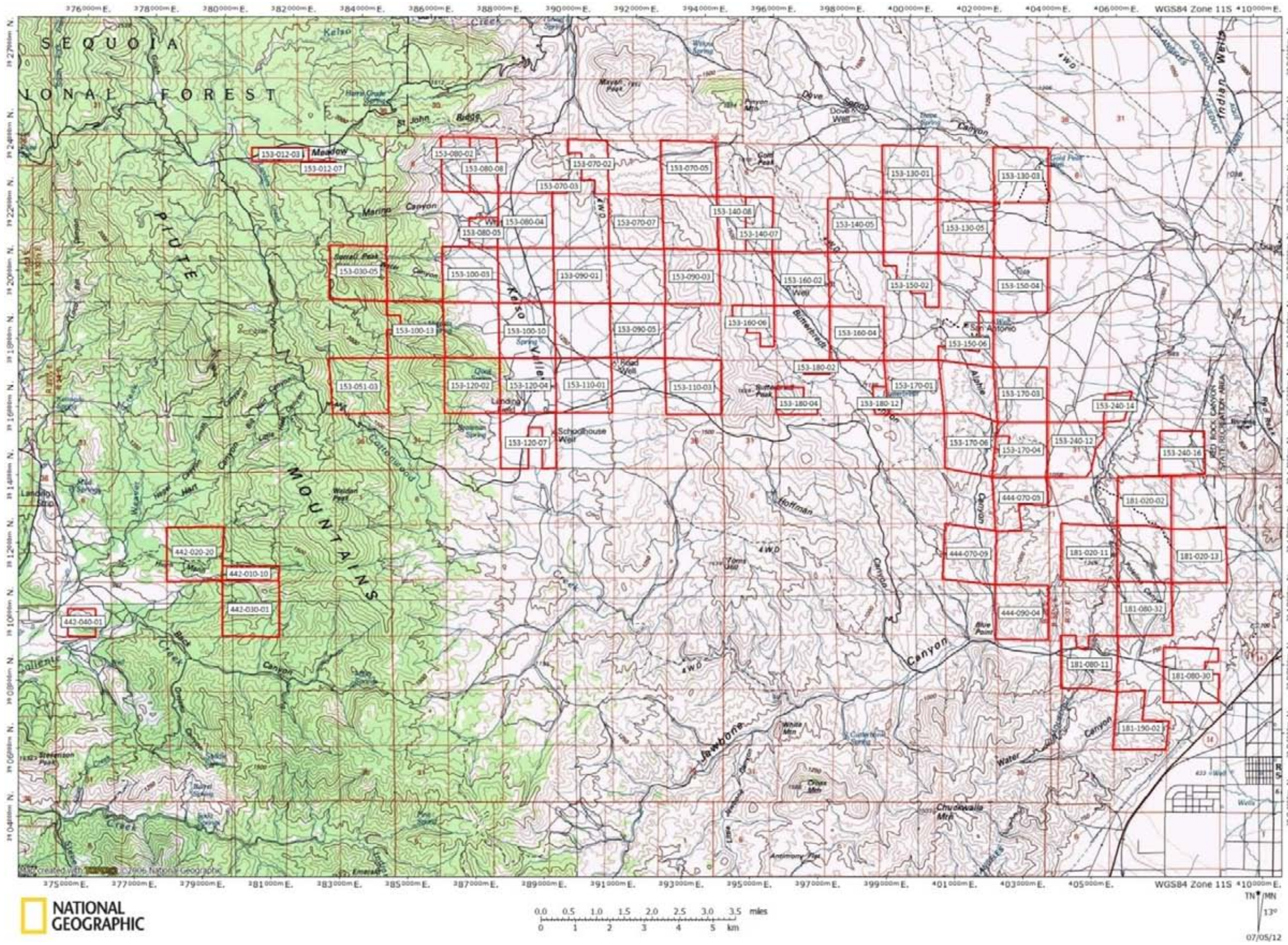

Figure 2. Onyx Ranch Acquisition Project Parcel Numbers.

SPECIES ACCOUNTS

Mohave Ground Squirrel (*Xerospermophilus mohavensis*)

The Mohave ground squirrel occupies portions of Inyo, Kern, Los Angeles and San Bernardino counties in the western Mojave Desert. The species ranges from near Palmdale on the southwest to Lucerne Valley on the southeast, Olancha on the northwest and the Avawatz Mountains on the northeast (Gustafson 1993; Leitner 2008b). Although the species likely occupied the Antelope Valley historically, widespread conversion of native habitats has apparently resulted in its extirpation west of Palmdale and Lancaster.

The Mohave ground squirrel is a medium-sized ground squirrel that measures 8.3”- 9.1” in total length (Hall 1981). There is little difference in size between the sexes. Dorsal coloration is uniformly light gray or brown, often with a wash of cinnamon or pink, while ventral coloration is creamy. The ears are small and eyelids are white. *X. mohavensis* can be distinguished from *X. tereticaudus* by a shorter, flatter tail with a white ventral surface and brown rather than white cheeks. It is significantly larger than *X. tereticaudus* in most cranial measurements (Best 1995).

Mohave ground squirrels feed on a variety of foods, but primarily on the leaves and seeds of forbs and shrubs. The diet varies greatly over the course of a season. Leaves of perennial shrubs make up a large part of the diet and are consumed with greater frequency when annual plants are not available. If herbaceous annuals are present, Mohave ground squirrels forage on their leaves, flowers, seeds and/or pollen. Invertebrates are consumed regularly but make up a relatively small proportion of the diet. Shrub species that were consumed most often at a study area in Coso area were winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*) and saltbush (*Atriplex* sp.) (Leitner and Leitner 1998). However, it is not known if these results can be extrapolated to the more southerly portions of the species' range.

The Mohave ground squirrel exhibits a strongly seasonal cycle of activity and torpor. It typically emerges from hibernation in early- to mid-March (Leitner and Leitner 1998). Males typically emerge up to two weeks prior to females (Best 1995). Once a sufficient amount of fat has been accumulated in late spring or early summer, individuals enter a period of aestivation and hibernation (Bartholomew and Hudson 1961). Aestivation generally begins anytime between July and September, but during drought conditions, may begin as early as April or May (Leitner, et al. 1995).

Adults are generally solitary except during breeding, which occurs soon after emergence from hibernation. Gestation lasts 29-30 days and litter size is between four and nine (Best 1995). Juveniles emerge from natal burrows within four to six weeks. Females will breed at one year of age if environmental conditions are appropriate, while males do not normally mate until two years of age (Leitner and Leitner 1998). The reproductive success of the Mohave ground squirrel is dependent on the amount of fall and winter rains. A positive correlation between fall and winter precipitation and recruitment of juveniles the following year has been demonstrated (Leitner and Leitner 1998).

Following low rainfall, annual herbaceous plants are not readily available, and the species may forego breeding entirely (Leitner and Leitner 1998).

Mohave ground squirrels may maintain several home burrows that are used at night, as well as accessory burrows that are used for temperature control and predator avoidance. The aestivation burrow is dug specifically for use during the summer and winter period of dormancy (Best 1995). Burrows are often constructed beneath large shrubs (Leitner, et al. 1995). Home ranges of adults vary between years and throughout a season, presumably as a result of variation in quantity and quality of food resources. Juveniles are gregarious and initially stay close to the natal burrow. Typically in June, juveniles begin making exploratory movements away from the natal burrow and some individuals eventually disperse (Brylski, et al. 1998). Radio-telemetry data suggest that females are more likely than males to remain in the vicinity of their natal burrows. For eleven tagged juveniles, the average distance moved from the natal burrow was 1.1 miles, and the maximum distance moved was 3.9 miles (Harris and Leitner 2005). Long-distance movement by juveniles may be critical for re-colonizing sites after local extirpations (Harris and Leitner 2005).

The Mohave ground squirrel occupies habitats described by Holland (1986) as Mojave Creosote Scrub, Desert Saltbush Scrub, Desert Sink Scrub, Desert Greasewood Scrub, Shadscale Scrub, Mojave Mixed Woody Scrub and Joshua tree woodland (Gutafson 1993). The Mohave ground squirrel inhabits flat to moderate terrain and is not generally found in steep contours. However, juveniles can apparently traverse steep terrain during dispersal (Harris and Leitner 2005). The species has been found most frequently in sandy, alluvial soils but is also found in gravelly and occasionally rocky soils but is not known to occupy areas of desert pavement (Wessman 1977; Zembal and Gall 1980; Aardahl and Rousch 1985; Best 1995).

The project site is at the western edge of known Mohave ground squirrel range (Leitner 2008). The Natural Diversity Data Base (CNDDB) maintained by CDFG has records from Jawbone Canyon, Dove Spring Canyon, Butterbredt Canyon and Red Rock Canyon State Park, although all of these observations are from the 1970s. More recent records are known from Little Dixie Wash (Leitner 2008), Red Rock Canyon (Leitner 2008a, 2009, 2010) and from Dove Springs Canyon (BLM, pers. comm.).

Tehachapi Pocket Mouse (*Perognathus alticola inexpectatus*)

The Tehachapi pocket mouse is one of two subspecies of the white-eared pocket mouse (*P. alticola*) currently recognized (Hall 1981; Williams, et al. 1993; Best 1994). *P. a. inexpectatus* occupies the Tehachapi Mountains from Tehachapi Pass southwest towards Gorman, as far west as Cuddy Valley near Mount Pinos, and east along the lower slopes of the San Gabriel Mountains to Elizabeth Lake (Williams, et al. 1993). The other subspecies, *P. a. alticola*, is known only from the San Bernardino Mountains and has not been observed for more than fifty years (Williams 1986). The specific epithet *alticolus* was constructed incorrectly by Rhoads (1894), and continues to be used by some authors. The correct Latin form is *alticola*, as used by Osgood (1900) and explained by Williams,

et al. (1993), and is the form followed herein. The Tehachapi pocket mouse is designated as a Species of Special Concern by CDFG. The nearest known record of the Tehachapi pocket mouse is from near Tehachapi, ~15 miles SSW of Onyx Ranch.

The Tehachapi pocket mouse is medium-sized for the genus, averaging 5.9" and 6.5" total length for females and males, respectively (Best 1993b). Males are significantly larger than females for most external and cranial measurements (Best 1994). Coloration is yellowish-brown heavily overlaid with black dorsally and whitish ventrally. The inside of the ears are whitish, the patch at the base of the ear is white, and the ear pinna possesses a lobed antitragus. The tail is bicolored, measures slightly more than the head-body length, and is crested along the distal one-third.

The Tehachapi pocket mouse occupies native and non-native grasslands, Joshua tree woodland, pinyon-juniper woodland, yellow pine woodland and oak savannah (Williams, et al. 1993). It has been captured in open pine forests at higher elevations (Huey 1926), in chaparral and coastal sage communities at lower elevations, and in rangeland and fallow grain fields (Best 1994). Elevations of known occurrences range between 3,500 and 6,000 feet.

There is little information regarding the ecology of the Tehachapi pocket mouse. It constructs burrows in loose, sandy soils (Zeiner et al. 1990). Most other members of the genus exhibit seasonal hibernation (Verts and Kirkland 1988), and it is expected that *P. a. inexpectatus* does as well. *P. a. inexpectatus* exists in disjunct subpopulations. Given these factors, the subspecies can be difficult to detect.

San Joaquin Pocket Mouse (*Perognathus inornatus inornatus*)

The San Joaquin pocket mouse is endemic to California and occurs in the Sacramento and San Joaquin Valleys, the interior Coast Ranges, the foothills of the Sierra Nevada and Tehachapi Mountains, and the western Mojave Desert (Best 1993a; Williams, et al. 1993). The species is currently comprised of 3 subspecies (*inornatus*, *neglectus*, and *psammophilus*). The taxonomy of the group is unresolved and there is compelling evidence to suggest that the 2 forms found in the San Joaquin Valley (*inornatus* and *neglectus*) represent distinct species, based in part on differing chromosome complements (Best 1993a; Williams, et al. 1993). P. *inornatus* from the western Mojave Desert have been assigned to the subspecies *neglectus* based on similar structure (Williams, et al. 1993). The subspecies *inornatus* occurs along the eastern edge of the San Joaquin and Sacramento Valleys and south into the Tehachapi Mountains. The subspecies *inornatus* has lost much of its historic range in the San Joaquin Valley as the result of agricultural and urban development and is listed as a Sensitive Species by the Bureau of Land Management. The nearest known record of the San Joaquin pocket mouse is from near Twin Oaks, approximately 2.5 miles SW of the southwestern part of Onyx Ranch.

The pelage of *P. inornatus* is soft and without bristles. The dorsal coloration is ochraceous buff to pinkish overlaid with black. The ventral coloration is whitish. A fulvous lateral line is generally distinct. The subauricular spots are distinct and buffy to

white. A faint to obvious black crescent is present on the nose. The feet are white and the soles covered with sparse hairs. Juvenile dorsum pelage is gray and whitish ventrally. The tail is white or slightly bicolored and without a crest. The tail averages 102 to 107% of the head/body length.

The San Joaquin pocket mouse inhabits annual grassland, saltbush scrub and oak savanna habitats, generally on friable soils (Williams 1986). Like other member of the species complex, it is typically found in low frequencies relative to other co-occurring rodents. It feeds primarily on the seeds of annuals, shrubs and forbs, but will also consume insects when seeds are less available (Best 1993). It forages almost exclusively at night and spends the day in a simple burrow. The species enters torpor during periods of low temperatures and/or low food availability and is not active above ground during much of the winter (Best 1993a).

Yellow-eared Pocket Mouse (*Perognathus parvus xanthonotus*)

The yellow-eared pocket mouse inhabits the eastern slopes of the Piute Mountains and Sierra Nevada at elevations between 4,000-5,300 feet. The subspecies has been recorded between Kelso Valley on the south and Sand Canyon on the north (Hall 1981; Laabs, et al. 1990; Williams, et al. 1993). The yellow-eared pocket mouse was collected from the head of Kelso Valley in 1911 (CNDDB 2012; MVZ 2012). Its presence in this area was re-confirmed in 1983 (Brylski, et al. 1998). The yellow-eared pocket mouse is designated as Sensitive by the Bureau of Land Management.

The yellow-eared pocket mouse was first described as a full species, *Parvus xanthonotus* (Grinnell 1912), and has been treated as such by many subsequent authors (Ingles 1965; Hall 1981; Verts & Kirkland 1988; Nowak 1991; Zeiner, et al. 1990). However, based on morphological and karyological similarities, *P. xanthonotus* is not sufficiently differentiated from *P. parvus* and the most recent review of the taxonomy of the species includes it as a subspecies of *P. parvus* (Williams, et al. 1993).

The yellow-eared pocket mouse is a large-sized member of the genus, averaging approximately 6.5 inches in total length. The pelage is ochraceous buff, slightly overlaid with black dorsally. The feet and under-parts are white. The inside of the ear is whitish, and a conspicuous spot at the base of the ear is white. The ear possesses a lobed antitragus. The ochraceous lateral line and dark facial markings are faint. The tail is faintly bicolored, ending in a small tuft, and slightly longer than the length of the head and body.

The subspecies has been found in Joshua tree woodland, desert scrub, pinyon-juniper, mixed and montane chaparral, sagebrush and bunchgrass habitats (Grinnell 1912; Williams, et al. 1993). It occurs primarily in sandy soils with sparse to moderate shrub cover (Zeiner, et al. 1990). Elevations of known localities range between 1030-1615 m (3380-5300 feet; Hall 1981; Zeiner, et al. 1990; CNDDB 2012).

There is little specific information regarding the ecology of the yellow-eared pocket mouse. *P. parvus* generally reproduces between March and September, normally producing a single litter each year. Reproduction may be curtailed in dry years. *P. parvus* generally forages on seeds and fruit of a variety of grasses, annuals, forbs and shrubs. Seeds are cached during the spring and summer to provide food during the winter months. Insects may also be part of the diet, at least seasonally (Ingles 1965; Verts and Kirkland 1988). It presumably hibernates like other members of the species group hibernate during the winter (Zeiner, et al. 1990). The species is difficult to detect due to its seasonal surface activity and patchy distribution.

Tulare Grasshopper Mouse (*Onychomys torridus tularensis*)

The Tulare grasshopper mouse is one of 10 subspecies of the southern grasshopper mouse, *Onycbonys torridus*, currently recognized (McCarty 1975; USFWS 1997). The subspecies *tularensis* was historically distributed in the southern San Joaquin Valley from eastern San Benito County east to Madera County and south to the Tehachapi Mountains (USFWS 1997). It is designated as a Species of Special Concern by CDFG.

Grasshopper mice are short-tailed and stocky with a dorsal pelage that varies widely from pale brown to grayish or pinkish cinnamon. The pelage is distinctly bicolored, and the underparts are white.

There is little specific information regarding natural history attributes of the Tulare grasshopper mouse. The diet of other subspecies of the southern grasshopper mouse is made up largely of arthropods and small mammals (McCarty 1975). The species is typically found in low densities.

The Tulare grasshopper mouse occurs primarily in the southern San Joaquin Valley. However, there are also scattered records to the east, including a record from Kelso Valley (MVZ 15190), Red Rock Canyon (LACM 87830) and Freeman Junction (LACM 63674). The subspecies *pulcher* is widespread in the western Mojave Desert, including several records from Kelso Valley, Red Rock Canyon and Dove Springs. *O. t. tularensis* can be distinguished from adjacent subspecies by its slightly darker dorsal coloration and smaller size (Brylski, et al. 1998). However, within species variation in pelage color may result from adaptations to local conditions (McCarty 1975).

American Badger (*Taxidea taxus*)

The American badger occurs throughout much of western North America (Long 1973). Badgers inhabit a variety of open habitats including annual grassland, scrub and savanna habitats (Zeiner, et al. 1991). It was once a widespread resident throughout much of California but within the last century populations have declined as the result of predator and rodent control programs, road-kills and habitat conversion (Williams 1986). The American badger is listed as a Species of Special Concern list by CDFG. The species has been observed at Red Rock Canyon State Park, immediately east of Onyx Ranch.

Badgers feed primarily on fossorial rodents such as gophers and ground squirrels, although they will eat a variety of available live prey (Williams 1986). They are powerful diggers and excavate burrows for den sites as well as during foraging activities. Burrows are often re-used, although some individuals may dig new burrows each night (Long 1973).

Desert Kit Fox (*Vulpes macrotis arsipus*)

The desert kit fox is one of two subspecies of *Vulpes macrotis* currently recognized (Mercure et al. 1993). The subspecies *arsipus* occurs in desert and semi-arid regions of southwestern United States and central Mexico. The desert kit fox is designated as a Protected Furbearer under the California Fish and Game Code and the California Code of Regulations.

The desert kit fox is closely associated with steppe and desert habitats. It typically occupies open shrub habitats including habitats dominated by Creosote, saltbush, greasewood and sage brush. Shrub density is typically low. Desert kit fox are almost exclusively carniverous and will prey on kangaroo rats, rabbits, ground squirrels and other small mammals, birds, reptiles and insects, depending on their availability (McGrew 1979). They are primarily nocturnal and remain in dens during the day. Coyotes are a primary predator of the closely related San Joaquin kit fox (USFWS 2010).

METHODS

Mohave Ground Squirrel Trapping

A preliminary special-status wildlife habitat assessment identified ~30 parcels that supported potential Mohave ground squirrel habitat (Biosearch 2011). Live-trapping was conducted at 18 of these parcels in 2012, primarily in the northeastern portion of the project area (Figure 3). Although initially the survey points were selected randomly, several locations were adjusted to ensure grids were placed entirely on the parcel or to avoid roads regularly used by the public. Locations were generally within 100-300 meters of a road, which was necessary to facilitate set-up and maintenance. Finally, some grids were adjusted within a parcel to sample microhabitats that appeared more suitable for the target species based on vegetation and topography.

Live-trapping for Mohave ground squirrels was conducted by wildlife biologists Mark Allaback, David Laabs, Caleb Murphy and Chad Steiner under authority of a Memorandum of Understanding with CDFG and appropriate Scientific Collecting Permit authorizations. Trapping procedures followed current CDFG survey protocols, with the exception that only one 5-day trapping session was conducted at each site rather than the three, 5-day trapping sessions required to report a negative finding (CDFG 2003).

Each parcel was sampled with a 100-trap grid, arranged in a 10 x 10 pattern. Sherman™ XLK traps (12" x 3" x 3.75") were used. Each trap was covered with a cardboard shelter (18" x 24") arranged in an "A-frame" to provide shade. Traps and shelters were orientated north-south and numbered. Trap spacing was 35 meters, so each grid covered 9.9 hectares (~24.5 acres). Each grid was monitored for five consecutive days. Traps were baited with "sweet feed" (oats, corn, molasses and other grains). Traps were monitored throughout the day, checked at least once every four hours to minimize heat stress to captured animals, and left open to sample nocturnal rodents.

Trapping was conducted during the weeks of 26 March, 9 April, 23 April, 7 May and 21 May 2012 (Table 1). Based on the below-average precipitation received in the region during the preceding winter, Mohave ground squirrels were not expected to be reproductive, so late-season (June and early July) trapping for juveniles was not scheduled. Trapping was conducted as early in the spring as the weather would allow in order to target adults while they were still active above ground. Given the wide range of elevations included within the study area, the grids at the lowest elevations were trapped in late March, with progressively higher-elevation grids sampled through April and May.

Each ground squirrel captured was identified to species, marked with non-toxic ink and the time, trap number, age (adult or juvenile), sex, reproductive condition, and any notes regarding unusual or abnormal circumstances were recorded. For each Mohave ground squirrel, weight (in grams) and standard measurements (length of head and body, tail, ear and hind-foot in millimeters) were also recorded. Each Mohave ground squirrel was individually numbered using non-toxic ink and the capture location was recorded.

Table 1. Survey locations and dates for Mohave ground squirrel trapping at Onyx Ranch, 2012. Habitats: BBS=Blackbush Scrub; CRSC=Creosote Scrub; JTW=Joshua Tree Woodland; MMWS=Mixed Mohave Woody Scrub.

APN	TRA Site #	BA Site #	Habitat	Elev (ft)	Investigator	Start Date	End Date
153-070-05	38	11	BBS; JTW	5320	C. Murphy	5/7/2012	5/11/2012
153-130-01	177	14	BBS; JTW	4540	C. Murphy	4/23/2012	4/27/2012
153-130-03	58	9	BBS; JTW	3970	M. Allaback	4/23/2012	4/27/2012
153-130-05	62	4	MMWS; BBS	4110	C. Steiner	4/23/2012	4/27/2012
153-140-05	59	17	BBS; JTW	4840	M. Allaback	5/21/2012	5/25/2012
153-140-07	60	10	BBS; JTW	4670	C. Steiner	5/7/2012	5/11/2012
153-150-02	63	16	BBS; JTW	4500	C. Murphy	5/21/2012	5/25/2012
153-150-04	64	3	BBS	3960	D. Laabs	4/23/2012	4/27/2012
153-150-06	68	8	MMWS; BBS	3870	C. Steiner	4/9/2012	4/12/2012
153-160-02	65	12	BBS; JTW	4480	M. Allaback	5/7/2012	5/11/2012
153-160-04	67	13	BBS; JTW	4250	D. Laabs	5/7/2012	5/11/2012
153-170-03	70	6	BBS	3760	M. Allaback	4/9/2012	4/12/2012
153-240-12	79	7	CRSC	3530	D. Laabs	4/9/2012	4/12/2012
153-240-14	78	15	CRSC	3410	C. Murphy	4/9/2012	4/12/2012
153-240-16	80	0	CRSC	3090	M. Allaback	3/26/2012	3/30/2012
181-020-02	81	5	CRSC; MMWS	3130	C. Steiner	3/26/2012	3/30/2012
181-020-13	83	2	CRSC	2640	D. Laabs	3/26/2012	3/30/2012
181-080-32	84	1	CRSC	2740	C. Murphy	3/26/2012	3/30/2012

Nocturnal Trapping for Special-status Small Mammals

Four consecutive nights of live-trapping were conducted at each of the 18 parcels, using the same grids established for the Mohave ground squirrel. Traps were closed if rain or temperatures below 40°F were forecast. Traps were supplemented with a mixture of oats, bird seed and peanut butter. All vertebrates captured were identified to species, marked with nontoxic ink, and sex, age and reproductive condition were recorded. Standard measurements (length of head and body, tail, ear and hind-foot in mm) and weight (g) were only recorded as necessary for diagnostic purposes.

Transect Surveys

Visual Encounter Surveys (VES) were conducted in the vicinity of each of the 18 trapping grids. If possible, transects started at edge of the trapping grid. Eight 500-meter transects were walked in association with each site. All special-status species observed or detected by sign (dens, scat, tracks or other evidence) were recorded. Human-related disturbances were also tallied including OHV tracks, trails, roads, fence-lines, litter, dumping, shooting and evidence of livestock.

Camera Surveys

Two motion-activated game cameras (Reconyx HC500 Hyperfire and/or Moultrie Model M100) were operated for four consecutive nights at each of the 18 grids (Figure 4). Cameras were baited with cat food and with "sweet feed" to attract ground squirrels. The cameras were placed between 100 and 500 meters from each of the grids. Cameras were oriented north to reduce direct disturbance from sunlight and checked no more than once daily. Micro-habitats were selected that favor predators such as paths, washes, rocky outcrops and Joshua tree woodland. Predator scat or tracks were often nearby. The location of each camera-station was recorded. Photos were reviewed for presence of vertebrates, which were tallied for each station. Relative abundance was expressed as the number of detections per camera-night.

Incidental Observations

During the course of implementing the focused surveys detailed above, all detections of special-status vertebrates were recorded and a vertebrate species list was maintained associated with each USGS Section or partial section selected as a sample site. Data collected from each study area was used to provide a list of all animals observed or detected by sign during the field study.

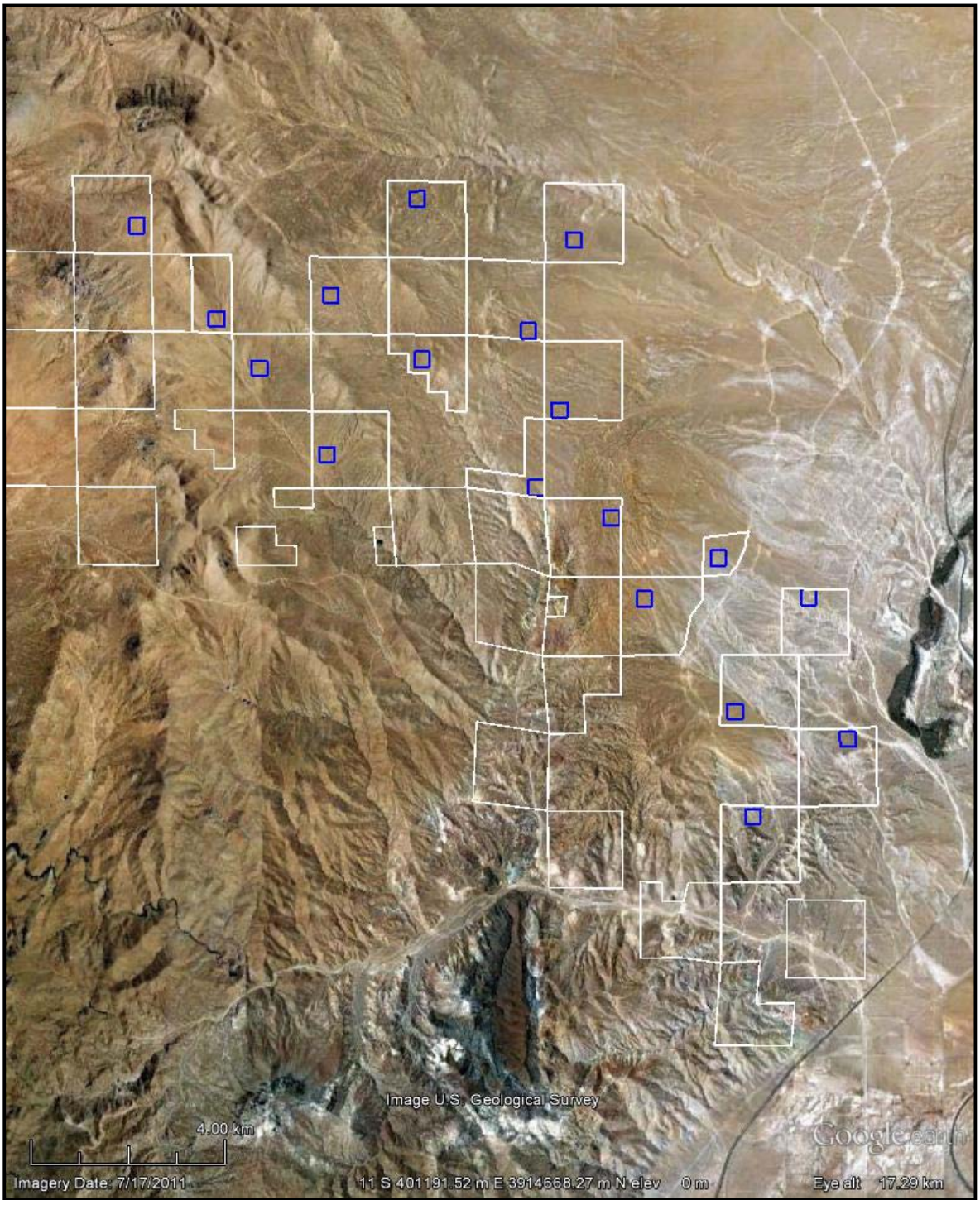

Figure 3. Aerial image of eastern portion of Renewable Resources Property showing trapping grids sampled in 2012 (blue squares).

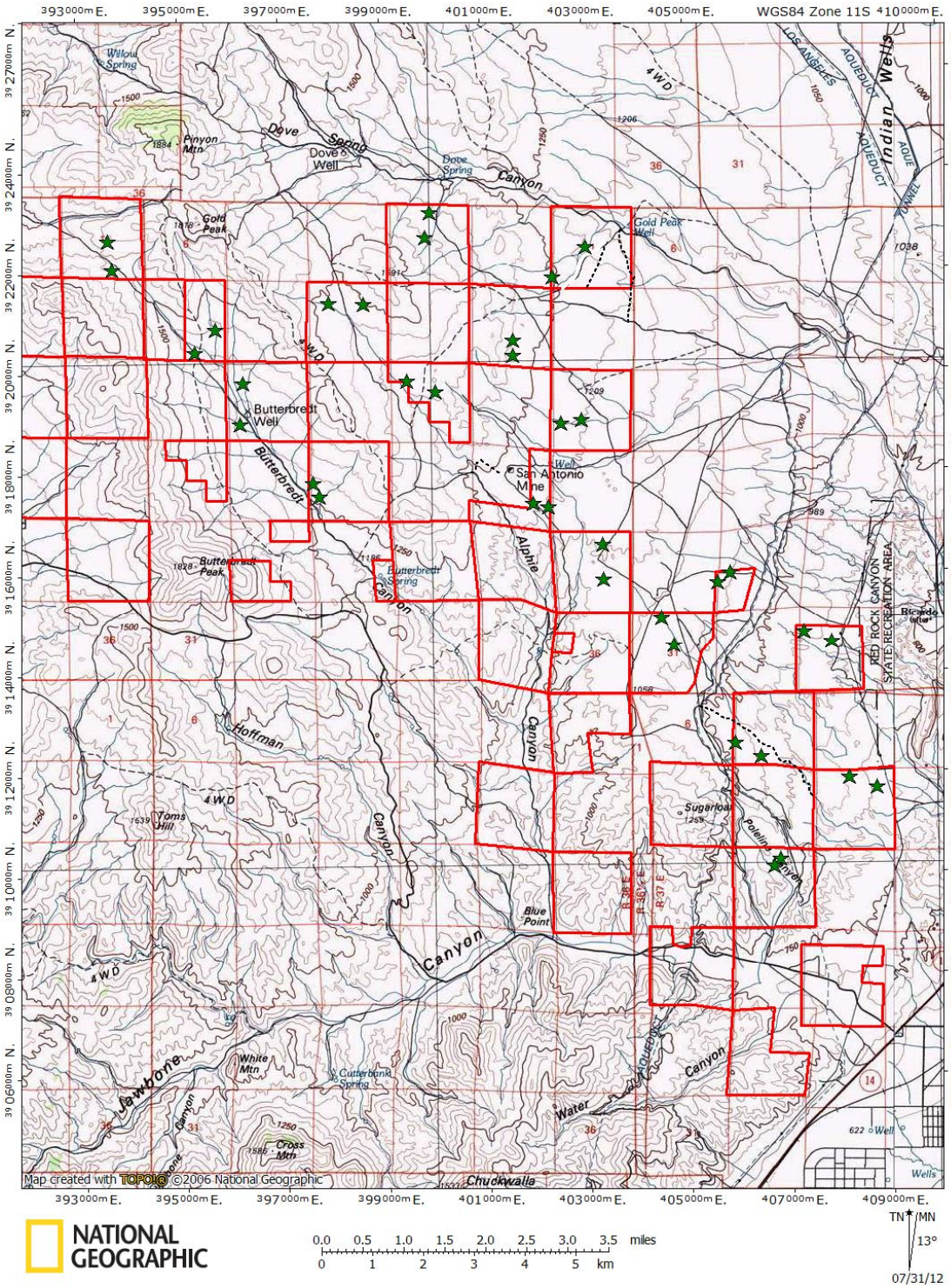

Figure 4. Locations of photo stations for Renewable Resources Property Acquisition Project in 2012.

RESULTS

Mohave Ground Squirrel Trapping

Traps were opened for five consecutive days at 14 of the sites and four consecutive days at four sites (due to rain) for a total of 8,600 trap-days. Mohave ground squirrels were captured at 10 of the 18 sites sampled (Table 2). Twenty-five individuals (17 female, 8 male) were captured. The number of individuals per grid ranged from 1 to 8. Of the 25 individuals, 8 were captured only once, while seven were recaptured once, three were recaptured twice, four were recaptured on three occasions, two were recaptured four times, and one five times.

All Mohave ground squirrel captured were adults and none showed signs of reproductive activity. All individuals appeared healthy. Males were significantly heavier ($\overline{X}$ = 164.0 g) than females ($\overline{X}$ = 137.1 g), although the sample size for males was much smaller than for females. Average weights of females increased over the course of the study (R^2=0.37) (Figure 4).

Table 2. Number of Mohave ground squirrels captured (500 trap-days on 24.5-acre grid) at Onyx Ranch in 2012. * = Sites trapped for 400 trap-days due to weather.

Site #	Adult Females	Adult Males	Total Adults	# Recaptures
153-070-05	0	0	0	-
153-130-01	0	2	2	1
153-130-03	5	3	8	21
153-130-05	3	1	4	6
153-140-05	1	0	1	3
153-140-07	1	0	1	0
153-150-02	0	0	0	-
153-150-04	1	1	2	1
153-150-06*	1	0	1	0
153-160-02	0	0	0	-
153-160-04	0	0	0	-
153-170-03*	0	0	0	-
153-240-12*	2	1	3	2
153-240-14*	2	0	2	4
153-240-16	0	0	0	-
181-020-02	1	0	1	0
181-020-13	0	0	0	-
181-080-32	0	0	0	-
Total	17	8	25	38

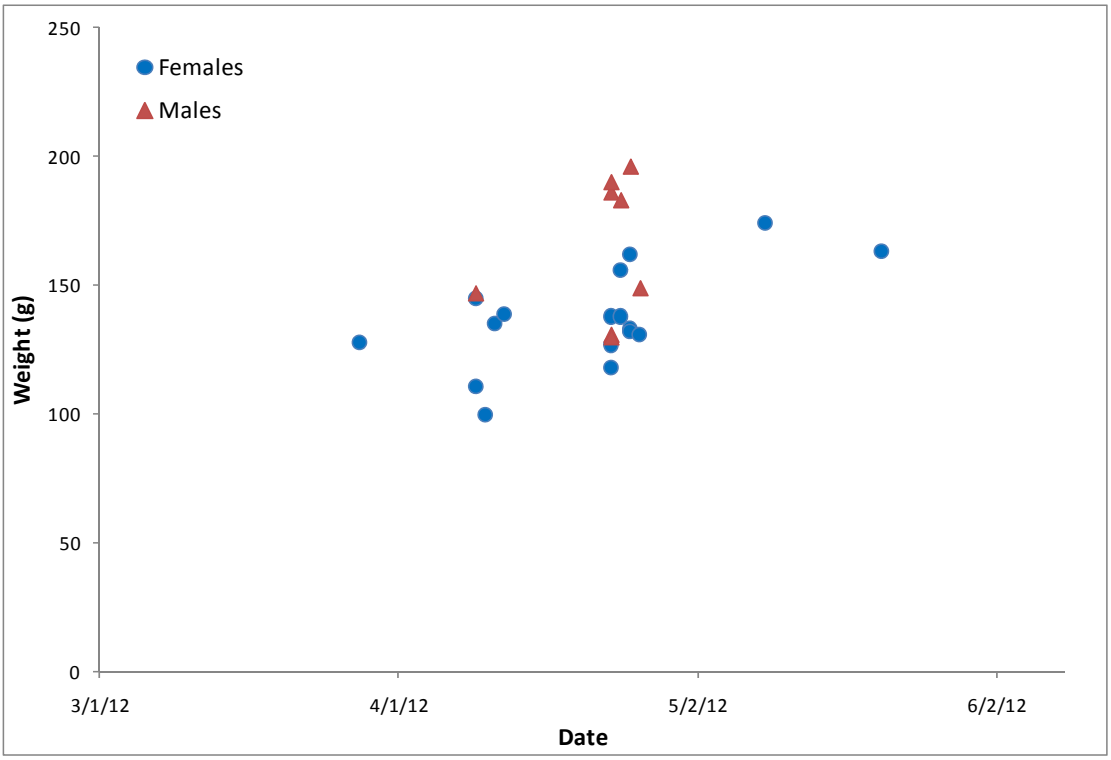

Figure 5. Mass (in grams) of Mohave ground squirrels by date captured at Onyx Ranch, 2012.

White-tailed antelope ground squirrels (*Ammospermophilus leucurus*) were captured on all 18 study sites (Appendix B). The number of individuals ranged from 22 to 51 per grid. Juvenile antelope ground squirrels were captured on only five grids in mid- to late-May. Other species captured incidentally in live traps were desert spiny lizard (*Sceloperus magister*), coachwhip (*Masticophus flagellum*), desert cottontail (*Sylvilagus audubonii*), white-crowned sparrow (*Zonotrichia leucophrys*) and black-headed grosbeak (*Pheucticus melanocephalus*).

Nocturnal Trapping for Other Special-status Vertebrates

Trapping for nocturnal rodents was conducted for four nights at 10 sites and for three nights (due to rain) at 8 sites for a total of 6,400 trap-nights. Ten species of nocturnal rodents were captured: Panamint kangaroo rat (*Dipodomys panamintinus*), Merriam's kangaroo rat (*Dipodomys merriami*), great basin kangaroo rat (*Dipodomys microps*), long-tailed pocket mouse (*Chaetodipus formosus*), little pocket mouse (*Perognathus longimembris*), desert woodrat (*Neotoma lepida*), grasshopper mouse (*Onychomys torridus*), canyon mouse (*Peromyscus crinitus*), deer mouse (*Peromyscus maniculatus*) and pinyon mouse (*Peromyscus truei*) (Table 3).

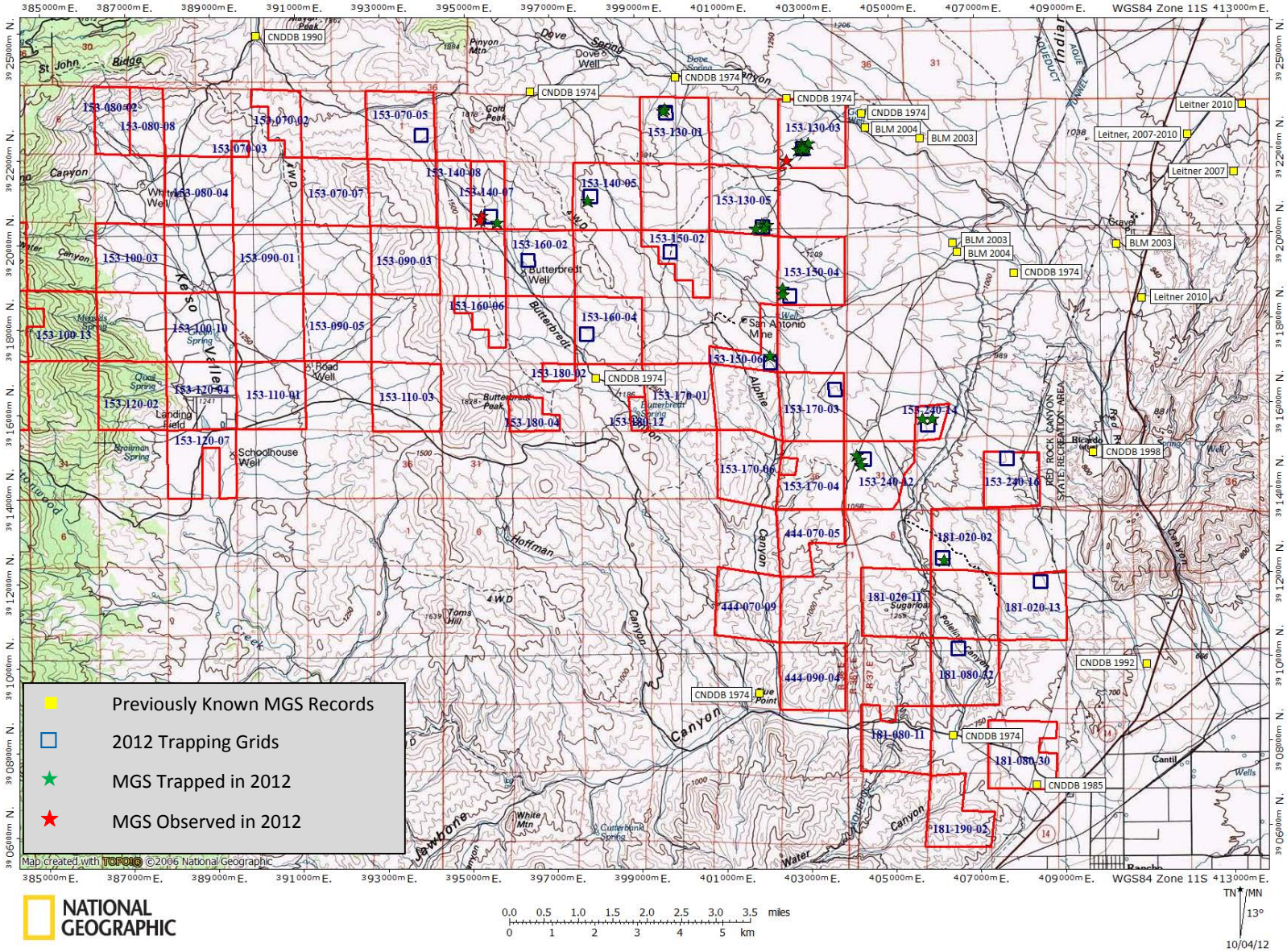

Figure 6. Results of Mohave ground squirrel surveys for Renewable Resources Acquisition Project in 2012.

Table 3. Results of nocturnal small mammal trapping for Renewable Resources property acquisition project, 2012. Relative abundance is # of individuals per 100 trap-nights.

APN	*Dipodomys merriami*	*Dipodomys microps*	*Dipodomys panamintinus*	*Chaetodipus formosus*	*Perognathus longimembris*	*Neotoma lepida*	*Onychomys torridus*	*Peromyscus crinitus*	*Peromuscus maniculatus*	*Peromyscus truei*	Species Richness	# Individuals	Relative Abundance
153-070-05	3	0	72	0	7	2	4	0	22	5	7	115	28.75
153-130-01	0	0	110	0	1	11	2	0	21	0	5	145	48.33
153-130-03	1	0	82	5	0	20	9	3	23	3	8	146	48.67
153-130-05	2	0	101	1	3	8	1	0	15	0	7	131	43.67
153-140-05	0	0	66	0	1	10	6	0	25	2	6	110	27.50
153-140-07	0	0	70	0	4	9	8	0	18	4	6	113	28.25
153-150-02	0	0	72	0	3	13	1	2	25	1	7	117	29.25
153-150-04	4	0	118	0	6	3	3	0	1	0	6	135	45.00
153-150-06	9	0	114	0	0	6	4	0	28	0	5	161	53.67
153-160-02	0	0	81	0	9	11	3	0	15	0	5	119	33.75
153-160-04	4	0	98	0	1	2	3	0	27	0	6	135	29.75
153-170-03	7	0	106	0	2	2	4	0	20	0	6	141	47.00
153-240-12	14	0	102	0	1	0	2	0	23	0	5	142	47.33
153-240-14	43	0	96	2	0	1	1	0	13	0	6	156	52.00
153-240-16	65	0	31	6	0	4	10	0	43	0	6	159	39.75
181-020-02	28	0	83	9	0	9	0	0	92	0	5	221	55.25
181-020-13	69	0	95	2	1	0	3	0	29	0	6	199	49.75
181-080-32	50	2	87	12	0	5	2	0	50	0	7	208	52.00
# Individuals	299	2	1584	37	39	116	66	5	490	15		2653	42.20
% Individuals	11.3	0.1	59.7	1.4	1.5	4.4	2.5	0.2	18.5	0.6			
# Grids	13	1	18	7	12	16	17	2	18	5			
% Grids	72.2	5.6	100.0	38.9	66.7	88.9	94.4	11.1	100.0	27.8			

Species richness of nocturnal small mammals ranged from five to eight species per grid. Overall, 2,653 individuals were captured. Relative abundance (new individuals per 100 trap-nights) ranged between 27.50 and 55.25.

Two species (Panamint kangaroo rat and deer mouse) were captured on every grid, and accounted for 59.1% and 18.47% of all individuals, respectively. Merriam's kangaroo rat was captured frequently in the eastern part of the study area and less frequently as elevations increased. Overall, it was captured on 13 of the 18 grids and accounted for 11.3% of all individuals. Little pocket mouse, southern grasshopper mouse and desert woodrat were widespread (> 50% of all grids) but detected in relatively low numbers (1% to 5% of all individuals). Four other species were captured relatively infrequently: the

great basin kangaroo rat was present on a single grid at the eastern edge of the project area, the canyon mouse was captured at two grids characterized by large rock outcrops, the pinyon mouse was captured at five grids at higher elevations in dense Joshua tree woodland, and the long-tailed pocket mouse was captured at seven grids in the eastern part of the study area.

Camera Surveys

A total of 144 camera-nights were conducted at the 18 sample sites. The only mammalian predators detected were coyote (*Canis latrans*) and bobcat (*Lynx rufus*). No American badgers or desert kit fox were detected. Other species detected at camera stations included white-tailed antelope ground squirrel, black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), Panamint kangaroo rat, California quail (*Callipepla californica*), chukar (*Alectoris chukar*), greater roadrunner (*Geococcyx californianus*), cactus wren (*Campylorhynchus brunneicapillus*) and northern mockingbird (*Mimus polyglottos*).

Transect Surveys and Incidental Observations

Several special-status species were observed during standardized visual transects or while working on trapping grids, maintaining camera stations and driving onsite (Table 4). Evidence of desert tortoise was observed on five of the parcels (Table 5). Scat was observed on APN 153-150-04, 153-170-03, 153-240-12 and 153-240-16, while skeletal remains were observed on APN 153-240-16 and 181-080-32.

Mohave ground squirrels were observed in two localities in proximity to the trapping grid on APN 153-140-07 and detected by call near the trapping grid on APN 153-130-03. Probable observations at two locations on 153-160-04 in Butterbredt Canyon could not be confirmed.

Evidence of American badger (scat, dens, digging) was detected on six parcels: 153-130-03, 153-160-02, 153-170-03, 153-240-14, 153-240-16 and 181-020-13. These sites are scattered throughout the study area, reflecting a widespread but seemingly low-density distribution in the area. Evidence of desert kit fox (scat) was detected in only two sites (APN 153-240-12 and 153-240-16) in the eastern part of the project area.

Loggerhead shrikes were widespread and present at 15 of 18 study sites (Table 4). LeConte's thrashers were observed at five sites and a nest was found on APN 153-130-05. Five special-status raptors were observed: golden eagle (*Aquila chrysaetos*) (four sites), prairie falcon (*Falco mexicanus*) (two sites), northern harrier (*Circus cyaneus*) (two sites), Swainson's hawk (*Buteo swainsoni*) (one site) and osprey (*Pandion haliaetus*) (one site). The latter three raptors were considered migrants. Black swifts (*Cypseloides niger*) and Vaux's swift (*Chaetura vauxi*) were also seen flying over two sites during migration.

Table 4. Special-status wildlife observed or detected by sign at Onyx Ranch, 2012.

APN	Desert Tortoise Sign	Osprey	Northern Harrier	Swainson's Hawk	Golden Eagle	Prairie Falcon	Loggerhead Shrike	Black Swift	Vaux's Swift	LeConte's Thrasher	Kit Fox Sign	American Badger Sign
153-070-05							X	X				
153-130-01				X			X	X				
153-130-03							X					X
153-130-05			X		X		X			X		
153-140-05					X							
153-140-07							X		X			
153-150-02							X			X		
153-150-04	X											
153-150-06							X		X	X		
153-160-02							X					X
153-160-04					X		X			X		
153-170-03	X						X			X		X
153-240-12			X		X		X				X	
153-240-14							X					X
153-240-16	X					X	X				X	X
181-020-02												
181-020-13	X	X				X	X					X
181-080-32	X						X					

DISCUSSION AND RECOMMENDATIONS

The Renewable Resources Acquisition Project includes ~28,500 acres of a property historically known as Onyx Ranch in northeastern Kern County, California. The site is at the western edge of the range of the Mohave ground squirrel, a species listed as Threatened under the California Endangered Species Act. An initial habitat assessment identified ~30 Renewable Resources parcels that support potential Mohave ground squirrel habitat (Biosearch 2011). Live-trapping was conducted at 18 of these parcels in 2012, primarily in the northeastern portion of the project area, to ascertain the general distribution of the species. Although the 2012 trapping effort did not follow current CDFG survey protocols for the species (a single 5-day trapping session was conducted rather than three 5-day trapping sessions), the methodology was intended to sample a large area and to direct future sampling efforts, and was not intended to establish absence from specific parcels.

Mohave ground squirrels were present at 10 of 18 sites sampled in the northeastern part of Onyx Ranch. A total of 25 adults were captured, and three other individuals were detected in proximity to trapping grids. For a variety of reasons, Mohave ground squirrels may be difficult to detect, but the number of individuals coupled with the high recapture rate suggest that the 2012 season was ideal to conduct live-trapping for adult Mohave ground squirrels throughout the study area. Large-scale studies conducted in other portions of the species' range in 2012 also noted relatively high capture rates (Leitner, pers. comm.).

As expected, given the lack of rainfall during the preceding winter, none of the Mohave ground squirrels trapped showed evidence of reproductive activity and no juveniles were trapped. Individual body mass covered a wide range (100 to 196 grams) throughout the season, which indicated that different age classes were present (Leitner, et al. 1995). The four years prior to 2012 provided sufficient rainfall to allow for successful reproduction of the species range-wide (Leitner, pers. comm.; Laabs and Allaback, pers. obs.). The high ratio of females to males trapped in 2012 (2.1:1) is consistent with results from other studies, which have shown ratios from 1.3:1 to 7:1 (Leitner and Leitner 1998).

Results from the present study indicate that the Mohave ground squirrel is widespread in the northeastern part of Onyx Ranch as far west as Butterbredt Canyon. The species was trapped in Creosote Scrub, Mixed Mohave Woody Scrub, Blackbush Scrub and Joshua Tree Woodland. The 2012 survey effort did not sample areas of steep terrain or rocky soils. Although Mohave ground squirrels are not generally considered to occur in these habitats, juveniles may traverse such areas during dispersal (Harris and Leitner 2005).

Although Kelso Valley is generally considered to be outside the range of the Mohave ground squirrel, suitable habitat is present, and the species is present in adjacent Butterbredt Canyon. A Mohave ground squirrel was observed in 1990 at the intersection of Kelso Valley Road and Butterbredt Canyon Road (CNDDB 2012), approximately one mile north of Onyx Ranch. Additional live-trapping studies are therefore recommended

to confirm presence on those Renewable Resources parcels in Kelso Valley that provide potential habitat.

Dietary overlap between Mohave ground squirrels and cattle has been demonstrated (Leitner et al. 1995). The degree of overlap increases during dry years. In the Coso region, cattle preferentially fed on winterfat, a shrub species that also made up a large part of the diet of the Mohave ground squirrel (Leitner et al. 1995).

Although Mohave ground squirrels are known persist in other areas that receive OHV use, the activity reduces the diversity of available forage (Leitner 2010). More research is needed to determine the level of OHV activity that the species can tolerate and still sustain reproducing populations. Restricting OHV use to existing established roads is recommended, in order to maintain appropriate plant diversity to sustain Mohave ground squirrel populations.

No special-status pocket mice were captured during 6,400 trap-nights. Habitat within the areas sampled did not appear suitable for the Tehachapi pocket mouse, which is most often associated with grassland, chaparral, oak savannah and yellow pine forest. Portions of the property at higher elevations (Butterbredt Canyon, upper Alphie Canyon, Kelso Valley) appear to provide suitable habitat for the yellow-eared pocket mouse. Habitat for the San Joaquin pocket mouse, a species designated as Sensitive by the Bureau of Land Management, is limited to the parcels in the Caliente Creek watershed in the southwestern corner of the site.

The southern grasshopper mouse (*Onychomys torridus*), was present throughout the area sampled and was captured on 17 of the 18 sites sampled. Both *O. t. tularensis* (a CDFG Species of Special Concern) and *O. t. pulcher* (a common, widespread subspecies) have been reported from the project area (MVZ 2012). Genetic analysis is needed to clarify sub-specific affiliations of the southern grasshopper mice onsite.

The American badger, which is designated as a Species of Special Concern by CDFG, was detected by sign at 6 of the 18 locations sampled. The species has a large home range and no estimate of relative abundance can be made using the data collected. A relatively low number of individuals are likely present, but potential habitat exists throughout much of the project area.

The desert kit fox, which is designated as a protected under the Fish and Game Code of California, was found at only two study sites along the eastern edge of the study area, and it was not detected at the camera stations. However, the cameras were likely not in operation for long enough to collect sufficient data on wide-ranging carnivores such as desert kit fox. Suitable habitat for the species is present in the flatter terrain of the eastern part of the site.

Agassiz's desert tortoise sign was noted on five parcels in the eastern part of the site. Scat was found at four locations. A partially disarticulated carcass was found at one location

and scutes were present on two parcels. Scat was observed at two locations dominated by blackbush scrub, which is a plant community that is not typically associated with tortoise. Focused surveys for tortoise were conducted in 2012 by Leatherman BioConsulting, Inc. and are reported separately.

Several special-status bird species were observed incidentally to 2012 surveys. Loggerhead shrikes were widespread and present at 15 of 18 study sites and nesting was confirmed in several locales. LeConte's thrashers were observed at five sites, with a nest observed at one. Golden eagles were observed at four sites and prairie falcon at two sites. Potential nesting habitat was observed for both special-status raptors in cliffs at higher elevations. Focused surveys for special-status avian species were conducted in 2012 by TRA and are reported separately.

Disturbances observed in and around the 18 study locations included OHV trails and roads, many of which had been closed and some that were undergoing restoration. Evidence of use by cattle was widespread. Other disturbed or barren areas were localized as a result of camping, shooting or concentrating cattle. Very little litter or dumping was observed. Clearly both the BLM and Friends of Jawbone Canyon are actively managing the project area and reducing the incidence of off-trail use. Most of the study area appeared relatively undisturbed and supported a diverse wildlife assemblage.

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Appendix A. Vertebrate species observed or detected by sign in 2012, Renewable Resources Property Acquisition Project, Kern County

Reptilia	**Reptiles**
Testudinidae	Land Tortoises
Gopherus agassizi	Agassiz's desert tortoise
Crotaphytidae	Collared and Leopard Lizards
Gambelia wislizenii	Long-nosed leopard lizard
Phrynosomatidae	Spiny Lizards
Callisaurus draconoides	Zebra-tailed lizard
Sceloporus magister	Desert spiny lizard
Sceloporus occidentalis	Western fence lizard
Uta stansburiana	Side-blotched lizard
Phrynosoma platyrhinos	Desert horned lizard
Xantusiidae	Night Lizards
Xantusia vigilis	Desert night lizard
Teiidae	Whiptails and Their Allies
Aspidoscelis tigris	Western whiptail
Colubridae	Colubrids
Masticophis flagellum	Coachwhip
Salvadora hexalepis	Western patch-nosed snake
Arizona elegans	Glossy snake
Pituophis catenifer	Gopher snake
Viperidae	Vipers
Crotalus oreganus	Western rattlesnake
Crotalus scutulatus	Mohave rattlesnake
Aves	**Birds**
Ardeidae	Herons, Egrets and Bitterns
Ardea alba	Great egret
Cathartidae	New World Vultures
Cathartes aura	Turkey vulture
Pandionidae	Ospreys
Pandion haliaetus	Osprey

Accipitridae	Hawks, Kites and Eagles
Circus cyaneus	Northern harrier
Accipiter cooperii	Cooper's hawk
Buteo jamaicensis	Red-tailed hawk
Buteo swainsoni	Swainson's hawk
Aquila chrysaetos	Golden eagle
Falconidae	Falcons and Caracaras
Falco sparverius	American kestrel
Falco mexicanus	Prairie falcon
Phasianidae	Grouse and Ptarmigans
Alectoris chukar	Chukar (introduced)
Odontophoridae	New World Quail
Callipepla californica	California quail
Columbidae	Pigeons and Doves
Zenaida macroura	Mourning dove
Cuculidae	Cuckoos and Anis
Geococcyx californianus	Greater roadrunner
Strigidae	Typical Owls
Bubo virginianus	Great horned owl
Caprimulgidae	Nightjars
Chordeiles acutipennis	Lesser nighthawk
Phalaenoptilus nuttallii	Common poorwill
Apodidae	Swifts
Cypseloides niger	Black swift
Chaetura vauxi	Vaux's swift
Aeronautes saxatalis	White-throated swift
Trochilidae	Hummingbirds
Calypte costae	Costa's hummingbird
Picidae	Woodpeckers
Picoides scalaris	Ladder-backed woodpecker
Colaptes auratus	Northern flicker
Tyrannidae	Tyrant Flycatchers
Contopus sordidulus	Western wood-pewee
Empidonax wrightii	Gray flycatcher

Empidonax difficilis	Pacific-slope flycatcher
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Myiarchus cinerascens	Ash-throated flycatcher
Tyrannus verticalis	Western kingbird
Laniidae	Shrikes
Lanius ludovicianus	Loggerhead shrike
Vireonidae	Vireos
Vireo gilvus	Warbling vireo
Corvidae	Jays, Magpies and Crows
Aphelocoma californica	Western scrub-jay
Corvus corax	Common raven
Alaudidae	Larks
Eremophila alpestris	Horned lark
Hirundinidae	Swallows
Tachycineta thalassina	Violet-green swallow
Petrochelidon pyrrhonota	Cliff swallow
Hirundo rustica	Barn swallow
Troglodytidae	Wrens
Campylorhynchus brunneicapillus	Cactus wren
Salpinctes obsoletus	Rock wren
Silviidae	Old World warblers and gnatcatchers
Polioptila caerulea	Blue-gray gnatcatcher
Turdidae	Thrushes
Catharus ustulatus	Swainson's thrush
Catharus guttatus	Hermit thrush
Turdus migratorius	American robin
Mimidae	Mimic thrushes
Mimus polyglottos	Northern mockingbird
Oreoscoptes montanus	Sage thrasher
Toxostoma lecontei	LeConte's thrasher
Toxostoma redivivum	California thrasher
Sturnidae	Starlings
Sturnus vulgaris	European starling (introduced)

Bombycillidae	Waxwings
Bombycilla cedrorum	Cedar waxwing
Parulidae	Wood-Warblers
Oreothlypis celata	Orange-crowned warbler
Dendroica coronata	Yellow-rumped warbler
Dendroica nigrescens	Black-throated gray warbler
Dendroica townsendi	Townsend's warbler
Dendroica petechia	Yellow warbler
Oporornis tolmiei	MacGillivray's warbler
Geothlypis trichas	Common yellowthroat
Wilsonia pusilla	Wilson's warbler
Thraupidae	Tanagers
Piranga ludoviciana	Western tanager
Emberizidae	Sparrows
Pipilo chlorurus	Green-tailed towhee
Pipilo maculatus	Spotted towhee
Melozone crissalis	California towhee
Spizella passerina	Chipping sparrow
Spizella breweri	Brewer's sparrow
Amphispiza belli	Sage sparrow
Amphispiza bilineata	Black-throated sparrow
Amphispiza melanocorys	Lark bunting
Passerculus sandwichensis	Savannah sparrow
Zonotrichia leucophrys	White-crowned sparrow
Cardinalidae	Cardinals and Allies
Pheucticus melanocephalus	Black-headed grosbeak
Passerina amoena	Lazuli bunting
Icteridae	Blackbirds
Icterus parisorum	Scott's oriole
Fringillidae	Finches
Carpodacus purpureus	Purple finch
Carpodacus mexicanus	House finch
Carduelis psaltria	Lesser goldfinch
Mammalia	**Mammals**
Leporidae	Rabbits and hares
Sylvilagus audubonii	Desert cottontail
Lepus californicus	Black-tailed jackrabbit

Sciuridae	Squirrels
Ammospermophilus leucurus	White-tailed antelope squirrel
Xerospermophilus mohavensis	Mohave ground squirrel
Spermophilus beecheyi	California ground squirrel*
Geomyidae	Pocket gophers
Thomomys bottae	Botta's pocket gopher
Heteromyidae	Pocket mice and kangaroo rats
Dipodomys microps	Chisel-toothed kangaroo rat
Dipodomys panamintinus	Panamint kangaroo rat
Dipodomys merriami	Merriam's kangaroo rat
Chaetodipus formosus	Long-tailed pocket mouse
Perognathus longimembris	Little pocket mouse
Family Muridae	Mice, rats and voles
Peromyscus maniculatus	Deer mouse
Peromyscus crinitus	Canyon mouse
Peromyscus truei	Pinyon mouse
Onychomys torridus	Southern grasshopper mouse
Neotoma lepida	Desert woodrat
Neotoma macrotis	Big-eared woodrat
Canidae	Foxes, Wolves and relatives
Canis latrans	Coyote
Vulpes macrotis	Kit fox
Mustelidae	Weasels, Skunks and Relatives
Taxidea taxus	American badger
Felidae	Cats
Lynx rufus	Bobcat
Cervidae	Deer, elk and relatives
Odocoileus hemionus	Mule deer

*observed on BLM land near Dove Springs

Appendix B. Relative abundance of antelope ground squirrels (Individuals /500 trap-days*) at Onyx Ranch in 2012. * = Sites trapped for 400 trap-days due to weather.

Site #	Adult Females	Juvenile Females	Adult Males	Juvenile Males	# Individuals
153-070-05	5	2	19	1	27
153-130-01	21	0	13	0	34
153-130-03	19	0	18	0	37
153-130-05	27	0	20	0	47
153-140-05	14	2	17	1	34
153-140-07	20	1	23	4	48
153-150-02	10	0	17	0	27
153-150-04	14	0	17	0	31
153-150-06*	15	0	14	0	29*
153-160-02	14	1	14	2	31
153-160-04	17	8	21	5	51
153-170-03*	11	0	9	0	20*
153-240-12*	7	0	19	0	26*
153-240-14*	10	0	12	0	22*
153-240-16	22	0	16	0	38
181-020-02	24	0	24	0	48
181-020-13	18	0	16	0	34
181-080-32	24	0	22	0	46
Total	292	14	311	13	630

Appendix C. Mohave ground squirrel trapping localities (1st capture only for each individual).

Grid	Date	ID	UTM N	UTM E
3	4/24/2012	1	402459	3918759
3	4/25/2012	2	402459	3918619
4	4/23/2012	1	401974	3920281
4	4/25/2012	2	402114	3920281
4	4/26/2012	3	401834	3920176
4	4/26/2012	4	402044	3920176
5	3/28/2012	1	406212	3912311
7	4/9/2012	1	404271	3914565
7	4/9/2012	2	404236	3914705
7	4/11/2012	3	404166	3914810
8	4/10/2012	1	402146	3917176
9	4/23/2012	1	402858	3922028
9	4/23/2012	2	402928	3922063
9	4/23/2012	3	402928	3922028

9	4/23/2012	4	403033	3922028
9	4/24/2012	5	402963	3922063
9	4/25/2012	6	403033	3922063
9	4/25/2012	7	402928	3922168
9	4/25/2012	8	403103	3922168
10	5/9/2012	1	395740	3920390
14	4/23/2012	1	399679	3922984
14	4/23/2012	2	399713	3923018
15	4/9/2012	1	405721	3915655
15	4/12/2012	2	405962	3915654
17	5/21/2012	1	397882	3920884

Appendix D. Agassiz's desert tortoise sign observed at Onyx Ranch, 2012.

Date	Observer		UTM E	UTM N	Notes
3/19/2012	DL	11	408425	3911732	Scat on Grid 2
3/19/2012	DL	11	408374	3911722	Scat on Grid 2
3/20/2012	DL	11	406391	3910178	Scutes on Grid 1
3/26/2012	MA	11	407541	3914676	Carcass on Grid 0
3/26/2012	MA	11	407577	3914893	Scat on Grid 0
3/28/2012	DL	11	408506	3911654	Scat on Grid 2
3/28/2012	DL	11	408555	3911868	Scat on Grid 2
3/30/2012	CM	11	406957	3909711	Scutes near Grid 1
3/30/2012	CM	11	406654	3910071	Scutes on Grid 1
4/11/2012	MA	11	403473	3915731	Scat on Transect south of Grid 6
4/24/2012	DL	11	402735	3918623	Juvenile scat on Grid 3

Appendix E. Onyx Ranch Mohave Ground Squirrel Trapping Grid Photos, 2012.

APN 153-240-16 Facing East

APN 153-240-16 Facing West

APN 181-080-32 Facing East

APN 181-080-32 Facing West

APN 181-020-13Facing East

APN 181-020-13 Facing West

Appendix E. Onyx Ranch Mohave Ground Squirrel Trapping Grid Photos, 2012.

APN 153-150-04 Facing East

APN 153-150-04 Facing West

APN 153-130-05 Facing East

APN 153-130-05 Facing West

APN 181-020-02 Facing East

APN 181-020-02 Facing West

Appendix E. Onyx Ranch Mohave Ground Squirrel Trapping Grid Photos, 2012.

APN 153-170-03 Facing East

APN 153-170-03 Facing West

APN 153-240-12 Facing East

APN 153-240-12 Facing West

APN 153-150-06 Facing East

APN 153-150-06 Facing West

Appendix E. Onyx Ranch Mohave Ground Squirrel Trapping Grid Photos, 2012.

APN 153-130-03 Facing East

APN 153-130-03 Facing West

APN 153-140-07 Facing East

APN 153-140-07 Facing West

APN 153-070-05 Facing East

APN 153-070-05 Facing West

Appendix E. Onyx Ranch Mohave Ground Squirrel Trapping Grid Photos, 2012.

APN 153-160-02 Facing East

APN 153-160-02 Facing West

APN 153-160-04 Facing East

APN 153-160-04 Facing West

APN 153-130-01 Facing East

APN 153-130-01 Facing West

Appendix E. Onyx Ranch Mohave Ground Squirrel Trapping Grid Photos, 2012.

APN 153-240-14 Facing North

APN 153-240-14 Facing South

APN 153-150-02 Facing East

APN 153-150-02 Facing West

APN 153-140-05 Facing East

APN 153-140-05 Facing West

APPENDIX I

BIOLOGY TABLES
TRA Environmental Sciences, Inc.

Table I-1. Summary of Elevation, Soils, Vegetation Types, and Disturbances for the Acquisition Parcels

Parcel No.	Elevation Range (ft.)	Soils	Vegetation	Disturbances
Jawbone Canyon Parcels				
J-1	2,550-3,450	Jawbone and Typic Torriorthents-Rock Outcrop	lower Mojave woody scrub, creosote and bursage scrub, desert wash and terrace, blackbrush scrub, rock outcrops	Abundant OHV tracks, erosion
J-2	2,464-2,962	Cutterbank soils and Koehn sands	creosote and bursage scrub, desert wash and terrace, wetland and riparian	Abundant OHV tracks
J-3	2,360-3,240	Koehn sands and Jawbone associations	creosote and bursage scrub, desert wash and terrace, blackbrush scrubland, upper Mojave woody scrub	Abundant OHV tracks, erosion; invasive plants
J-4	2,130-2,440	Cutterbank soils and Koehn sands	creosote and bursage scrub, desert wash and terrace, wetland and riparian, barren, developed	Abundant OHV tracks, invasive plants
J-5	2,360-3,316	Jawbone association, Koehn sands and Cutterbank soils	creosote and bursage scrub, wetland and riparian, blackbrush scrubland, Joshua tree woodland, desert wash and terrace, barren	Abundant OHV tracks in lower portion
Sugarloaf Area Parcels				
S-1	3,120-3,340	Dove canyon loamy sand and Cutterbank soils	blackbrush scrubland, creosote and bursage scrub, desert wash and terrace	Some roads and OHV tracks
S-2	3,360-3,480	Dove canyon loamy sand and Cutterbank soils	blackbrush scrubland, desert wash and terrace	Moderate amount of OHV tracks
S-3	2,800-3,180	Cutterbank lakebed soils, Dove canyon loamy sand	creosote and bursage scrub, lower Mojave woody scrub, barren, upper Mojave woody scrub, desert wash and terrace, wetland and riparian	Small amount of OHV disturbance
S-4	2,760-3,320	Cutterbank lakebed soils, Dove canyon loamy sand	creosote and bursage scrub, desert wash and terrace, wetland and riparian	Little OHV disturbance, 1 designated road
S-5	3,000-4,132	Typic Torriorthents-Rock Outcrops, Jawbone Association, Cutterbank soils	lower Mojave woody scrub, creosote and bursage scrub, desert wash and terrace, rock outcrop, wetland and riparian	Moderate OHV disturbance
S-6	2,500-2,967	Cutterbank lakebed soils, Koehn coarse sands	creosote and bursage scrub, barren, desert wash and terrace, wetland and riparian	Moderate OHV disturbance

Table I-1. Summary of Elevation, Soils, Vegetation Types, and Disturbances for the Acquisition Parcels				
Parcel No.	**Elevation Range (ft.)**	**Soils**	**Vegetation**	**Disturbances**
Dove Springs Area Parcels				
D-1	4,320-4,960	Goldpeak-Wingap-Pinyonpeak complex	Joshua tree woodland, blackbrush scrubland, grassland	A few tracks from OHV or livestock
D-2	3,620-4,160	Pinyonpeak-Wingap-Rock Outcrop and Goldpeak complex	wetland and riparian, desert wash and terrace, lower Mojave woody scrub, Joshua tree woodland, blackbrush scrubland, upper Mojave woody scrub	Moderate OHV and livestock disturbance
D-3	4,040-4,606	Goldpeak-Wingap-Pinyonpeak complex	Joshua tree woodland, blackbrush scrubland	Low level of OHV disturbance
D-4	3,760-4,040	Goldpeak gravelly loamy sand	Joshua tree woodland	Moderate OHV disturbance
Alphie Canyon Area Parcels				
A-1	4,600-5,080	Goldpeak-Pinyonpeak-Wingate complex and Wingate-Pinyonpeak soils	Joshua tree woodland, blackbrush scrubland, desert wash and terrace	Low to moderate OHV and livestock disturbance
A-2	4,280-4,617	Wingate-Pinyonpeak and Goldpeak-Pinyonpeak-Wingate complex	Joshua tree woodland	Low to moderate OHV and livestock disturbance
A-3	3,780-4,200	Wingap-Pinyonpeak and Goldpeak soils	Joshua tree woodland, blackbrush scrubland, desert wash and terrace	Moderate OHV disturbance
A-4	3,320-3,856	Wingap, Pinyonpeak, Goldpeak and Jawbone-Typic Haplargids-Rock Outcrop soils	Joshua tree woodland, blackbrush scrubland, lower Mojave woody scrub, creosote and bursage scrub, barren, desert wash and terrace, wetland and riparian	Some OHV disturbance, invasive plants
A-5	3,040-3,920	Wingap-Pinyonpeak and Jawbone-Typic Haplargids	Joshua tree woodland, blackbrush scrubland, lower Mojave woody scrub, creosote and bursage scrub, barren, desert wash and terrace, wetland and riparian	Moderate OHV disturbance
A-6	3,200-3,680	Jawbone, Wingate-Pinyonpeak-Goldpeak, Typic Torriorthents, and Dovecanyon loamy sands	blackbrush scrubland, lower Mojave woody scrub, creosote and bursage scrub, desert wash and terrace	Moderate OHV disturbance, erodible soils

Table I-1. Summary of Elevation, Soils, Vegetation Types, and Disturbances for the Acquisition Parcels				
Parcel No.	**Elevation Range (ft.)**	**Soils**	**Vegetation**	**Disturbances**
A-7	2,960-3,584	Typic Torriorthents-Rock Outcrop soils and Dovecanyon loamy sand	blackbrush scrubland, lower Mojave woody scrub, desert wash and terrace	Moderate OHV disturbance
A-8	2,680-3,320	Jawbone-Typic Haplargids-Rock Outcrop association, Typic Torriorthents and Koehn fine sands	blackbrush scrubland, creosote and bursage scrub, desert wash and terrace, lower Mojave woody scrub, Joshua tree woodland, barren	Moderate OHV disturbance
Butterbredt Area Parcels				
B-1	5,000-5,560	Grandora-Pinyonpeak association	Joshua tree woodland, upper Mojave woody scrub	Designated roads only
B-2	4,720-5,360	Grandora-Pinyonpeak association and Goldpeak-Pinyonpeak-Wingap complex	Joshua tree woodland, upper Mojave woody scrub, blackbrush scrubland	Low level of vehicle disturbance
B-3	4,600-5,200	Grandora-Pinyonpeak association and Goldpeak-Pinyonpeak-Wingap complex	Joshua tree woodland	Low level of OHV disturbance
B-4	4,320-5,040	Goldpeak-Pinyonpeak-Wingap complex	Joshua tree woodland, blackbrush scrubland, juniper woodland	Butterbredt Well, non-native plants
B-5	4,500-5,200	Goldpeak-Pinyonpeak-Wingap complex	Joshua tree woodland, blackbrush scrubland	Light OHV and livestock disturbance
B-6	4,060-4,818	Goldpeak-Pinyonpeak-Wingap complex	Joshua tree woodland, blackbrush scrubland	Low level of OHV disturbance
B-7	4,420-5,409	Wingap-Pinyonpeak association	Upper Mojave woody scrub, Joshua tree woodland, blackbrush scrubland	Low level of OHV disturbance, erosion
B-8	4,140-4,500	Wingap-Pinyonpeak association	Blackbrush scrubland	Little disturbance
B-9	3,720-4,000	Wingap-Pinyonpeak association	Joshua tree woodland, blackbrush scrubland, desert wash and terrace, wetland and riparian	Abundant birdwatchers, invasive plants
B-10	3,640-4,760	Wingap-Pinyonpeak association	Joshua tree woodland, blackbrush scrubland, desert wash and terrace, wetland and riparian	Low to moderate OHV and livestock disturbance

Table I-1. Summary of Elevation, Soils, Vegetation Types, and Disturbances for the Acquisition Parcels

Parcel No.	Elevation Range (ft.)	Soils	Vegetation	Disturbances
Kelso Valley Area Parcels				
K-1	4,480-5,800	Xyno-Rock Outcrop-Canebrake association, Chollawell and Inyo soils	Upper Mojave woody scrub, desert wash and terrace, rock outcrop, wetland and riparian	Historic ranch roads, wildfire
K-2	4,390-5,640	Xyno-Rock Outcrop-Canebrake association, Chollawell and Inyo soils	Upper Mojave woody scrub, desert wash and terrace, rock outcrop, wetland and riparian, Joshua tree woodland	Historic ranch road, wildfire
K-3	4,680-4,840	Chollawell-Inyo complex	Joshua tree woodland, desert wash and terrace	Little disturbance
K-4	4,620-5,240	Grandora-Pinyonpeak association	Upper Mojave woody scrub, pine forest and woodland, desert wash and terrace	Low level vehicle and recreational disturbance
K-5	4,240-4,390	Inyo-Riverwash, Inyo, and Chollawell	Upper Mojave woody scrub, desert wash and terrace, Joshua tree woodland, grassland	Historic ranch roads, wildfire
K-6	4,220-4,643	Chollawell-Inyo complex and Inyo-Riverwash soils	Upper Mojave woody scrub, desert wash and terrace, Joshua tree woodland, blackbrush scrubland	Kelso Valley Rd. and historic ranch roads
K-7	4,270-6,274	Chollawell-Inyo complex and Wingap-Pinyonpeak soils	Upper Mojave woody scrub, Joshua tree woodland, blackbrush scrubland	Little disturbance
K-8	5,280-7.704	Sorrell-Martee-Rock Outcrop association	Pine forest and woodland, oak forest and woodland	Forest road, wildfire
K-9	4,175-4,680	Chollawell, cobbly and gravelly complex, Kernville-Faycreek Rock Outcrop, Inyo gravelly loam and Inyo-Riverwash	Upper Mojave woody scrub, desert wash and terrace, Joshua tree woodland, barren and rock outcrop, pine forest and woodland, wetland and riparian	Historic ranch roads, wildfire
K-10	4,180-4,700	Chollawell-Inyo complex	Joshua tree woodland, desert wash and terrace	Light vehicle disturbance
K-11	4,800-5,803	Wingap-Pinyonpeak association	Upper Mojave woody scrub, Joshua tree woodland, blackbrush scrubland	Little disturbance
K-12	4,600-6,760	Sorrell-Martee-Rock Outcrop association	Pine forest and woodland, oak forest and woodland, juniper woodland	Wildfire
K-13	4,020-4,175	Kelval fine sandy loam, Kernfork loam and Inyo gravelly loamy coarse sand	Desert wash and terrace, Joshua tree woodland, wetland and riparian, grassland, juniper woodland, developed	Moderate disturbance from livestock and wildfire

Table I-1. Summary of Elevation, Soils, Vegetation Types, and Disturbances for the Acquisition Parcels

Parcel No.	Elevation Range (ft.)	Soils	Vegetation	Disturbances
K-14	4,230-4,900	Chollawell gravelly loamy coarse sand	Joshua tree woodland, blackbrush scrubland	Light vehicle disturbance
K-15	4,880-6,480	Sorrell-Martee-Rock Outcrop group	Pine forest and woodland, oak forest and woodland, grassland	Little disturbance
K-16	4,200-5,280	Sorrell-Martee-Rock Outcrop and Kernville-Faycreek-Rock Outcrop groups	Pine forest and woodland, oak forest and woodland, juniper woodland, grassland, upper Mojave woody scrub, barren and rock outcrop	Wildfire, livestock
K-17	4,000-4,090	Kernfork loam, Chollawell and Inyo gravelly loamy coarse sand	Wetland and riparian, grassland, desert wash and terrace	Wildfire and hydrology disturbances
K-18	3,950-4,210	Chollawell and Inyo gravelly sandy soils	Joshua tree woodland, blackbrush scrubland, desert wash and terrace, juniper woodland, upper Mojave woody scrub	Moderate disturbance from roads and vehicles
K-19	4,000-4,200	Hoffman-Tips-Pilotwell association	Juniper woodland, Joshua tree woodland, blackbrush scrubland, desert wash and terrace, upper Mojave woody scrub	Jawbone Canyon Road
K-20	3,870-4,100	Kernfork loam and Chollawell gravelly loamy coarse sand	Wetland and riparian, grassland, desert wash and terrace, juniper woodland, oak forest and woodland	Hydrology and wildfire disturbances
Landers Meadow Parcels				
L-1	6,210-6,380	Wind River-Dome Rock group, Monache soils, and Scodie, Sacatar-Canebrake complex soils	Wetland and riparian, pine forest and woodland, upper Mojave woody scrub	Light vehicle disturbance
L-2	6,320-6,350	Deerspring fine sandy loams and Monache variant soils, Scodie-Sacatar-Canebrake complex	Wetland and riparian, pine forest and woodland, upper Mojave woody scrub	Little disturbance
L-3	6,400-6,840	Scodie-Sacatar-Canebrake association, and Sorrell-Martee-Rock Outcrop association	Pine forest and woodland	Light vehicle disturbance
Caliente Creek Parcels				
C-1	3,480-4,730	Tunis-Tollhouse-Sorrell Association	Juniper woodland, upper Mojave woody scrub, grassland, oak forest and woodland, pine forest and woodland	Light vehicle disturbance

Table I-1. Summary of Elevation, Soils, Vegetation Types, and Disturbances for the Acquisition Parcels

Parcel No.	Elevation Range (ft.)	Soils	Vegetation	Disturbances
C-2	4,000-4,620	Tunis-Tollhouse-Sorrell Association	Upper Mojave woody scrub, grassland, oak forest and woodland, pine forest and woodland	Light vehicle disturbance
C-3	Unknown	Unknown	Juniper woodland, grassland, oak forest and woodland, pine forest and woodland	Unknown
C-4	3,600-5,000	Locobill-Backcanyon-Sesame complex and Tunis-Tollhouse-Sorrell association	Juniper woodland, upper Mojave woody scrub, grassland, oak forest and woodland, pine forest and woodland	Light vehicle disturbance

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Insects					
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	Streamside habitats below 3,000 ft throughout the Central Valley.	Riparian and oak savanna habitats with elderberry shrubs; elderberry is the host plant.	None; no suitable habitat (i.e. elderberry shrubs) found in the project area.	1
Amphibians and Reptiles					
Kern Plateau slender salamander (*Batrachoseps robustus*)	USFS S	Occurs on the Kern Plateau of the southeastern Sierra Nevada in Kern County from 5,580 - 9,200 ft. (1,700 - 2,800 m), on the eastern slopes of the Sierra Nevada draining into the Owens Valley and Indian Wells Valley in Inyo County, at elevations of 4,690 to 8,000 ft. (1,430–2,440 m) and the Scodie Mountains in Kern County at elevations of 6,500 - 6,640 ft. (1,980 - 2,025 m).	Near springs and seeps in Jeffery pine/red fir and lodgepole pine forests and in riparian scrub.	Low. Only known from Kern Plateau and Scodie Mountains.	1, 2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Tehachapi slender salamander (*Batrachoseps stebbinsi)*	ST BLM S USFS S	Found in scattered populations in the Caliente Creek drainage at the juncture of the Sierra Nevada and the Tehachapi Mountains, and in isolated canyons on the northern slopes of the Tehachapi Mountains from Tejon Canyon to Fort Tejon.	Moist canyons and ravines in oak and mixed woodlands.	Moderate. Potential habitat present in southwestern corner of project area in Caliente Creek watershed.	1, 2
yellow-blotched salamander (*Ensatina eschscholtzii croceator*)	CSSC BLM S USFS S	This California endemic subspecies occurs in the lower Kern River Canyon, the Paiute Mountains, Breckenridge Mountain, the Tehachapi mountains, on Mt. Pinos, near Fort Tejon, and near Frazier-Alamo mountain.	Oak woodland, pine and fir woodlands.	Moderate. Suitable habitat present in southwest corner of project area in Piute Mountains.	1, 2
Western pond turtle (*Actinemys marmorata*)	CSSC BLM S USFS S	From Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley and on western slope of Sierra Nevada.	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests.	Moderate. Suitable aquatic habitat present at ponds in Kelso Valley. Not known from the project area.	1, 2
desert tortoise (*Gopherus agassizii*)	FT ST	In California, it is found throughout the Mojave Desert south along the Colorado river and along the east side of the Salton Basin. Absent from the Coachella Valley.	Variety of desert scrub habitats with friable soils.	Present. This species was observed in the eastern portion of the project area during the Spring 2012 desert tortoise surveys.	1, 2, 3, 4

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Coast horned lizard (*Phrynosoma blainvillii*)	CSSC BLM S USFS S	Historically, found along the Pacific coast from the Baja California border west of the deserts and the Sierra Nevada, north to the Bay Area, and inland as far north as Shasta Reservoir, and south into Baja California. Ranges up onto the Kern Plateau east of the crest of the Sierra Nevada. Current range is more fragmented.	Chaparral, grasslands, coniferous forests in fine, loose soils.	High. Suitable habitats present throughout much of project site. Present throughout adjacent NRSP.	1, 2, 6
silvery legless lizard (*Anniella pulchra pulchra*)	CSSC USFS S	Occurs from the southern edge of the San Joaquin River in northern Contra Costa County south to northwestern Baja California Del Norte just south of Colonia Guerrero. Five lineages; Lineage D occurs in project area.	Dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and riparian habitats with moist, sandy soils.	High. Suitable habitats in moist, sandy soils. Observed in 2010 during surveys for NSRP.	2, 6
rosy boa (*Charina trivirgata*)	USFS S	Occurs in the extreme south of California, in Arizona and in Northern Mexico.	Inhabits arid scrublands, semi-arid shrublands, rocky shrublands, rocky deserts, canyons, and other rocky areas. Appears to be common in riparian areas, but does not require permanent water.	None. The project area is outside of this species' range.	1

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Birds					
American white pelican (nesting colony) (*Pelecanus erythrorhynchos*)	CSSC	Within California, a year-round resident along the Coast and Central Valley from the San Francisco Bay Area south to the border with Mexico; and a summer resident in the northeast corner of California.	White pelicans nest on the ground in colonies on earthen, sandy or rocky, islands, peninsulas or tule mats. They forage in shallow inland waters or shallow coastal marine waters.	Present. Observed in the project area incidentally during Spring 2012 avian surveys. White pelicans do not breed in the project area, but are known to migrate through.	5
Northern harrier (*Circus cyaneus*)	CSSC	Throughout lowland California; has been recorded in fall at high elevations.	Grasslands, meadows, marshes, and seasonal and agricultural wetlands.	Present. Observed in the project area incidentally during Spring 2012 avian surveys. Potential nesting habitat present in Kelso Valley. Known to migrate through area.	2, 3, 4, 5
white-tailed kite (*Elanus leucurus*)	CFP	Lowland areas west of Sierra Nevada from head of Sacramento Valley south, including coastal valleys and foothills, to western San Diego County at Mexico border.	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	Low. No nesting habitat present, project area is at the edge of this species' range. May occasionally pass through area.	2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Cooper's hawk (*Accipiter cooperii*)	WL	Year-round resident throughout California except the Southeastern corner of the State, where it is a winter resident.	Breeds in extensive forests and smaller woodlots of deciduous, coniferous, and mixed pine-hardwoods, as well as in pine plantations, in both suburban and urban habitats. It captures a variety of prey, mainly medium-sized birds and mammals such as doves, jays, robins, chipmunks, and other rodents.	Present. This species was observed in the project area incidentally during the Spring 2012 avian surveys.	5
Northern goshawk (*Accipiter gentilis*)	CSSC BLM S USFS S	Year round resident in northern Coast Ranges, the Klamath and Siskiyou Mountains, Modoc Plataeu, Warner Mountains and south through the Sierra Nevada. Also occurs in the Tehachapi Mountains, Glass Mountain region, White-Inyo ranges, Mount Pinor-Frazier Mountain area and the San Gabriel, San Bernardino, San Jacinto, and Cuyamaca mountains.	Nests in mature conifer forests; winters in variety of habitats.	Moderate. Rare breeder in southern Sierra Nevada; nearest nesting records from Greenhorn Mountains. Known to migrate through Kelso Valley.	2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Swainson's hawk (*Buteo swainsoni*)	ST USFS S	Lower Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley; highest nesting densities near Davis and Woodland, Yolo County.	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields.	Present. Observed in the project area incidentally during Spring 2012 avian and Mojave ground squirrel surveys. Outside breeding range. Known to pass through area during migration.	2, 3, 5
ferruginous hawk (*Buteo regalis*)	USFS S WL	Does not nest in California; winter visitor along coast from Sonoma to San Diego Counties, east to Sierra Nevada foothills and southeastern deserts, Inyo-White Mountains, plains east of Cascade Range, and Siskiyou County.	Open terrain in plains and foothills where ground squirrels and other prey are available.	Present. Suitable wintering habitat present. Known from Kelso Valley and Butterbredt Canyon.	2
golden eagle (*Aquila chrysaetos*)	CFP	Foothills and mountains throughout California.	Nests on cliffs and escarpments or in tall trees overlooking open country; forages in annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals.	Present. Observed in the project area incidentally during Spring 2012 avian and Mojave ground squirrel surveys.	1, 2, 3, 4, 5, 6

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Osprey (*Pandion haliaetus*)	WL USFS S	Within California, the breeding range is in Northern California and the winter range is mainly along the coast, extending inland in two small areas in the northern part of its winter range and across the Sierras into the Mojave Desert.	Nests near open water atop trees, rocky cliffs and promontories as well as artificial sites such as channel markers and utility towers. Feeds almost exclusively on fish.	Present. Observed in the project area incidentally during Spring 2012 avian surveys and Mojave ground squirrel surveys. Known to migrate through the project area.	3, 5
prairie falcon (*Falco mexicanus*)	WL	Permanent resident in south Coast, Transverse, Peninsular, and northern Cascade Ranges; southeastern deserts, Inyo-White Mountains, foothills surrounding the Central Valley; and in the Sierra Nevada in Modoc, Lassen, and Plumas Counties; winters in Central Valley, along the coast from Santa Barbara to San Diego Counties, and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties.	Nests on cliffs or escarpments, usually overlooking dry, open terrain or uplands.	Present. Observed in the project area incidentally during Spring 2012 avian and Mojave ground squirrel surveys. Suitable nesting habitat present on cliffs; Observed in 2010 during surveys for NSRP. Nest identified near Sugarloaf in 2011.	1, 2, 3, 5, 6
American peregrine falcon (*Falco peregrines anatum*)	CFP	Year-round resident throughout California.	Nests on cliffs or man-made structures such as buildings and bridges; feeds on birds.	Present. Has been observed at Butterbredt Spring. Outside known breeding range.	2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Western snowy plover (*Charadrius alexandrinuss*) (interior population)	FT CSSC	In California, inland populations occur in the southern San Joaquin Valley, the Klamath Basin, Modoc Plateau, the Great Basin desert and in the Mojave and Colorado deserts.	In interior California, snowy plovers breed on barren to sparsely vegetated flats and along shores of alkaline and saline lakes, reservoirs, ponds, braided river channels, agricultural wastewater ponds, and salt evaporation ponds.	Low. No suitable habitat in project area. The closest known occurrence is at Koehn Lake, approximately 5 miles to the east.	1
mountain plover (*Charadrius montanus*) (wintering)	CSSC BLM S	In California, winters in the Central and Imperial Valleys, Central San Diego County, southeastern and western Los Angeles County and in isolated pockets along the coast.	Winters in open habitats, agricultural fields.	Moderate. Suitable wintering habitat present in eastern portion of project area.	1, 2
long-billed curlew (*Numenius americanus*)	WL	Occurs as a winter (non-breeding) migrant along the California coast, and in the Central and Imperial Valleys. Summer (breeding) migrant in northeastern California and in the Owens Valley.	Nests in meadows; winters in open habitats, wetlands, grasslands and agricultural fields.	Low. Outside breeding range; known to winter in Antelope Valley. There are no records of this species from the project area.	2
long-eared owl (*Asio otus*)	CSSC	In California, occurs throughout the state except in the Central Valley, in pockets along the coast and in the far central south.	Nests in riparian habitats and other dense stands of trees.	Present. Known to breed at Butterbredt Springs. Suitable nesting habitat at Butterbredt Spring. Foraging habitat present throughout project site.	1, 2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
burrowing owl (*Athene cunicularia*)	CSSC BLM S	Lowlands throughout California, including Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast.	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows.	Present. A pair and at least one juvenile were observed incidentally near Jawbone Canyon Road during Spring 2012 avian surveys.	1, 2, 4, 5
Vaux's swift (*Chaetura vauxi*) (nesting)	CSSC	A summer (breeding) migrant in northern California and coastal California from the Oregon border to Monterey County, and in the Sierra Nevada from the Oregon border to northern Kern County.	Nests in snags and hollow trees in redwood and Douglas fir forests.	Present. Observed in the project area during Spring 2012 avian and Mojave ground squirrel surveys. No nesting habitat present. Common migrant through project area.	2, 3, 5, 6
black swift (*Cypseloides niger*)	CSSC	This species occurs in California as a summer resident and its breeding range is patchily distributed throughout the State excluding the Central Valley and much of the coast.	Nests behind or beside permanent or semi-permanent waterfalls, on perpendicular cliffs near water and in sea caves.	Present. This species was observed incidentally in the project area during the Spring 2012 Mojave ground squirrel surveys. There is no nesting habitat in the project area.	3
olive-sided flycatcher (*Contopus cooperi*)	CSSC	A summer (breeding) migrant in the Cascade Range and Modoc Plataeu in northern California, Sierra Nevada in eastern California, Coast Ranges, and Transverse and Peninsular Ranges in Southern California.	Nests in coniferous forests.	Present. Observed at the cottonwood spring at the intersection of Jawbone Canyon and Kelso Valley Roads in May 2012. No nesting habitat present. Common migrant through project area.	2, 5, 6

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
willow flycatcher (*Empidonax traillii*)	SE USFS S	Occurs as a summer (breeding) migrant in moist thickets and riparian areas throughout California.	Nests in dense riparian habitats with perennial water.	Present. No nesting habitat present. Common migrant through project area. Has been observed at Butterbredt Springs. Observed in 2010 during surveys for NSRP.	2, 6
loggerhead shrike (*Lanius ludocivianus*)	CSSC	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter.	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Present. Frequently observed in project area during the Spring 2012 avian surveys. Resident species known to breed in the project area.	2, 3, 4, 5
least bell's vireo (*Vireo belli pusillis*)	FE SE	Occurs as a summer (breeding) migrant in the far south of California and in northern Baja California.	Nests in riparian habitats, generally in dense vegetation near surface water.	Present. No nesting habitat present. Casual migrant through area. Has been observed at Butterbredt Spring and Jawbone Canyon.	2
California horned lark (*Eremophila alpestris actia*)	WL	Much of the state; less common in mountainous areas of the north coast and in coniferous or chaparral habitats.	Common to abundant resident in variety of open habitats, usually where large trees and shrubs are absent; grasslands and deserts to dwarf shrub habitats above tree line.	Present. Observed in the project area during Spring 2012 avian surveys.	1, 4, 5

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
purple martin (*Progne subis*)	CSSC	Summer (breeding) migrant in northern and coastal California, in the Sierra Nevada, in isolated pockets of the Central Valley, in the Tehachapi Mountains and in mountainous regions of San Diego County.	Nests in snags in montane forests.	Present. This species has been recorded at Butterbredt Springs. Suitable habitat occurs in the western portion of the site.	2
Bendire's thrasher (*Toxostoma bendirei*)	CSSC BLM S	In California, it is patchily distributed in the Eastern and Southern Mojave and in the Colorado Desert.	Nests in open desert washes and scrub habitats.	Present. Suitable habitat in many parts of site. Known from Kelso Valley and Butterbredt Canyon.	2
yellow warbler (*Dendroica petechia*)	CSSC	Nests over all California except Central Valley, Mojave Desert region, and high altitudes in Sierra Nevada; winters along Colorado River and in parts of Imperial and Riverside Counties.	Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral; may also use oaks, conifers, and urban areas near stream courses.	Present. Observed at Butterbredt Springs incidentally in May 2012. Common migrant through project area.	2, 4, 5
yellow-breasted chat (*Icteria virens*) (nesting)	CSSC	Summer (breeding) migrant in northern California, in portions of the Central Valley and the west slope of the Sierra Nevada, on the Central and Southern coast, and in portions of the southern California deserts.	Nests in dense riparian and shrub habitats.	Present. Observed at Butterbredt Springs incidentally in May 2012. Common migrant through project area.	2, 5
grasshopper sparrow (*Ammodramus savannarum*)	CSSC	Summer (breeding) migrant along the California coast.	Nests in grasslands.	Low. Outside known breeding area and there are no records of this species in the area.	2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area					
Common Name (Scientific Name)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Potential Occurrence in the Project Area[b]**	**Sources**
tricolored blackbird (*Agelaius tricolor*)	CSSC BLM S	Permanent resident in Central Valley from Butte to Kern Counties; breeds at scattered coastal locations from Marin to San Diego Counties and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties.	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	Low. Marginal habitat at ponds in Kelso Valley. Nearest known nesting record from near Koehn Lake.	1, 2
Mammals					
Western mastiff bat (*Eumops perotis californicus*)	CSSC BLM S	Uncommon resident in southeastern San Joaquin Valley and Coastal Ranges from Monterey County southward through southern California, from the coast eastward to the Colorado Desert.	Roosts in high rock crevices, occasionally buildings.	High. Roosting habitat present in rock crevices. Detected during surveys for NSRP.	2, 6
pocketed free-tailed bat (*Nyctinomops femorosaccus*)	CSSC	Found in Riverside, San Diego, and Imperial Counties; rare in California.	Roosts in caves and rocky crevices in semi-arid habitats.	Moderate. Suitable habitat present throughout much of project area.	2
big free-tailed bat (*Nyctinomops macrotis*)	CSSC	Rare in California; found only in urban areas of San Diego and as a vagrant elsewhere.	Roosts in rock crevices. Associated with pinyon-juniper habitat.	Moderate. Suitable habitat present throughout much of project area.	2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
pallid bat (*Antrozous pallidus*)	CSSC BLM S USFS S	Throughout California except high Sierra from Shasta to Kern Counties and northwest coast, primarily at lower and mid-elevations.	Occurs in a variety of typically arid habitats including all types of woodland especially oak savanna and grassland. May also be found in riparian areas and wetlands, orchards, vineyards, and cropland if appropriate roosting sites are available.	High. Roosting habitat present in mines and trees. Detected during surveys for NSRP. Known from Red Rock Canyon.	1, 2, 6
Townsend's big-eared bat (*Corynorhinus townsendii*)	CSSC; BLM S USFS S	Found throughout California, but details of its distribution are not well known.	Roosts in caves, buildings, hollow trees; forages in many habitats. Most abundant in mesic habitats.	High. Roosting habitat present in mines and trees. Detected during surveys for NSRP. Known from Piute Mountains.	1, 2, 6
spotted bat (*Euderma maculatum*)	CSSC BLM S	Found in foothills, mountains and desert regions of southern California.	Roosts in large cliffs, forages in a variety of habitats.	High. Suitable roosting habitat in cliffs. Known from Red Rock Canyon.	1, 2
Western red bat (*Lasiurus blossevillii*)	CSSC USFS S	Scattered throughout much of California at lower elevations.	Found primarily in riparian and wooded habitats. Occurs at least seasonally in urban areas. Day roosts in trees within the foliage.	High. Suitable roosting habitat at Butterbredt Spring. Detected during surveys for NSRP.	2, 6
small-footed myotis (*Myotis ciliolabrum*)	BLM S	Occurs in coastal California from Contra Costa County south to the Mexican border, on the west and east sides of the Sierra Nevada, in Great Basin, and in desert habitats from Modoc to Kern and San Bernardino Counties.	Roosts in mines, crevices and trees; forages in scrub and woodland.	High. Roosting habitat present in mines and rock crevices. Detected during surveys for NSRP.	2, 6

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
long-eared myotis (*Myotis evotis*)	BLM S	Occurs along the entire coast and in the Sierra Nevada, Cascades, and Great Basin from the Oregon border south through the Tehachapi Mountains to the Coast Ranges; uncommon in most of its range.	Roosts in rock crevices, trees and mines; forage in forest and woodland.	High. Roosting habitat present in mines and rock crevices. Detected during surveys for NSRP.	2, 6
fringed myotis (*Myotis thysanodes*)	BLM S	Widespread in California; occurs in all areas but the Central Valley and Colorado and Mojave deserts.	Roosts in rock crevices, trees and mines; forage in scrub and woodlands.	High. Roosting habitat present in mines and rock crevices. Detected during surveys for NSRP.	2, 6
Yuma myotis (*Myotis yumanensis*)	BLM S	Common and widespread in California; uncommon in the Mojave and Colorado Desert regions, except for the mountain ranges bordering the Colorado River Valley.	Roosts in buildings, trees & crevices, forage in variety of habitats.	High. Roosting habitat present in rock crevices and trees. Detected during surveys for NSRP.	2, 6
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	CSSC BLM S	Occurs along the western margin of the Tulare Basin, including western Kern County; in Carrizo Plain Natural Area; along the Cuyama Valley side of the Caliente Mountains, San Luis Obispo County; and in the Ciervo-Panoche Region, in Fresno and San Benito counties.	Desert scrub habitats.	High. Suitable habitat throughout project site. Known from Red Rock Canyon SP and Kelso Valley.	1, 2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Tehachapi pocket mouse (*Perognathus alticola inexpectatus*)	CSSC BLM S USFS S	Occurs from the vicinity of Tehachapi Pass, west to Mount Pinos, and south to Elizabeth and Quail Lakes, at elevations from 1030 to 1830 meters.	Grassland, pinyon-juniper, Joshua tree woodland, oak savannah	Moderate. Suitable habitat in Joshua tree woodland, pinyon-juniper and oak savannah. Nearest known record from near Tehachapi, ~15 miles SSW.	2
San Joaquin pocket mouse (*Perognathus inornatus inornatus*)	BLM S	In the Central and Salinas Valleys between 1,100 and 2,000 ft. (350 and 600 m.).	Grasslands and open scrub habitats with friable soils.	High. Suitable habitat in southwestern part of project site. Known from near Twin Oaks, about 7 miles southwest of the southwestern corner of the project area.	1, 2
yellow-eared pocket mouse (*Perognathus parvus xanthonotus*)	BLM S	Inhabits the eastern slopes of the Piute Mountains and Sierra Nevada along the western fringe of the Mojave Desert.	Joshua tree woodland, desert scrub, pinyon-juniper, sagebrush and bunchgrass habitats.	High. Suitable habitat in northwestern portion of project site. Known from head of Kelso Valley.	1, 2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
Mohave ground squirrel (*Xerospermophilus mohavensis*)	ST	Occurs in portions of Inyo, Kern, Los Angeles and San Bernardino counties in the western Mojave Desert.	Creosote scrub, saltbush scrub in western Mojave Desert.	Present. Species detected in multiple locations in the project area in Spring 2012 small mammal trapping surveys. Suitable habitat throughout much of project area with the exception of very steep, rocky terrain. Tolerant of some level of OHV use. Known from Jawbone Canyon, Dove Spring Canyon, Butterbredt Canyon and Red Rock Canyon SP.	2
Ringtail (*Bassariscus astutus*)	CFP	Occurs throughout California in low to middle elevations, except in the far northeast and in the Central Valley from San Joaquin to Kern Counties.	Primarily near riparian habitats, but also in forest and shrub habitats.	Moderate. No known records from area. Potential habitat in Piute Mountains and in proximity to water-sources including Dove Spring Canyon, Butterbredt Canyon and Alphie Spring.	2
Pacific fisher (*Martes pennanti (pacifica*) DPS)	CSSC BLM S USFS S	In California, occurs only in the far north and southern Sierra Nevada.	Closed-canopy coniferous forests.	Moderate. Suitable habitat in western edge of project site. Near southern edge of range. Known from Piute Mountains.	1, 2

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
American badger (*Taxidea taxus*)	CSSC	Occurs throughout California and the western United States and Canada.	Variety of open habitats with friable soils.	Present. Documented in the project area during Spring 2012 surveys for Mohave ground squirrel.	1, 2, 3, 4
desert kit fox (*Vulpes macrotis*)	Protected fur-bearing mammal	In California, occurs in the southern Central Valley and in southeast California.	Inhabits arid and semi-arid regions encompassing desert scrub, chaparral, halophytic, and grassland communities; at elevations ranging from 1,312 to 6,234 ft. (400 to 1,900 m). Loose textured soils may be preferred for denning.	Present. Documented in the project area during Spring 2012 surveys for Mohave ground squirrel.	1, 2, 3

[a] Status explanations:

Federal:

FE = Listed as endangered under the Federal Endangered Species Act.

FT = Listed as threatened under the Federal Endangered Species Act.

BCC = Fish and Wildlife Service Birds of Conservation Concern (Regions 32 or 33)

BLM S = Listed as Sensitive Species by Bureau of Land Management

USFS S = Listed as Sensitive Species by US Forest Service

State:

SE= Listed as endangered under the California Endangered Species Act.

ST= Listed as threatened under the California Endangered Species Act.

CSSC = Species of Special Concern designated by California Department of Fish and Game

CFP = Fully Protected Species under California Fish and Game Code.

WL = On the California Department of Fish and Game Watch List.

Other Acronyms:

NSRP = North Sky River Project

HSWEP = Hoffman Summit Wind Energy Project

[b] Potential Occurrence explanations:

Present: Species was observed on the project site, or recent species records (within five years) from literature are known within the project area.

High: The CNDDB or other reputable documents record the occurrence of the species off-site, but within a 10-mile radius of the project area and within the last 10 years. High-quality suitable habitat is present within the project area.

Moderate: Species does not meet all terms of High or Low category. For example: CNDDB or other reputable documents may record the occurrence of the species near but beyond a 10-mile radius of the project area, or some of the components representing suitable habitat are present within or adjacent to the project area, but the habitat is substantially degraded or fragmented.

Low: The CNDDB or other documents may or may not record the occurrence of the species within a 10-mile radius of the project area. However, few components of suitable habitat are present within or adjacent to the project area.

Table I-2. Special-status Wildlife Potentially Occurring in the Project Area

Common Name (Scientific Name)	Listing Status[a]	Geographic Distribution in California	Habitat Requirements	Potential Occurrence in the Project Area[b]	Sources
			None: CNDDB or other documents do not record the occurrence of the species within or reasonably near the project area and within the last 10 years, and no or extremely few components of suitable habitat are present within or adjacent to the project area.		

Sources:

1. *California Natural Diversity Database (CNDDB). 2012. California Department of Fish and Game, Biogeographic Data Branch. Last updated August, 2012.*
2. *Biosearch Associates. 2011. Preliminary Habitat Assessment for Special-Status Vertebrates, Onyx Ranch Acquisition Project Site, Kern County, California. Letter report prepared for TRA Environmental Sciences, Inc. December 16.*
3. *Biosearch Associates. 2012. Special-status Species Surveys for Renewable Resources Property Acquisition Project, Kern County, CA. Report prepared for TRA Environmental Sciences, Inc. August 9.*
4. *Leatherman Bioconsulting, Inc. 2012. Desert Tortoise Survey of Renewable Resources Property Acquisition Project, Kern County, CA. Report prepared for TRA Environmental Sciences, Inc. August.*
5. *TRA Environmental Sciences, Inc. 2012. Renewable Resources Property Acquisition Project Avian Study Report. September.*
6. *Biological studies performed for adjacent wind energy development projects: North Sky River Project and Hoffman Summit Wind Energy Project.*

APPENDIX J

A CULTURAL RESOURCE SURVEY FOR THE ONYX RANCH ACQUISITION KERN COUNTY, CA
California Department of Parks and Recreation, OHMVR Division

A Cultural Resource Survey for the Onyx Ranch Acquisition Kern County, California

(*photo courtesy of California State Parks 2011)*

Prepared for

State of California,
Department of Parks and Recreation,
Off-Highway Motor Vehicle Recreation Division

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August 2012

All confidential cultural information has been removed in accordance with Government Code 6254.10

EXECUTIVE SUMMARY

The State of California, Department of Parks and Recreation (DPR) Off-Highway Motor Vehicle Recreation (OHMVR) Division has conducted a cultural resource survey for the proposed acquisition of land located in Kern County within the Mojave Desert. The acquisition area consists of land privately owned by Renewable Resources Group. The acquisition area is located adjacent to land owned by the Bureau of Land Management (BLM), California State Parks (Red Rock State Park), and additional private land owners. The project area is located north of the towns of Mojave and Tehachapi. The cultural resource survey occurred in compliance with the California Environmental Quality Act (CEQA).

Pre-field research consisted of a record search at the Southern San Joaquin Valley Information Center (CSU, Bakersfield) of the California Historical Resources Information System on January 20, 2011 by Associate State Archaeologists Kelly Long and Alicia Perez. An additional record search was conducted at the Bureau of Land Management's (BLM) Ridgecrest Field Office on October 3, 2011 by Kelly and Alicia. The OHMVR Division archives and the California State Library were also consulted as part of the pre-field research. A record search of the Native American Heritage Commission (NAHC) sacred files was also conducted. Consultation with Native American tribes and individuals listed on the contact list provided by NAHC was also completed.

The field work was completed by archaeologists with the OHMVR Division and the Archaeology, History & Museums Division. Supplemental field work was also conducted by the consulting firm Far Western Anthropological Research Group, Inc. This report includes an overview of the regulatory context for the cultural resource inventory as well as prehistoric, ethnographic and historic overviews of the project area. Additionally, this report summarizes the results of all fieldwork which took place in March, April and October of 2011, and June of 2012. As a result of the field work, 6 previously recorded sites and 23 new sites were identified within the project area for a total of 29 sites, 13 of which are prehistoric, 1 multi-component, and 15 historic-era sites. 63 isolated finds were also recorded and include 20 prehistoric, 42 historic, and one multi-component. In addition to fieldwork results, this report also provides cultural resource management recommendations for resources located within the project area. The results from this report will be incorporated into the final Environmental Impact Report (EIR) for this acquisition. Appendix A includes correspondence between DPR and the Native American Heritage Commission as well as with members of the Native American community. Appendix B includes the DPR 523 archaeological site records. Appendix C includes the *Addendum Report on an Archaeological Survey for the Proposed Onyx Ranch, Land Acquisition, Kern County, California* report by Far Western (2012).

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INTRODUCTION

A cultural resource survey was conducted of areas within the proposed Onyx Ranch acquisition boundary. The archaeological field work included the relocation of all previously recorded sites, and the recordation of newly identified resources. DPR Associate State Archaeologists, Alicia Perez and Kelly Long, and Assistant State Archaeologist Margaret Kress and Archaeological Project Lead Joanna Collier with the OHMVR Division, along with Associate State Archaeologist Chris Corey and Assistant State Archaeologist Patrick Riordan from the Archaeology, History, & Museums Division, completed the field work. The archaeological field work occurred in March, April and October of 2011. Supplemental field work was also conducted by Far Western Anthropological Research Group, Inc. in June of 2012 (Appendix C).

Pre-field research consisted of a record search at the Southern San Joaquin Valley Information Center (CSU, Bakersfield) of the California Historical Resources Information System on January 20, 2011 by Associate State Archaeologists Kelly Long and Alicia Perez. An additional record search was conducted at the Bureau of Land Management (BLM) Ridgecrest Field Office on October 3, 2011 by Kelly and Alicia. OHMVR Division archaeologists met with BLM archaeologists to discuss the project and exchange information. Additional research was conducted at the OHMVR Division archives, and the California State Library. A record search of the Native American Heritage Commission (NAHC) sacred files was also conducted. Consultation with Native American tribes and individuals listed on the contact list provided by NAHC was also completed. This correspondence is located in Appendix A. As a result of the field work, six previously recorded sites and 23 new sites within the project area for a total of 29 sites, 13 of which are prehistoric, one multi-component, and 15 historic-era sites. 63 isolated finds were also recorded; 20 prehistoric, 42 historic-era, and one multi-component. Results of the inventory are noted in Table 3, and Figure 4 through Figure 11. The archaeological DPR 523 site records are located in Appendix B of this report.

In compliance with CEQA, the purpose of this cultural resource study is to provide baseline data regarding the existence and current conditions of cultural resources located within the proposed acquisition boundary. Results from this study will be included in the environmental impact report (EIR) to be completed on behalf of the proposed acquisition. The purpose of an EIR is to provide public agencies and the public detailed information about the effect(s) which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project (Public Resources Code [PRC] § 21061). The results from this cultural resource inventory will provide the following:

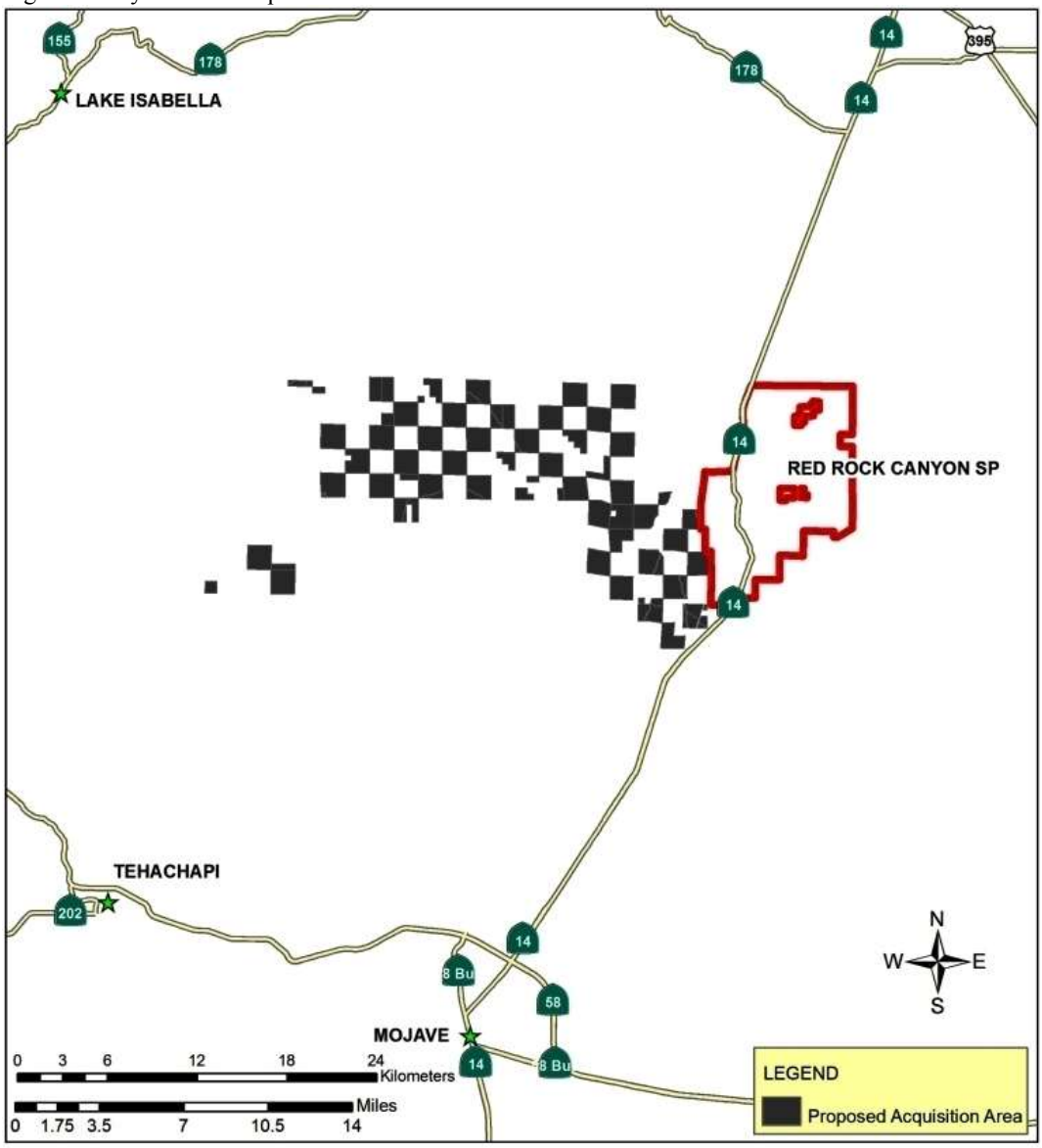
- a cultural resource setting, including prehistoric, ethnographic and historic overviews, and previous cultural resource studies of the project area,
- a current inventory of known cultural resources within the project area,
- preliminary resource evaluations according to the National Register of Historic Places and the California Register of Historical Resources significance and integrity criteria
- an assessment of the potential for significant impacts to historical resources, and
- options for avoiding or minimizing impacts to historical resources in compliance with CEQA and Public Resources Code (PRC) §5024 and PRC §5024.5

PROJECT AREA AND DESCRIPTION

Project Location

The State of California, Department of Parks and Recreation (DPR), Off-Highway Motor Vehicle Recreation (OHMVR) Division has conducted a cultural resource survey for the proposed acquisition of land located in Kern County within the Mojave Desert. The acquisition area consists of land privately owned by Renewable Resources Group and is located adjacent to land owned by the Bureau of Land Management (BLM), California State Parks (Red Rock State Park), and additional private land owners. The project area is located north of the towns of Mojave and Tehachapi (Figure 1).

Figure 1. Onyx Ranch Acquisition General Area



REGULATORY CONTEXT

The California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) establishes statutory requirements for the formal review and analysis of projects. The *CEQA Guidelines* have been adopted by the State to guide public agencies in implementing CEQA. CEQA (PRC Sections 21000, et seq.) requires that before approving most state discretionary projects the Lead Agency must identify and examine the significant adverse environmental effects which may result from that project. An initial study must be prepared for projects which are not exempt from CEQA, and will be used to determine whether or not a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report is necessary for the project (14 CCR 15063). The effectiveness of the initial study depends largely upon an accurate evaluation of the project's potential to significantly directly or indirectly effect known archaeological resources.

An effective determination of whether or not a project will adversely affect archaeological resources is contingent upon supporting baseline data that includes, but is not limited to, archaeological archival research, field work, analyses, and resource evaluations. A record search to determine whether any previously identified resources that exist within the project boundary is the first step in determining whether there may be archaeological resources present. A record search is conducted at the applicable California Historical Resources Information System (CHRIS). There are 11 regional centers that maintain the State Archaeological Inventory as part of the Historical Resources File System. This system maintains current information on recorded archaeological sites, as well as resources listed in the California Register of Historical Resources. Additional sources of information include colleges and universities within archaeology departments, the local historical or archaeological society, local Native American groups, or appropriate archives and repositories. Most importantly, the Native American Heritage Commission maintains a file of sacred lands which contain information unavailable elsewhere. If the project area has never been surveyed for archaeological resources, the lead agency should require a field survey by a qualified state professional archaeologist to identify, record, and evaluate known archaeological resources within the project boundary.

CEQA recognizes archaeological resources as part of the environment. For the purpose of CEQA, "environment" is defined to include "the physical conditions which exist within the area which will be affected by the proposed project, including...objects of historic or aesthetic significance" (PRC § 21060.5). A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment (§ 21084.1). Additionally, if the lead agency determines that a project may have a significant effect on unique archaeological resources, these effects will be addressed in an environmental impact report, or proper mitigations can be made to lessen or avoid impacts all together (PRC § 21083.2). PRC § 21084.1 and 21083.2 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. The former applies to archaeological sites which are listed on or eligible for listing on the California Register of Historical Resources, the latter applies to other "unique" archaeological resources. Either of these benchmarks may indicate that a proposed project may have a potential adverse effect on archaeological resources.

Historical Resources

A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment (PRC § 21084.1). Pursuant to subsection (a) of 14 CCR 15064.5 the term "historical resources" includes the following:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (PRC §5024.1, Title CCR, Section 4850 et seq.).
(2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources code or identified as significant in an historical resource survey meeting the

requirements of section 5024.1(g) of the Public Resources Code, shall be presumed historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR, Section 4852) including the following:

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
(B) Is associated with the lives of persons important in our past;
(C) Embodies the distinctive characteristics of type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
(D) Has yielded, or may be likely to yield, information important in prehistory or history.

(4) the fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined by Public Resources Code sections 5020.1(j) or 5024.1.

Aside from meeting the above listed criteria, in order for an archaeological resource to be a historical resource it must also be at least 50 years old and embody several aspects of integrity (location, design, setting, material, workmanship, feeling, and association).

Unique Archaeological Resources

PRC § 21083.2 explicitly requires that the initial study examine whether the project may have a significant adverse effect on "unique archaeological resources." Pursuant to part (g) of that section, a unique archaeological resource is an archaeological artifact, object, or site, about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
(2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
(3) Is directly associated with a scientifically recognized important prehistoric or historic event or person

The resource must also be at least 100 years old and possess "substantial stratigraphic integrity" (i.e. is substantially undisturbed); and the resource involves "important research questions that historical research has shown can be answered only with archaeological methods".

It is important to note that if it is proven that an archaeological resource is neither a historical or unique resource the effects of the project on those resources shall not be considered a significant effect on the environment, and no further CEQA review is required (14 CCR 15064.5).

PRC § 5024 and § 5024.5

As a state agency, DPR is also required to follow PRC § 5024 and PRC § 5024.5 when it comes to resource management. As of 1982, PRC § 5024 requires each state agency to make a good faith effort to formulate policies to preserve and maintain all state-owned historical resources under its jurisdiction, and to submit to the State Historic Preservation Officer (SHPO) an inventory of all state-owned structures over 50 years of age under its jurisdiction. Additionally, PRC § 5024 permits the SHPO to determine which historical resources identified in inventories meet National Register of Historic Places and state historical landmark criteria for inclusion on the master list of historical resources. The SHPO will maintain this master list comprised of all inventoried structures submitted and determined significant pursuant to subsection (d) of PRC § 5024 along with all state-owned historical resources currently listed in the National Register or registered as a state historical landmark under state agency jurisdiction. In an effort to keep an updated master list, each state agency is required to submit inventory updates to the SHPO along with an annual report of preservation activities. The SHPO shall provide state agencies with advice and assistance as needed with regards to historical resources for instance, during projects that may affect historical resources listed in or eligible to the National Register, or registered or eligible as a state historical landmark. DPR has had an active and on-going historic preservation program with the SHPO since January 1982 and is required to submit annual inventory updates as well as the preservation and protection measures of historical resources to SHPO (CA-DPR 2011; CA-OHP 1999).

It is DPR policy to require a 5024 Cultural Review of DPR-related projects to effectively preserve and maintain all state-owned historical resources under its jurisdiction. With this in mind, it is recommended that the Project Manager(s) contact an OHMVR Division archaeologist prior to drafting the Project Evaluation Form (PEF). The PEF-DPR 183 form is used by DPR to initiate environmental review of certain projects, to record resource specialist input on the project's potential to cause adverse environmental impacts, and to contribute to or support a decision as to the appropriate environmental document (Categorical Exemption, Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report) required for compliance with CEQA. Open communication between the Project Manager(s) and an OHMVR Division archaeologist helps to ensure that a project is designed in such a way that it either completely avoids impacting a site or has very minimal site impacts. When a Cultural Resource Specialist conducts a 5024 Review of a project it is their responsibility to ensure it occurs according to the Secretary of the Interior's Standards. These Standards are implemented nation-wide and are used by the Office of Historic Preservation and public agencies to help ensure projects are reviewed, and to promote responsible preservation practices that help protect resources. Most importantly, when a project will affect state-owned historical resources, as described in Public Resources Code 5024, and the lead agency is a state agency, the lead agency shall consult with the State Historic Preservation Officer as provided in PRC § 5024.5 (14 CCR 15064.5).

The 5024 Review will generate a 5024 Report that will be affixed to the PEF. This report includes detail about the prehistory and/or history of the project area, details of known sites within the project area, whether or not there will be project impacts to known sites, and recommendations for either avoiding or minimizing site impacts according to the Secretary of Interior's Standards. CEQA § 21083.2 Archaeological Resources also provides appropriate resource protection standards such as capping or covering archaeological sites with a layer of soil before developing on the site as a form of minimizing site impact. The 5024 Review along with the Report ensures DPR's compliance with CEQA Guidelines and PRC § 5024.

A thorough 5024 Review of a project is contingent upon the Project Manager(s) involving an OHMVR Division archaeologist early on in the project development phase, specifically the early design phase. This includes meetings between the Project Manager(s) and an OHMVR Division archaeologist at the project area with project design maps in hand to discuss the placement of buildings and structures and/or possible ground disturbance. Additionally, OHMVR Division archaeologists frequently communicate with local Native American Tribal affiliates and they are commonly invited to attend these project meetings to ensure resources are protected to the highest standards. It is during these early project meetings where recommendations and mitigations to avoid or lessen impacts to known resources within the project area are discussed and documented in the PEF.

Department of Parks and Recreation Native American Consultation Policy and Implementation

It is the Department's policy to involve Native California Indian groups in all plans and practices that have impacts on the cultural resources under the Department's stewardship. Prior to implementing projects or policies that may have impacts to Native American sites within the State Park System; the Department will actively consult with local Native California Indian groups regarding the protection, preservation, and/or mitigation of cultural sites and sacred places in the State Park System. Departmental Notice 2007 *Native American Consultation Policy and Implementation Procedures* identifies the following nine areas of activity where consultation between local Native California Indian groups and California State Parks is required:

1. Acquisition of properties where cultural sites are present
2. During the General Plan process and/or development of Management Plans
3. Planning, design, and implementation of capital outlay projects
4. Issues of concern identified by the tribes
5. Plant and mineral gathering by Native people
6. Access to Native California Indian ceremonial sites
7. Archaeological permitting
8. Mitigation of vandalism and development of protective measures at Native American sites
9. When using the Native voice in presenting the story of California native Indian people in park units

Executive Order B-10-11

In September of 2011 California Governor Edmund G. Brown Jr. filed with the Office of the Secretary of the State Executive Order B-10-11. This Executive Order acknowledges the important relationship that many Native American California Tribes have with their native home of California. As described in the Executive Order, the term "Tribes" includes all Federally Recognized Tribes and additional California Native Americans. The Executive Order affirms that the State of California recognizes and reaffirms the inherent right of these Tribes to exercise sovereign authority over their members and territory. Most importantly, it is ordered that it is the policy of this Administration that every state agency and department subject to Governor Edmund G. Brown's control shall encourage communication and consultation with California Indian Tribes.

ARCHAEOLOGICAL CONTEXT

Prehistoric Overview

The chronological sequence for the Mojave Desert includes six chronological periods: Lake Mojave Complex, Pinto Complex, Deadman Lake Complex, Gypsum Complex, Rose Spring Complex and a Late Prehistoric Complex (Warren 1980 and 1984; Warren and Crabtree 1986; Sutton et al. 2007). The following section outlines this chronological sequence adapted from Warren (1980 and 1984) Waren and Crabtree (1986), and Sutton et al. (2007) for the Mojave Desert.

Chronological Sequence

Paleo-Indian Cultural Complex (ca. 12,000 to 10,000 B.P.) There is a lack of strong evidence for human occupation of the western Mojave Desert prior to the early Holocene. Pre-Holocene occupation sites, for instance those identified in Tule Springs (Harrington and Simpson 1961), Lake China (Davis 1978), and Lake Mani (Simpson 1958, 1960, 1961) remain unsupported by further convincing archaeological data. The Paleo-Indian Period for this region dates from 12,000 to 10,000 B.P. or the Terminal Pleistocene. This period was a time of extreme environmental change as the cooler, wetter conditions of the Terminal Pleistocene transitioned into the warmer and drier Holocene. This time period is also distinguished by large fluted Clovis projectile points and related hunting material occurring in the archaeological record, all of which are commonly viewed as representing Big Game Hunting Tradition focused on the exploitation of Pleistocene mega fauna (Moratto 1984: 79). This period lacks substantiated evidence of milling equipment, although a variety of plant resources and small game were also exploited (Sutton 1996: 227). Fluted points occur more frequently in the northern Mojave Desert than in the west with higher occurrence frequencies around the shorelines of Pleistocene lakes, for instance a single Clovis occupation site identified at Lake China (Davis 1978; Davis and Panlaqui 1978a, 1978b, 1978c; Sutton et al. 2007:233-234). Our understanding of this time period is poor since evidence for this culture has been developed from a few isolated finds. It has been suggested that the people of this culture were "highly mobile, living in small, temporary camps located near (then) permanent water sources" (Sutton et al. 2007:234).

Lake Mojave Cultural Complex (ca. 10,000 to 8,000 B.P.) Cultural materials dating to this time period have been assigned to the Playa and Malpais cultures (Rogers 1939), the San Dieguito Complex (Warren 1967), and the Lake Mojave Complex (Warren and Crabtree 1986). Assemblages associated to the Lake Mojave Cultural Complex were first identified at Lake Mojave (Campbell et al. 1937) and include Lake Mojave series projectile points (leaf-shaped, long stemmed projectile points with narrow shoulders) and Silver Lake projectile points (short bladed, stemmed pointed with distinct shoulders). Additional diagnostic items associated with the Lake Mojave Complex include Great Basin stemmed points, bifaces, scrapers, gravers, perforators, and additional heavy core tools, in addition to flaked stone crescents and the occasional ground stone tool (Sutton et al. 2007:234).

In the Mojave Desert this assemblage is typically found adjacent to ancient lakes, and most of the studied components of this time period are surface finds that lack datable artifacts. The largest collections of radiocarbon dates for this time period have come from the Fort Irwin area (Basgall and Hall 1994). During this time period, the environment was gradually changing. The remnant pluvial lakes from the Pleistocene were disappearing and new environments were taking hold. This uncertainty in resource patches can be seen in the tools found from sites representing this time period. Large bifacial and unifacial tools appear to have been curated and reworked for a long period of time and were transported during the seasonal foraging travels. Although groundstone artifacts occur during this time period, the wear patterns on the recovered artifacts suggest a low reliance on plant resources (Sutton et al. 2007:237). Groups during this time period would have consisted of small, highly mobile camps that practiced a forager-like strategy in order to monitor resource availability. The availability of rich resources would have greatly influenced camp placement (Sutton et al. 2007). Overall, this phase is considered ancestral to the Early Archaic cultures of the Pinto period, and represents a shift toward a more diversified and generalized economy (Sutton 1996: 228).

Pinto Cultural Complex (ca. 8,000 to 5,000 B.C.) During the Middle Holocene, the chronologies are more complex and difficult to define. Sites from this time period have been located across a wide range of topographic and environmental zones. Water was the determining factor for long-term habitation sites. It has been suggested that "it may be significant that the Pinto Complex emerged subsequent to the most dramatic climatic fluctuations of the Early Holocene, after which biotic conditions presumably became more predictable" (Sutton et al. 2007:238-239). The primary cultural complex associated from 8,000 to 5,000 BP was the Pinto Complex which is assumed to have neatly followed or even overlapped with the Lake Mojave Complex (Sutton et al. 2007:238). This period is marked by the appearance of Pinto series projectile points and named for the Pinto Basin Site, and are characterized as thick, shouldered, expanding stem points with concave bases, and are usually produced by percussion reduction methods with limited pressure retouch (Campbell and Campbell 1935).

Warren (1984) sees this period as marking the beginnings of cultural adaptation to the desert, as materials characteristic of the Pinto period gradually replace those of the preceding Lake Mojave period. Major technological shifts include the appearance of Pinto points and domed scrapers. Similar tool curation and reworking is seen during this time period. There is the Pinto series projectile point that was used for spears rather than darts. The presence of *Olivella* shell beads suggests interaction with groups across the region, however reduced toolstone source diversity implies a reduction in foraging ranges (Sutton et al. 2007:238). Groundstone implements appear to be more important and used during this time period and are present in almost all recorded Pinto deposits. Warren (1990) theorizes the increase of milling implements coincided with the development to the exploitation of hard seeds, which is seen as a part of a process of subsistence diversification brought on by increased aridity and reduced ecosystem carrying capacity.

Sites associated with this period are usually found in open settings near water sources and are large and contain midden features; evidence of long-term occupational periods (Sutton et al. 2007). Also evident in the archaeological record is a transition from big game hunting to a more broadly based economy (Sutton 1996: 231). Small rodents and reptile faunal along with freshwater mussel have been identified in Pinto period archaeological contexts (Sutton 1996: 232).

Deadman Lake Cultural Complex (ca. 9,500 to 7,200 B.P.) The Deadman Lake Cultural Complex appears to have been a separate cultural complex during the Middle Holocene and was proposed for the first time by Sutton et al. (2007:239). Radiocarbon dates from this cultural deposit place it between ca. 9,500 to 7,200 BP This cultural complex has only been recognized at the Twenty-nine Palms area in the southeastern Mojave Desert. It is different from the Pinto Complex in that assemblages are "characterized by small- to medium-size contracting-stemmed or lozenge-shaped points, extensive concentrations of battered cobbles and core tools, abundant bifaces, simple flake tools, and milling implements" (Sutton et al. 2007:239). However, the Deadman Lake Complex is possibly a local occurrence primarily because "comparable assemblages are yet to be reported from other regions of the Mojave Desert" (Sutton et al. 2007:239). A possible sampling bias could exist in the archaeological literature where the Deadman Lake Complex has simply been unrecognized, but until such a bias can be confirmed Sutton suggests that "any characterization of the broader cultural system must be provisional at best" (Sutton et al. 2007:239).

Towards the end of the Middle Holocene, or 5,000 to 4,000 BP, environmental conditions became hotter and drier in the Mojave Desert and there are few recorded archaeological sites from this time period. Many researchers suggest there was a 1,000-year "hiatus" between the Pinto and Deadman Lake Complexes and the later Gypsum Complex. It has been suggested that population densities were very low during this time period and some areas were largely abandoned (Sutton et al. 2007:241).

The Gypsum Cultural Complex (ca. 4,000 to 1730 B.P.) The Late Holocene is well documented throughout the Great Basin. The beginning of the Late Holocene was wetter and cooler than the Middle Holocene, most notably the barren pans in the Mojave Sink episodically held perennial water. An increase in moisture levels would have likely created favorable living conditions in the desert, and likely influenced changes in cultural adaptations such as population, trade, and social complexity (Spaulding 1995; Sutton 1996: 232).
The Gypsum Complex is the earliest Late Holocene complex dating from 4000 BP and 1730 BP. This period is marked by population increases and broadening economic activities as technological adaptation to the desert

environment evolved. Hunting practices continued and the processing of plant resources increased in practice and is evident by the high volume and diversity of ground stone artifacts in the archaeological record. Sites were open and the use of rock shelters increased during this time. Base camps located near water resources and near substantial subsistence resources occur with extensive midden deposits. Additional site types include special purpose sites located in upland settings also occur during this period (Warren 1984; Warren and Crabtree 1986). There are very few deep deposits from this time period which suggests highly transient groups moving across the region (Sutton et al. 2007:241). Sutton claims

> Gypsum components tend to be smaller but somewhat more numerous than those of preceding occupations and are found over a more diverse array of locations. Along with the marker projectile point types, artifact assemblages include evidence of ritual activities, such as quartz crystals, paint, and rock art, as well as numerous bifaces. Exploitation of artiodactyls, lagomorphs, and rodents is evident from a number of Gypsum Complex sites [Sutton et al. 2007:241]

This cultural complex is "defined by the presence of a range of corner-notched (Elko series), concave base (Humboldt series), and well-shouldered contracting stemmed (Gypsum series) point forms" (Sutton et al. 2007:241). Additional artifacts associated to this period include: rectangular-based knives, flake scrapers, occasional large scraper planes, choppers, and hammerstones. Handstones and milling tools continue to be part of the conventional tool kit while the mortar and pestle appear for the first time. Considerable archaeological evidence has been identified that suggests increased contact with the California Coast and the Southwest occurred during this period. Additionally, split-twig figurines and zoomorphic petroglyphs are suggestive of ritualistic practices (Grant et al. 1968).

In the Fort Irwin area, Gypsum period sites have been documented that include faunal assemblages that contain a large number of artiodactyl remains when compared to other later sites. Faunal evidence such as suggests a shift in subsistence orientation and mobility may have occurred along with a decrease in residential mobility near the end of the Gypsum period (Basgall et al. 1988; Sutton 1996: 234). Rock art images have been identified that suggest the hunting of mountain sheep played an important role during the Gypsum period (Grant et al. 1968). Additionally, artiodactyl, lagomorph, rodent, and tortoise remains have all been identified in Gypsum period sites in the central Mojave Desert (Hall and Basgall 1994).

Rose Spring Cultural Context (cal. A.D. 200 to 1100) The transition between the Gypsum Complex into the subsequent Rose Spring Complex was a time of major cultural change across the Mojave Desert. It has been suggested that "the general dating of the Rose Spring Complex is ca. cal A.D. 200 to 1100" (Sutton et al. 2007:241). The bow and arrow were introduced during this time period and the diagnostic projectile points changed to smaller points like the Eastgate and Rose Spring point types that are assumed to be arrowheads. It is generally thought that populations increased across the Mojave during the Rose Spring Complex and is reflected in marked changes in artifact assemblages. Additionally, middens and long-term habitation sites became more frequent and developed. Aside from diagnostic projectile points, it has been suggested that common artifacts of the Rose Spring Complex include "stone knives, drills, pipes, bone awls, various milling implements, marine shell ornaments, and large quantities of obsidian" (Sutton et al. 2007:241). Once again, Rose Spring sites are commonly found near water and "populations appear to have reached their peak during this time" (Sutton et al. 2007:241-242). It has been suggested that "the resource emphasis was clearly on medium to small game, predominantly lagomorphs and rodents" (Sutton et al. 2007:242). Obsidian use increased during this time period and was an important factor that influenced settlement and subsistence patterns. The majority of obsidian used during this time period comes from the Coso Volcanic Field.

It is important to mention that the Medieval Climatic Anomaly (MCA), a significant period of intense drought, began during the middle of the Rose Springs Complex. It intensified and lasted for several hundreds of years and dried many of the lakes in the desert. As a result, subsistence patterns no longer revolved around lakes but rather ephemeral springs and drainages. Additionally, the improvement of the bow and arrow technology might have taken a toll on the resource base as human populations rose. As technology improved and human population numbers rose, the overburdened resource base has been theorized to have declined significantly forcing people to seek out new

resource patches. The overtaxed or stressed environmental conditions during and after the MCA more than likely contributed to the end of the Rose Spring Complex around cal A.D. 1100 (Sutton et al. 2007:242).

The Late Prehistoric Complexes of the Mojave Desert, from about cal A.D. 1100 to historic contact developed in an environment that never fully recovered from the MCA and continued to deteriorate even more. Even though new technologies were introduced, populations appear to have declined (Sutton et al. 2007:242). Two distinct cultural spheres in the region appear at this time

> The northern sphere is characterized by both Desert side-notched and Cottonwood projectile points, brownware ceramics, some buffware near the Mojave River, and the use of obsidian obtained mostly from northern sources (primarily Coso). The eastern sphere is characterized by the presence of both brownware and buffware ceramics, a dominance of Cottonwood projectile points, and the exclusive use of local obsidian sources. For some reason, groups in the eastern Mojave were not participating in the Coso obsidian trade. The area just north of the Mojave River seems to have been the boundary between the two spheres [Sutton et al. 2007:242]

Known archaeological sites from this time period include

> A variety of types, including a few major villages with associated cemeteries, as well as special purpose and seasonal sites. Artifact assemblages consist of Desert series projectile points, buffware and brownware ceramics, shell and steatite beads, slate pendants, incised stones, and a variety of milling tools. Faunal remains typically consist of lagomorphs, deer, rodents, and some reptiles. Obsidian use dropped off significantly, and flaked stone tool manufacture shifted to silicate stone [Sutton et al. 2007:242]

Ethnographic Overview

The project area lies within the Great Basin cultural province but given its proximity to the California cultural province, it is only natural that the prehistoric populations of this area would share many Californian traits (Kroeber 1925). The project area is located within the traditional range of the Nïwï or Kawaiisu people. The Kawaiisu tribe is generally placed within the Great Basin cultural area, but the group shares many similar traits to the California cultural area. The term Kawaiisu is a Yokuts word, but was never used by the people themselves. The most accurate word is Nïwï which is their word for themselves.

The area occupied by this ethnographic group includes several mountain ranges including a portion of the southern Sierra Nevada Mountains, the Piute Mountains, and Tehachapi Mountains. According to Garfinkel and Williams (2011)

> They lived in the far southern Sierra Nevada and the Tehachapi Mountains and occupied a large swath of the western Mohave Desert from Little Lake and the southern Panamint Valley and Death Valley, east to Barstow and south to the Mojave River and Victorville [77]

The group had ties to the San Joaquin Valley and large portions of the western Mojave Desert during their seasonal subsistence rounds. The Kawaiisu were surrounded by the Tubatulabal and Koso (Panamint Shoshone) to the north, the Southern Paiute to the east, the Serrano and Kitanemuk to the south, and the Yokuts tribes to the west in the San Joaquin Valley.

Kroeber estimated that the original population count of the Kawaiisu prior to historic contact was approximately 500 individuals. They were part of the westernmost branch of the Southern Numic Division of languages. The Numic branch was the northern most manifestation of the Uto-Aztecan language family. It is thought that the Kawaiisu lived in this area for approximately 2000 years and manifested during the expansion of Numic speakers in the area. Additionally, the Kawaiisu lack a migration story in their myths, and Sutton hypothesized that they moved into the mountains after previously living in the western Mojave. Drier conditions probably forced them out of the desert and into surrounding areas (Sampson 2006; Zigmond 1986).

The Kawaiisu relied on hunting and gathering for subsistence. They gathered acorns and pinyon pine nuts in the fall and seed-producing plants in the spring (Garfinkel and Williams 2011:78). Important vegetal resources included oak (*Quercus spp.*), juniper (*Juniperus spp*.), Bull Pine (*Pinus sabiniana*), pinyon pine (*Pinus monophylla*), yucca (*Yucca brevifolia* and *Y. whipplei*), Indian rice grass (*Achnatherum hymenoides*), tick seed (*Coreopsis bigelovii*), blazing star (*Mentzelia spp*.), tansy mustard (*Descurainia pinnata*), and chia (*Salvia columbariae* and *S. carduacea*) (Garfinkel and Williams 2011:78-79). Bighorn sheep, deer, pronghorn antelope, jackrabbits, quail, fish, and chuckwallas were also important game.

Because of their reliance on the annual availability of plants and animals, the Kawaiisu adopted a seasonal migration pattern

> Summer was a period where there was considerable mobility and fall was spent in the higher mountains gathering acorns and pinyon nuts. The Kawaiisu, like other California foraging groups, occupied permanent winter village sites located at reliable water sources that would permit leaching of acorns. Winter villages were the sites of fiestas and mourning ceremonies that were held after the fall harvest of tree crops. During the spring, summer, and fall, smaller groups of related individuals set up temporary camps for foraging and/or hunting. Village sites often featured bedrock milling locations for the processing of acorns. Pinyon pine nut gathering camps, temporarily occupied in the fall, featured cone roasting pits and sometimes nut grinding bedrock slicks as well [Garfinkel and Williams 2011:78]

This group did not recognize tribal cohesion as is seen in neighboring Californian groups like the Yokuts. Garfinkel and Williams (2011) suggest that "chiefs were known but no single individual united the Kawaiisu as a whole" (80). The Kawaiisu were organized at the family level and these families would search for food together and cooperate with related families for various economic necessities (Sampson 2006:9-10).

Structures created and used by this group included a winter house, summer house, sweathouse, a temporary brush enclosure, and granaries for food storage (Sampson 2006:10; Zigmond 1986).

Garfinkel and Williams (2011) provide a recent report dedicated solely to the Kawaiisu with a chapter on place names. Hava-yugwi-nü-wa=ika meant "old road or trail around Butterbredt Canyon" (39). Jawbone Canyon was called either moko-havi-dü or shiga-vü and refers to the pictographs recorded on the higher ridges at the head of the canyon (Garfinkel and Williams 2011:40). This ridge "commemorates when Chipmunk was hunting and saw a deer at the bottom of the canyon and slid down the mountain with his tail making a trench in order to get a better shot at the game (Garfinkel and Williams 2011:41). The Jawbone Pass was "an area where the Kawaiisu camped when in route to and from Kelso Valley on the way to Koehn Lake" (Garfinkel and Williams 2011:41).

Kelso Canyon was called peelakawi, and it served as an important route between the Kawaiisu and the Tubatulabal ethnographic area on the South Fork of the Kern River (Garfinkel and Williams 2011:41). Kelso Creek that runs through this canyon was called muruna-vi-dï. The entire Kelso Valley region was called paayaa-vi-dü=aka (Garfinkel and Williams 2011:42).

Puguro'oci was a ridge in the Kelso Valley where native Kawaiisu women would pick berries. The word means "dog hole" and a place where Kawaiisu reported to have seen supernatural dogs (Garfinkel and Williams 2011:54).

Sageland, a historic mining town, is just north of the project area along Kelso Valley Road and was called maha-vidi or mah-va'a-di. There was a native cemetery in the vicinity of Sageland and a large village in a nearby canyon (Garfinkel and Williams 2011:56).

Lander Meadow, the northwestern-most portion of the project area was called pa-wazidi-bi and the largest meadow in the Piute Mountains (Garfinkel and Williams 2011:44).

The first European contact with the Kawaiisu was in 1776 by Fr. Francisco Garcés during his travels from the Colorado River to Mission San Gabriel. While searching for a route from Sonora to the San Joaquin Valley he crossed into Kawaiisu territory on May 11, 1776 (Garfinkel and Williams 2011:69).

The José Palomares expedition traveled through Kawaiisu territory in 1808 and reported that runaways from Missions San Fernando and San Gabriel were given protection by the local natives (Garfinkel and Williams 2011:71). Several other attempts to retrieve mission runaways from Kawaiisu territory continued through the late 1820s.

Joseph Walker, a fur trapper entered the area in 1834 and features like Walker Basin and Walker Pass are attributed to him. John C. Fremont passed through the area in 1844. Mexican armies were in the area after the decline of the Mission system to quell native raiding of livestock (Garfinkel and Williams 2011:73). American armies further increased pressure on the native groups and "the Kawaiisu found themselves caught in the middle between non-native punitive expeditions and native groups to the west and north which were involved in this raiding" (Garfinkel and Williams 2011:73).

The Gold Rush brought more American settlement into the area in the late 1850s. A survey expedition for the transcontinental railroad began in 1853 across the Tehachapi's. Between 1861-1863 as mining increased and more land was sought to develop, the Koso (Panamint Shoshone) along with some Tubatulabal and Kawaiisu fought back. Captain Moses A. McLaughlin led 908 Native American out of the area to the Sebastian Indian Reservation in 1863, but most of them returned to their native lands (Garfinkel and Williams 2011: 74).

On April 19, 1863, Captain Moses A. McLaughlin along with 44 soldiers arrived at the Indian Rancheria of Paligawan during a native spring ceremony. Local settlers and a local native chief, Joe Chico, had alerted the army of a possible uprising of the local native people against the settlers. Thirty-five defenseless Native American men were singled out and slaughtered by the army (Garfinkel and Williams 2011:43). The women and children hid during the massacre and later buried the deceased. Betty Buckskin, who married an early pioneer Butterbredt, survived the massacre and lived the rest of her years in Kelso Canyon near the current project area.

Violence between settlers and natives continued during this time until the late 1860s. By the end of the Civil War sheep herding became popular and some of the native people were employed in this industry (Garfinkel and Williams 2011:75). According to Garfinkel and Williams (2011), "in 1906, some 40 native people were enumerated at Caliente, with other Kawaiisu and relatives also being recorded at this time, including eight at Paiute Rancheria, 15 at Tehachapi, 23 at Walker Basin, and 30 at Kelso Canyon and Kelso Valley" (75). Towards the end of the 19th century, "native families became increasingly dependent on farming and wage work . . . ranch and cattle work was particularly important. . . . Kawaiisu families continue to reside in the Monolith/Tehachapi areas and at the Paiute Mountain Rancherias during the 20th century" (Garfinkel and Williams 2011:75-76).

Historic Overview

The first Spanish explorer given credit to enter the desert environs of Kern County was Francisco Garces, a Spanish priest. Instead of partaking in Juan Bautista de Anza's 1776 expedition, he traveled the area alone with one Indian guide (Peirson 1956:1). He explored the Mojave River, Kern River, Mojave Desert, and discovered a pass between the Tehachapi Mountains and Sierra Nevada. Although there are conflicting dates, Jedediah Strong Smith is also credited as an early pioneer in the area being the first American to cross the Mojave Desert around 1826 (Peirson 1956:2). Another explorer, Joseph Reddeford Walker was on the scene in 1834, and Walker's Pass that leads from Kern County's desert area into the San Joaquin Valley is named after him (Peirson 1956:2-3). John C. Fremont passed through the area in the 1840s and named the Mojave River (Peirson 1956:3-4).

The western Mojave Desert, in its earliest times, was an important travel corridor for prehistoric people because of the availability of water in an otherwise arid environment. Early Gold Rush miners, pioneers and immigrants used those prehistoric trails to travel across the desert. Shipments and provisions for the Gold Rush were shipped across present-day Red Rock Canyon SP. The mountain range in the park was termed El Paso during this time period.

Accounts claim "a freight station and stage stop was established near Ricardo Campground in the present day park by 1873" (Sampson 2006:11).

Kelso Valley in the project area was named after John W. Kelso, a merchant in Keyesville (Darling 1988:66). He transported his supplies "by freight wagon from Los Angeles to the Kern River mines in the 1850's" (Darling 1988:66). In 1857, he was transporting 5,000 pounds of goods at a time (Hensher 2002:67). From Los Angeles, the freight wagons could "head up Jawbone Canyon and then pass through Butterbredt Canyon and Kelso Valley to the south fork of the Kern River" (Hensher 2002:41).

A wave of miners poured into this area in the 1850's, and "while the majority of travelers to Kern River went by way of Fort Tejon, heavy teams also went through the desert, Jawbone Canyon, and Kelso Valley" (Barras 1976:25). Local mines sprouted up during this time. Sageland is just north of the project area along Kelso Valley Road and was a historic mining town and supply center associated with the St. John, Burning Moscow, and Hortensia mines (Garfinkel and Williams 2011:56). It was settled in 1864. Butterbredt Canyon, portions of which are in the project area, was named after an early pioneer, Frederick Butterbredt, Sr. (Garfinkel and Williams 2011:39). Butterbredt was born in Germany and immigrated to the region during the area's early mining development. He married Betty Buckskin who was born in Kelso Canyon and survived the Keysville McLaughlin Massacre (Garfinkel and Williams 2011:39, 41, 43).

According to C. Hart Merriam

> Mr. Butterbredt, his Indian wife, her mother, and grandmother lived at a ranch in the canyon on Kelso Creek about eight miles south of Weldon. Butterbredt had received a homestead patent in 1901 for the northwest quarter of Section 27, T27S, R35E, MDBM, at the confluence of Kelso and Pinyon Creeks, and this was presumably the site of the ranch [Garfinkel and Williams 2011:41]

This would place the old Butterbredt homestead approximately 8 miles north of the project area along Kelso Valley Road.

The railroad came through the desert in 1876 and the town of Mojave was formed (Peirson 1956:5). The railroad bought people and business to the desert. Early borax mining took place on Borax Lake, now Searles Lake (80 miles from Mojave), and shipments were transported through Mojave (Peirson 1956:5). In 1890, gold was discovered and a mini-Gold Rush spread through the Mojave Desert area but was short-lived.

During the early 1900's the area thrived as the Los Angeles Aqueduct was constructed to bring water from the Owens River to Los Angeles (Peirson 1956:7). Mining throughout the area began again in the 1930s. New mining was triggered by the Great Depression. The settlement patterns became more permanent than the relatively intermittent mining lifestyle that had preceded it. Important mines in the area include Grubstake Hill, the Golden Rule, Pasadena Mine, the Daly Claim, and Florence #7 (Sampson 2006:11). Mining for pumicite, an active ingredient for certain household cleansers, took place near Last Chance Canyon in Red Rock Canyon SP. Mining took place in the hills of Jawbone Canyon as late as 1939 (Darling 1988:63).

The military also played an important role in the development of the area. A Navy air base was established during World War II near Mojave (Peirson 1956:8). Additionally, the installation of the Air Force base at Edwards, CA has also added development.

STUDY METHODS

Records and Literature Search

A record search was conducted of the project area at the Southern San Joaquin Valley Information Center (CSU, Bakersfield) of the California Historical Resources Information System on January 20, 2011 by Associate State Archaeologists Kelly Long and Alicia Perez. The Southern San Joaquin Valley Information Center, an affiliate of the State of California Office of Historic Preservation (CA-OHP), is the official state repository of archaeological and historical records and reports for Kern County. Included in the literature review were the *California Points of Historical Interest* (1992) and the *Historic Properties Directory* (through June 16, 2006). The *Historic Properties Directory* includes updated listings of the National Register of Historic Places, the California Historical Landmarks, the California Register of Historical Resources, and the California Points of Historical Interest.

An additional record search was conducted for this phase of the project at the Bureau of Land Management's (BLM) Ridgecrest Field Office on October 3, 2011 by Kelly and Alicia. OHMVR Division archaeologists met with BLM archaeologists to discuss the project and exchange information. Additional research was conducted using the files and literature of the OHMVR Division cultural resource library. Supplemental prehistoric and historic background information was gathered from the California State Library in Sacramento.

On February 16, 2011 and on April 26, 2012 OHMVR Division archaeologists contacted the Native American Heritage Commission (NAHC) to request a record search of their sacred lands files. The NAHC reported no previously recorded sacred areas were known to exist within areas of the project boundary. Copies of this correspondence are located in Appendix A. The NAHC also provided a recent list of Native American individuals/organizations that may have knowledge of cultural resources within the project boundary. Certified letters were mailed to all individuals and organizations on the NAHC contact list on March 17, 2011. Copies of the correspondence are also located in Appendix A. The OHMVR Division did not receive any response and all individuals and organizations were again contacted via email on April 27, 2011. Several of the emails failed to send and phone calls were made to these individuals. From this third attempt at Tribal consultation, Tribal Chairwoman, Donna Begay with the Tubatulabals of Kern Valley contacted Alicia Perez on April 27, 2011. A Native American consultation meeting with Donna Begay occurred on August 8, 2011 at Hungry Valley SVRA. Associate State Archaeologists Alicia Perez and Kelly Long were accompanied by Senior Environmental Scientist Kim Matthews and Environmental Scientist Chris Hon. The objectives for this initial consultation meeting was to provide Donna with an overview of the project description and results from the cultural resource inventory of the project area. Donna provided the OHMVR Division with GIS data of all known sites within and adjacent to the project boundary. Additional consultation letters were sent to all individuals and organizations on the NAHC contact list on May 7, 2012. Only Chairperson, Katherine Montes-Morgan with the Tejon Indian Tribe responded and indicated that although "the Tejon Indian Tribe has no conflict with the proposed project, but wants to be contacted if sites are located in project area". Alicia Perez called Katherine Montes-Morgan on July 17, 2012 to provide the Tejon Indian Tribe with the results of the cultural resource inventory. To date, the Tejon Indian Tribe has not contacted the OHMVR Division. As the date of this report, consultation with the Tubatulabals of Kern Valley continues.

The record search, literature review, and Native American consultation was conducted to accomplish the following: (1) to identify previously recorded or known archaeological or historical resources within the project area; and (2) to determine the likelihood of unrecorded resources based on historical references, Native American consultation, and the distribution and environmental settings of nearby sites.

The record search conducted at the Southern San Joaquin Valley Information Center, BLM Ridgecrest Field Office, and consultation with Donna Begay identified 18 previously recorded sites within the project area; six prehistoric resources, 9 historic-era resources and two multi-component resources, (Table 1) (Figure 2). One resource's occupation period is unknown. Approximately five previous archaeological surveys have been conducted within the project area (Table 2).

Table 1. Previously Recorded Sites Within the Project Area

TRINOMIAL #	PRIMARY #	DATE (Recorded/ Updated)	RECORDED BY	Resource
CA-KER-208/H		1950	G. Guthrie	AP4. Bedrock milling feature, AP15. Habitation debris, AH4. Privies/dumps/trash scatters, AH10. Machinery, AH16. other
CA-KER-913	P-15-000913	2002	M. Richards, S. Dietler, N. Tabares	AP2. Lithic scatter, AP4. Bedrock milling features, AP5. Petroglyphs, AP6. Pictographs
CA-5944H		2003	J. Nelson	AH9. Mines, AH11. Walls/fences, AH15. Standing structures
CA-KER-6393H		2002	B. Brown	AH4. Trash scatter
CA-KER-7025	P-15-012438	2006	J. Lloyd (Applied Earthworks)	AP2. Lithic scatter, AP3. Ceramic scatter, AP4. Bedrock milling features, AP6. Pictograph, AP15. Habitation debris
CA-KER-7127H		2002	R. Bevill	AH2. Foundations, AH4. Trash scatters
CA-KER-7153H	P-15-012695	2002	D. Tyree	AH2. Foundations, AH4. Trash scatter
CA-KER-7154H	P-15-012696	2002	M. Hale, S. Lippman	AH2. Foundations
CA-KER-7900H	P-15-014142	2009	D. Tyree	AH9. Mine shaft and tailings
CA-KER-7902			D. Tyree	AP2. Lithic scatter, AP4. Bedrock milling features, AP16. other
	P-15-007212			Unknown
	P-15-010464	2002	M. Richards	AP2. Lithic
	P-15-011101	2002	M. Richards, C. Backes, A. Tabares	AP2. Lithic
Butterbredt Well Locus A		2009	D. Tyree	AH5. Wells/cisterns
Butterbredt Well Locus B		2009	D. Tyree	AH5. Wells/cisterns
JBB-16 (Alphie Springs)		2009	D. Tyree	AH2. Foundations, AH4. Trash, AH5. Well, AH6. Water conveyance, AH7. Road, AH9. Mine adits, AH11. Fence, AP2. Lithic scatter, AP15. Habitation debris
JBB-36		2009	D. Tyree	AP4. Bedrock milling features
JBB-50H		2010	D. Tyree	HP35. CCC Property, AH5. Wells

Figure 2. Previously Recorded Sites Within Project Area

Table 2. Previous Archaeological Studies Within Project Boundary

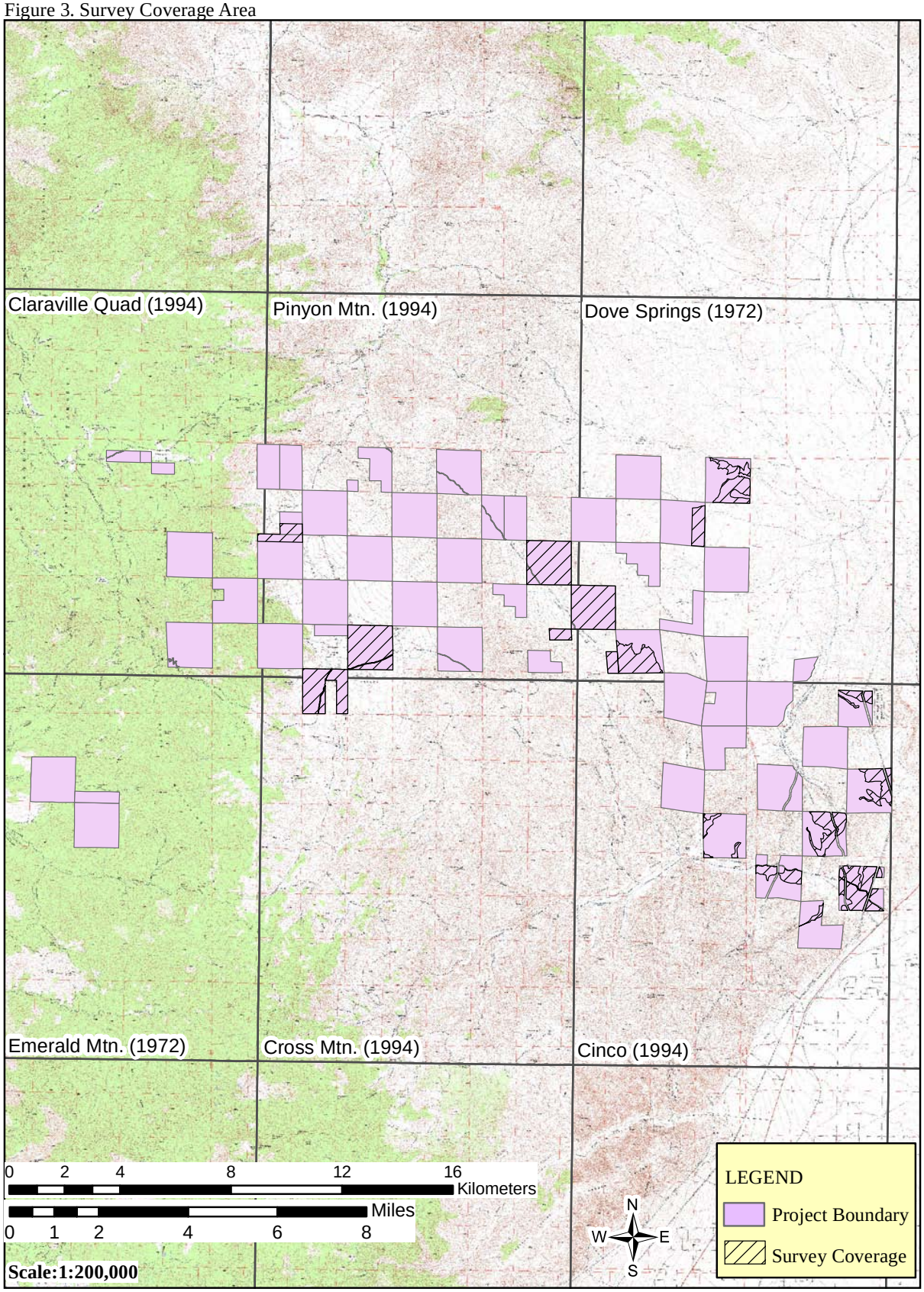
Date Published	Author/Agency	Report Name	Site(s) Referenced
2003	URS Corporation	Archaeological Inventory Within the Jawbone Area of Critical Environmental Concern (ACEC), Kern County, California	KER-5944H, -6393H
2002	URS Corporation	Archaeological Inventory of the First and Second Los Angeles Aqueducts and Selected Access Roads, Kern, Inyo, and Los Angeles Counties, California	KER-7127H, -7154H
2011	BLM Ridgecrest Office	Unpublished Cultural Resource Inventory Report	KER-913
2002	Ancient Enterprises	Cultural Resources Survey Report for the Bureau of Land Management Open Areas Within the Jawbone/Butterbredt Area of Critical Environmental Concern, Dove Springs Open Area and Jawbone Canyon State Park, Kern County, California	KER-913, P-15-010464, P-15-011101
2009	BLM Ridgecrest Office	OHV Route SC-176 Jawbone-Butterbredt ACEC Project #CA-650-2009-39	KER-7900H, -7901H

Field Methods and Results

The project area encompasses approximately 28,000 acres. DPR Associate State Archaeologists, Alicia Perez and Kelly Long, Assistant State Archaeologist Margaret Kress and Archaeological Project Lead Joanna Collier with the OHMVR Division, and DPR Associate State Archaeologist Chris Corey and Assistant State Archaeologist Patrick Riordan from the Archaeology, History, & Museums Division participated in the cultural resource survey during the months of March, April and October 2011. Supplemental archaeological field work was completed by Far Western Anthropological Research Group, Inc. in June 2012 (Appendix C).

The purpose of the cultural resource survey was to conduct a complete visual intensive survey of all lands within the project area in order to: A) relocate and update all previously recorded sites; and B) to record newly identified resources. A complete visual intensive survey is one in which archaeologically-trained individuals systematically traverse the area at 10-meter intervals or less, inspecting the ground surface for all evidence of prior human activity. However, a complete visual intensive survey was problematic because of poor ground visibility and steep topography. Additionally, given the immensity of the project area combined with time constraints only 3,508 acres were surveyed by DPR archaeologists and 1,200 acres were surveyed by Far Western archaeologists for a total of 4,708 acres (Figure 3).

Figure 3. Survey Coverage Area



STUDY RESULTS

DPR and Far Western archaeological field work recorded six previously recorded sites and 23 new sites within the project area for a total of 29 sites, 13 of which are prehistoric, one multi-component, and 15 historic-era sites. 63 isolated finds were also recorded; 20 prehistoric, 42 historic-era, and one multi-component (Table 3). All sites were recorded and updated using DPR 523 site records. One Rose Spring Corner-notched obsidian projectile point was collected from CA-KER-7025 and one Cottonwood obsidian projectile point was collected from P-15-015857. The collection is stored at the OHMVR Division HQ in Sacramento. A Trimble GeoExplorer XH was used to record all site boundaries and geographic data. ArcGIS 10 was used to prepare the geographic data for all sites and the State Parks Cultural Resource Geodatabase for the Onyx Ranch Acquisition was used to archive all of the geographic data. All geographic data was collected using North American Datum 1983 and maps were projected using Universal Transverse Mercator, Zone 11. Metadata was prepared for all collected geographic data. Locations of known sites can be found on Figure 4 through Figure 11.

Table 3. Cultural Resources Recorded within Project Boundary

Trinomial or Primary, Resource Name	Prehistoric/ Historic-Era/ Multi-component	Resource Description	Relocated Yes/No
CA-KER-208/H	Multi-component	AP4. Bedrock milling feature, AP15. Habitation debris, AH4. Privies/dumps/trash scatters, AH10. Machinery, AH16. other	No
CA-KER-913	Prehistoric	AP2. Lithic scatter, AP4. Bedrock milling features, AP5. Petroglyphs, AP6. Pictographs	Yes; 10/17/2011& 10/18/2011
CA-KER-5944H	Historic-era	AH9. Mines/quarries/tailings	Yes; 6/17/2012
CA-KER-6393H	Historic-era	AH4. Trash	Yes; 6/14/2012
CA-KER-7025	Prehistoric	AP2. Lithic scatter, AP3. Ceramic scatter, AP4. Bedrock milling features, AP6. Pictograph, AP15. Habitation debris	Yes; 10/19/2011
CA-KER-7127H	Historic-era	AH2. Foundations, AH4. Trash scatter	Yes; 6/17/2012
CA-KER-7153H	Historic-era	AH2. Foundations, AH4. Trash scatter	No
CA-KER-7154H	Historic-era	AH2. Foundations	No
CA-KER-7900H	Historic-era	AH9. Mine shaft and tailings	No
CA-KER-7902	Prehistoric	AP2. Lithic scatter, AP4. Bedrock milling features, AP16. other	No
P-15-007212		Unknown	No
P-15-010464	Prehistoric	AP2. Lithic	No; 10/18/2011
P-15-011101	Prehistoric	AP2. Lithic	No; 10/19/2011
Butterbredt Well Locus A	Historic-era	AH5. Wells/cisterns	No
Butterbredt Well Locus B	Historic-era	AH5. Wells/cisterns	No
JBB-16 (Alphie Springs)	Multi-component	AH2. Foundations, AH4. Trash, AH5. Well, AH6. Water conveyance, AH7. Road, AH9. Mine adits, AH11. Fence, AP2. Lithic scatter, AP15. Habitation debris	No
JBB-36	Prehistoric	AP4. Bedrock milling features	No
JBB-50H	Historic-era	HP35. CCC Property, AH5. Wells	Yes; 10/18/2011
CA-KER-8422 (Butterbredt Grind)	Prehistoric	AP2. Lithic scatter, AP4. Bedrock milling feature	New resource
CA-KER-8423H (Butterbredt Terraces)	Historic-era	AH4. Water conveyance system, AH16. other	New resource
CA-KER-8424 (Grinding with a View)	Prehistoric	AP2. Lithic scatter, AP4. Bedrock milling feature, AP14. Rock shelter/cave, AP15. Habitation debris	New resource
CA-KER-8425H (Mystery Foundations)	Historic-era	AH2. Foundations/structure pads, AH4. Privies/dumps/trash scatters, AH7. Roads/trails/railroad grades, AH9. Mines/quarries/tailings, AH11. Walls/fences	New resource
CA-KER-8426 (Obsidian Bench)	Prehistoric	AP2. Lithic scatter	New resource
CA-KER-8427	Prehistoric	AP4. Bedrock milling feature	New resource

(04192011A)			
Trinomial or Primary, Resource Name	**Prehistoric/ Historic-Era/ Multi-component**	**Resource Description**	**Relocated Yes/No**
CA-KER-8428 (04192011B)	Prehistoric	AP4. Bedrock milling feature	New resource
CA-KER-8715H (Schoolhouse Well)	Historic-era	AH3. Landscaping/orchard, AH5. Wells/cisterns, AH6. Water conveyance system, AH10. Machinery, AH16. Other	New resource
CA-KER-8716/H (The Edge of Glory Site)	Multi-component	AH4. Privies/dumps/trash scatters, AP2. Lithic scatter, AP4. Bedrock milling feature	New resource
CA-KER-8718H (10182011A)	Historic-era	AH2, AH3. Landscaping/orchard AH4. Privies/dumps/trash scatters, AH5. Wells/cisterns	New resource
CA-KER-8719H Little Stone House on (the Prairie)	Historic-era	AH15. Standing structure	New resource
CA-KER-8720 (Joanna's Flake Site)	Prehistoric	AP2. Lithic scatter	New resource
CA-KER-8721 (Joanna's Milling Station)	Prehistoric	AP4. Bedrock milling feature	New resource
STH-01	Historic-era	AH4. Privies/dumps/trash scatters, AH9. Mines/quarries/tailings	New resource
STH-02	Prehistoric	AP2. Lithic scatter	New resource
STH-03	Historic-era	AH4. Privies/dumps/trash scatters	New resource
STH-04	Historic-era	AH4. Privies/dumps/trash scatters	New resource
STH-05	Historic-era	AH4. Privies/dumps/trash scatters	New resource
STH-06	Prehistoric	AP2. Lithic scatter	New resource
STS-01	Prehistoric	AP2. Lithic scatter	New resource
STS-02	Historic-era	AH4. Privies/dumps/trash scatters	New resource
STS-03	Historic-era	AH4. Privies/dumps/trash scatters	New resource
STS-04	Prehistoric	AP2. Lithic scatter, AP11. Hearths/pits	New resource
CA-KER-8717H (10172011C)	Historic-era isolate	AH6. Water conveyance system, AH7. Roads/trails/railroad grades	New resource
P-15-015213 (Margaret's Pestle)	Prehistoric isolate	AP2. Lithic scatter	New resource
P-15-015218 (04192011C)	Historic-era isolate	AH9. Mines/quarries/tailings	New resource
P-15-015856 (10182011B)	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
P-15-015857 (10192011A)	Prehistoric isolate	AP2. Lithic scatter	New resource
P-15-015860 (Margaret's Mano Isolate)	Prehistoric isolate	AP2. Lithic scatter	New resource
P-15-015861 (Red Chert Core Isolate)	Prehistoric isolate	AP2. Lithic scatter	New resource
Historic 1	Historic-era isolate	AH5. Wells/cisterns	New resource
Historic 2	Historic-era isolate	AH5. Wells/cisterns	New resource
ITH-01	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-03	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-04	Multi-component	AP2. Lithic scatter, AH4. Privies/dumps/trash scatters	New resource
ITH-05	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-06	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-07	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-08	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-09	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-10	Historic-era	AH4. Privies/dumps/trash scatters	New resource

	isolate		
Trinomial or Primary, Resource Name	**Prehistoric/ Historic-Era/ Multi-component**	**Resource Description**	**Relocated Yes/No**
ITH-11	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-12	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-13	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-14	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-15	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-16	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-17	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-18	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-19	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-20	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-21	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-22	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-23	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-24	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-25	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-26	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-27	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-28	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-29	Prehistoric isolate	AP2. Lithic scatter	New resource
ITH-30	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-31	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITH-32	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-01	Prehistoric isolate	AP2. Lithic scatter	New resource
ITS-02	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-03	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-04	Prehistoric isolate	AP2. Lithic scatter	New resource
ITS-05	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-06	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-07	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-08	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-09	Prehistoric isolate	AP2. Lithic scatter	New resource
ITS-10	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-11	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-12	Prehistoric isolate	AP2. Lithic scatter	New resource

Trinomial or Primary, Resource Name	Prehistoric/ Historic-Era/ Multi-component	Resource Description	Relocated Yes/No
ITS-13	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-14	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-15	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-16	Prehistoric isolate	AP2. Lithic scatter	New resource
ITS-17	Prehistoric isolate	AP2. Lithic scatter	New resource
ITS-18	Prehistoric isolate	AP2. Lithic scatter	New resource
ITS-19	Prehistoric isolate	AP2. Lithic scatter	New resource
ITS-20	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-21	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-22	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource
ITS-23	Historic-era isolate	AH4. Privies/dumps/trash scatters	New resource

Figure 4. Recorded Resources Overview

Figure 5. Recorded Resources

Figure 6. Recorded Resources

Figure 7. Recorded Resources

Figure 8. Recorded Resources

Figure 9. Recorded Resources

Figure 10. Recorded Resources

Figure 11. Recorded Resources

CURRENT CULTURAL RESOURCE CONDITIONS AND CULTURAL RESOURCE MANAGEMENT PROGRAM

Current Cultural Resource Conditions

In pursuant to subsection (b) of 14 CCR 15064.5, a substantial adverse change in the significance of an historical resource because of a project is defined as "the demolition, destruction, relocation, or alteration of a resource or its immediate surroundings such that its significance is materially impaired". In general, a historical resource's significance is materially impaired when it can no longer convey its historical significance and therefore can no longer justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources, the local register of historical resources pursuant to § 5020.1(k) of the Public Resources Code, or its identification in an historical resources survey meeting the requirements of § 5024.1(g) of the Public Resources Code. A substantial adverse change to a historical resource also includes the adverse demolition or material alteration of a historical resource's physical characteristics that convey its historical significance and argue its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for the purpose of CEQA.

Knowledge of which resources within the Onyx Ranch project boundary are eligible for either the National Register of Historic Places or the California Register of Historical Resources identifies the following: (1) resources that will require protection and preservation measures; (2) the level of significant effect to known resources because of a project; and (3) avoidance or mitigation measures to minimize or eliminate significant project impacts according to CEQA, and PRC § 5024 and PRC § 5024.5.

National Register of Historic Places Criteria

The criteria for determining whether a property is eligible for listing in the National Register of Historic Places (NRHP) are found in 36 CFR 60.4 and are reproduced below:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> > A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
> > B. That are associated with the lives of persons significant in our past; or
> > C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinctions; or
> > D. That have yielded, or may be likely to yield, information important in prehistory or history.

For a property to qualify for the NRHP, it must meet at least one of the above National Register Criteria for Evaluation by

> Being associated with an important context *and*
>
> Retaining historic integrity of those features necessary to convey its significance

California Register of Historical Resources Criteria

The California Register of Historical Resources (CRHR) also has a four-criterion approach that mirrors the NRHP. The significance criteria for archaeological and historical sites are defined in the CRHR and are found in the CEQA guidelines (14 CCR 15064.5). For a resource to be eligible for listing in the CRHR, it must be significant at the local, state, or national level in accordance with at least one of the following criteria:

1. Is associated with events contributing to the broad patterns of the state's history or culture; or
2. Is associated with historically important people; or
3. Embodies distinctive characteristics of a type, period, or construction method, or represents the work of a creative individual; or
4. Has the potential for yielding important information on California's history or prehistory.

A resource also has to be at least 50 years old and must possess several of the seven levels of integrity to be eligible for listing in the CRHR. Integrity is defined as "…the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance" (California Office of Historic Preservation 2006a). The seven levels of integrity are location, design, setting, materials, workmanship, feeling, and association. Resources that are listed in the NRHP are automatically eligible for the CRHR (PRC § 5024.1(c)).

Both NRHP and CRHR evaluations must be made within an appropriate historic context. A historic context includes three components: a time period, place, and event. A historic context is developed through one or more research themes to help identify the resources' significance at the local, state, or national level. A resources' integrity is based on its ability to convey its significance through data requirements. Data requirements can best be described as evidence found within the archaeological record that conveys the resources' historical significance. If the appropriate data requirements are lacking, the resource arguably lacks significance and is therefore not an eligible resource.

It was not feasible during this current cultural resource inventory to perform the appropriate level of prehistoric, ethnographic, and historic research to adequately develop research themes to evaluate the recorded resources. However, preliminary field evaluations of the resources' eligibility to both Registers were conducted based on historic context, data potential, and current integrity conditions. For the purpose of simplification, as the NRHP and CRHR criteria are nearly identical, criteria for both have been combined here (e.g., Criterion A/1 would apply to resources that contribute to the broad patterns of national, state, and local history). The eligibility of the prehistoric resources are solely considered under Criterion D/4 and may have additional values under criteria A/1, B/2, and C/3; but these evaluations will require consultation with the local tribal community. Last, isolates were not evaluated as they arguably do not contain extensive data potential.

Table 5. Preliminary Field Evaluations of Recorded Resources

Trinomial/Primary	Historic Context	Data Potential	Current Condition/Integrity	Eligible to the National Register and/or California Register Y/N
CA-KER-913	Cultural affiliation, Chronology, Technology, Settlement, Subsistence	milling stations, pictographs, rock shelters, hearths, midden, lithics, ceramics	Good, likely being impacted by cattle grazing	Yes; D/4
CA-KER-5944H	1880-1914 early mining and prospecting land use history	Mine shafts and adits, standing structures, trash scatters	Good	Yes; D/4
CA-KER-6393H	1880-1914 Los Angeles aqueduct	Can scatter	Poor	Historic context and data potential unknown without further historic research, also evident

				integrity issues
Trinomial/Primary	**Historic Context**	**Data Potential**	**Current Condition/Integrity**	**Eligible to the National Register and/or California Register Y/N**
CA-KER-7025	Cultural affiliation, Chronology, Technology, Settlement, Subsistence	midden, milling stations, pictograph, ceramics, groundstone, flaked stone tools, debitage, faunal remains, hearth features	Fair, cattle graze in the area and fire has disturbed site along with a dozer trail	Yes; D/4
CA-KER-7127H	Jawbone Camp, associated with the Los Angeles aqueduct	Foundations, trash scatter	Poor, evidence of heavy OHV impact and use	Historic context and data potential unknown without further historic research, also evident integrity issues
CA-KER-8422	Subsistence	six bedrock milling features	Good, site is within the fence for the Butterbredt Preserve, cattle grazing, evidence of clay pigeon shooting	Yes; D/4
CA-KER-8423H	1880-1945 ranch or mining land use site	Terraces and trash	Good, cattle grazing occurs	Historic context and data potential unknown without further historic research
CA-KER-8424	Chronology, Technology, Settlement, Subsistence	four milling station features, and one rock shelter feature, midden, obsidian flakes, chert cores, chert flakes	Good, recent shell casings and broken beer bottles, but no damage and minimal disturbance	Yes; D/4
CA-KER-8425H	1914-1945 mining land use site	Foundations, mining evidence	Poor, dirt road has bisected site	Historic context and data potential unknown without further historic research, also evident integrity issues
CA-KER-8426	Technology	Flakes, biface	Fair, dirt road bisects site	Context and data potential unknown without further research, also evident integrity issues
CA-KER-8427	Technology, Subsistence	milling features	Good	Yes; D/4
CA-KER-8428	Technology, Subsistence	milling feature, cupules, obsidian waste flake	Good	Yes; D/4
CA-KER-8715H	1914-1915 windmill land use history site	Well and associated water conveyance features	Fair, cattle grazing and feature rot	Historic context and data potential unknown without further historic research
CA-KER-8716/H	Chronology, Technology, Settlement, Subsistence	bedrock milling features, flakes (obsidian, white chert, chalcedony, and quartzite) and a historic-era dam	Fair, cattle grazing, historic activities have displaced Feature 5.	The prehistoric element is eligible under D/4; it is unknown if the historic-era component is eligible
CA-KER-8718H	1850s Kelso Valley mining land use site	large habitation site with eight habitation features and assorted artifacts	Fair, cattle grazing	Yes; D/4
CA-KER-8719H	Early to mid-20th century Kelso Valley land use and habitation site	Stone structure, rock alignments	Poor, structure almost completely collapsed, also located close to road	Historic context and data potential unknown without further historic research, also evident integrity issues
CA-KER-8720	Technology	flakes scatter (including one with cortex and one shatter) of various material including: chalcedony, chert, and basalt	Good, but in close proximity to trails	Yes; D/4
CA-KER-8721	Subsistence	fifteen milling features and mano	Good, but in close proximity to trails	Yes; D/4
JBB-50H	Civilian Conservation Corps (CCC) from the 1930s-1940	well, water tank, and a barbed-wire enclosure	Poor, graffiti, modern trash, bullet holes	Historic context and data potential unknown without further historic

				research, also evident integrity issues
Trinomial/Primary	**Historic Context**	**Data Potential**	**Current Condition/Integrity**	**Eligible to the National Register and/or California Register Y/N**
STH-01	Work camp associated with the Los Angeles aqueduct, 1885 to post 1945	Mining prospect features, trash scatters	Fair, erosion	Historic context and data potential unknown without further historic research, also evident integrity issues
STH-02	Technology	Flake scatter, one core	Fair, erosion	Context and data potential unknown without further research
STH-03	1885 and 1914 work camp associated with the Los Angeles aqueduct	Can dump	Good	Yes; D/4
STH-04	Post-1945 land use and habitation site	Can dump	Good	Historic context and data potential unknown without further historic research
STH-05	1914 to post-1945 land use and habitation site	Trash scatter	Poor, erosional impacts	Historic context and data potential unknown without further historic research, also evident integrity issues
STH-06	Technology	Lithic scatter and core	Fair, erosional impacts	Context and data potential unknown without further research, also evident integrity issues
STS-01	Technology	Lithic scatter and core	Fair, erosional impacts	Context and data potential unknown without further research, also evident integrity issues
STS-02	1930s-1950s single use dump site	Can dump	Fair	Historic context and data potential unknown without further historic research, also evident integrity issues
STS-03	1914-1931 trash scatter, likely associated with the Los Angeles aqueduct	Can dump	Good	Historic context and data potential unknown without further historic research
STS-04	Technology, habitation	Lithic scatter, handstones, milling slab, and hearths	Fair	Yes; D/4

Cultural Resource Management Program

The Cultural Resource Management Goal for this project is to identify, protect, preserve, and interpret the cultural resources within the project area. The cultural resources within the project area have the potential to contain important information about the prehistoric lifeways of the area as well as yield significant data regarding the historical occupation and land use history of this region. All cultural resources that exist within the project area will be incorporated within the existing OHMVR Division Cultural Resource Management Program and will be subject to the following Cultural Resource Management Guidelines:

1. In accordance with PRC §5024 and PRC §5024.5, known cultural resource will be evaluated according to the NRHP and/or the CRHR criteria. A Determination of Eligibility (DOE) from the State Historic Preservation Officer (SHPO) for listing the resource on the NRHP/CRHR will also be obtained for known resources. If resources are determined to be eligible for NRHP/CRHR, protection measures consistent with

the Secretary of Interior's Standards for the Treatment of Historic Properties and CEQA will be generated. In the event a complete inventory and/or resource evaluations are not feasible, all known cultural resources will be managed as potentially significant for listing in the NRHP/CRHR in accordance with Department policy;

2. Identify significant cultural resources that are in need of data recovery, or are in areas of high risk of impact/vandalism. Initiate a data recovery effort, including surveys, GIS mapping, analysis, and documentation to develop specific management guidelines for the monitoring, site treatment and protection of significant cultural resources;

3. Areas with eligible and/or potentially eligible resources should be set aside as educational and scientific areas with limited and/or controlled public access to prevent further destruction of these heritage treasures;

4. Determine the eligibility of cultural resources within proposed project areas prior to construction. If significant cultural resources are discovered within or adjacent to areas that will be affected by planned or proposed activities, the activities will be designed to avoid or minimize impacts to the identified resources. If cultural resources are discovered inadvertently during construction activities, cease construction activities within and in the vicinity of the find and consult an OHMVR Division archaeologist or other qualified cultural resource specialist to determine the potential significance of the find per NRHP/CRHR criteria. If the find is determined to be significant, develop and implement mitigation measures in consultation with the archaeologist consistent with the Secretary of Interior's Standards for the Treatment of Historic Properties, and CEQA. Mitigations could include avoidance, site capping, project redesign, or data recovery;

5. Maintain appropriate confidentiality of all cultural resources in conformance with Government Code 6254 "Restriction of Archaeological Record Disclosure" and 6254.10 "Information Maintained by Department of Parks and Recreation";

6. Consultation with local California Indian tribes and organizations who are culturally affiliated and connected to the area will occur on a regular basis to ensure productive, collaborative working relationships, especially when considering management practices involving the project area's natural and cultural resources of interest and concern to Native American individuals and communities;

7. Conduct a focused ethnographic study of the project area through archival research and consultation with California Indian tribes and organizations that are culturally affiliated and connected to the area to identify possible traditional cultural properties (TCPs) and additional culturally sensitive and sacred areas; and

8. Conduct a focused archival research on the history of the project area to identify historic context(s) for the historic-era resources located in the project boundary. Identify and record historic buildings, structures, sites, objects, and landscape features for those that lack such documentation. Develop treatment recommendations for significant historic structures and identify compatible and non-compatible uses

Table 6 indicates the recommended future actions required for the proper resource management and preservation of known resources located within the project area. Isolated finds are not included, as they do not likely meet NRHP and CRHR criteria and therefor do not require further resource management or protection.

Table 6. Resource Management and Preservation Recommendations

Trinomial or Primary #/Site Name	Placement of Protection Signs and/or Interpretative Signs	Notify Park Rangers and Other Park Staff to Patrol Site	Restrict Access	Placement of Protective Fencing or Additional Protective Measures	Conduct 5024 Review of Proposed Projects	Native American Consultation	Include in Archaeological Site Stewardship Program
CA-KER-913	X	X	X	X	X	X	X
CA-KER-5944H	X	X	X	X	X		X
CA-KER-6393H					X		X
CA-KER-7025	X	X	X	X	X	X	X
CA-KER-7127H					X		
CA-KER-8422	X	X	X	X	X	X	X
CA-KER-8423H					X		X
CA-KER-8424	X	X	X	X	X	X	X
CA-KER-8425H					X		X
CA-KER-8426			X		X	X	X
CA-KER-8427					X	X	X
CA-KER-8428					X	X	X
CA-KER-8715H		X			X		X
CA-KER-8716/H	X	X	X	X	X	X	X
CA-KER-8718H			X		X		X
CA-KER-8719H	X	X	X	X	X		X
CA-KER-8720					X	X	X
CA-KER-8721					X	X	X
JBB-50H		X			X		X

Trinomial or Primary #/Site Name	Placement of Protection Signs and/or Interpretative Signs	Notify Park Rangers and Other Park Staff to Patrol Site	Restrict Access	Placement of Protective Fencing or Additional Protective Measures	Conduct 5024 Review of Proposed Projects	Native American Consultation	Include in Archaeological Site Stewardship Program
STH-01					X		X
STH-02					X	X	X
STH-03					X		X
STH-04					X		X
STH-05					X		X
STH-06					X	X	X
STS-01					X	X	X
STS-02					X		X
STS-03					X		X
STS-04					X	X	X

Upon acquisition, it is recommended that all areas not included in the current cultural resource survey be examined for cultural resources. If this is not feasible, all future projects proposed in areas that have not been surveyed for cultural resources will require a cultural resource survey along with Native American consultation in accordance with CEQA, PRC § 5024 and §5024.5 and Executive Order B-10-11.

According to CEQA Guidelines, when archaeological resources are located within a project boundary, avoidance or preservation of the known archaeological resource in an undisturbed state is the preferable course of action. CEQA requires the Lead Agency to examine and impose mitigation measures or feasible project alternatives that would avoid or minimize any impacts or potential impacts identified in an EIR or a mitigated Negative Declaration. Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource. A lead agency shall identify potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource (14 CCR 15064.5). In compliance with CEQA, and PRC §5024 and PRC §5024.5 the following mitigations and recommendations will be included in all future proposed development and maintenance projects within the project area.

Preservation in Place

In pursuant to part 14 CCR 15126.4, public agencies should, whenever feasible, seek to avoid damaging effects on any historical resource of an archaeological nature. Planning construction to avoid archaeological sites is an example of how to ensure the preservation in place of archaeological sites, and it is DPR's *preferred* manner for mitigating impacts to archaeological sites. Preservation in place maintains the relationship between artifacts and the archaeological context, and most importantly this option can help to avoid conflict with religious or cultural values of groups associated with the site. Thus, the preferred method to avoid significant project impacts to known

historical resources within the Onyx Ranch project area is for no ground disturbing activities to occur within known cultural resource boundaries or culturally sensitive areas.

Mitigation Monitoring and Reporting Program

PRC § 21081.6 requires that a public agency shall adopt a reporting or monitoring program in order to mitigate or avoid significant effects on the environment under subdivision (a)(1) or adopts a mitigated Negative Declaration. All projects that involve ground disturbing activities within the vicinity of a known culturally sensitive area should have an archaeological monitoring plan drafted and in place prior to the commencement of project activities. This monitoring plan should also include Native American consultation and involvement.

Human Remains

Resources have not been identified within the project area as having Native American human remains on the surface; however, it is not safe to assume that subsurface remains do not exist. In the event that human remains are accidently discovered, the project must come to a complete stop and no further excavation or disturbance of the area or vicinity will occur. The county coroner is to be called immediately to determine that the remains are of Native American ancestry. If the coroner confirms that the remains are Native American, within a 24 hours of the discovery the coroner is to contact the Native American Heritage Commission. The Commission will identify the person(s) believed to be the Most Likely Descendent (MLD), and the MLD will decide, along with the property owner, to appropriate treatment or disposal of the human remains and associated grave goods as provided in PRC § 5097.98. If the Native American Heritage Commission cannot identify the MLD, the MLD fails to make a recommendation, or the property owner rejects the MLD's recommendations, the property owner can rebury the remains and associated burial goods in an area not subject to ground disturbance (14 CCR 15064.5).

Accidental Discoveries

As part of the objectives, criteria, and procedures required by PRC § 21082, provisions for resources accidently discovered during a project will be drafted prior to ground disturbing activities. The provisions should include an immediate evaluation of the find by a qualified state archaeologist. In the event the find is determined to be an historical or unique archaeological resource, avoidance measures or appropriate mitigations will be made by the archaeologist. Work could continue in other parts of the project area while historical or unique archaeological mitigations take place (14 CCR 15064.5).

Native American Consultation and Monitoring

Native American consultation will continue during the immediate, as well as future, proposed projects. Regular consultation with California Indian Tribes and organizations that are culturally affiliated and connected to the region will ensure productive, collaborative working relationships, especially when considering management practices involving the project area's natural and cultural resources.

In addition to the project mitigations and recommendations listed above, it is highly recommended that the following cultural resource management elements are incorporated into the cultural resource management program for this project.

Annual Cultural Resource Management Training

The success of the OHMVR Division Cultural Resource Management Program does not solely rely on the resource management and preservation efforts afforded by Division archaeologists. The success of the Program is also contingent on the involvement of additional Division staff such as Interpreters, Environmental Scientists, Park Rangers, and District Superintendents among further park staff. Annual Cultural Resource Training Workshops have proven to be a viable educational opportunity for park staff to learn about the prehistory, ethnography, and history of the resources located within their particular SVRA. The workshops also include information about the types of archaeology that is found within the SVRA and how to distinguish between an artifact (an item modified by

humans) and a natural object that has not been modified and used by humans. Most importantly, an effective way to manage the discovery of unanticipated archaeological resources is to plan ahead through cultural resource education of SVRA field staff.

Annual workshops by OHMVR Division archaeologists are a good way to educate and familiarize new and old park field staff on how to identify cultural resources and what to do upon their discovery. Because OHMVR Division archaeologists are stationed in the Sacramento Headquarters Office it is important to train park field staff in the basic fundamentals of what they should and should not do with a newly discovered archaeological resource until a qualified archaeologist can assess the find.

The workshop is also designed to provide important information about cultural resource management and protection, with a primary lesson being that cultural resources are non-renewable. Once destroyed or removed from their original location and setting, their integrity is ruined. OHMVR Division archaeologists instruct the field staff to abide by the following rules when an unanticipated resource is discovered: (1) document the geographical location of the resource, (2) take a photograph (although do not photograph human remains), (3) inform a supervisor, and (4) contact an OHMVR Division archaeologist. Most importantly, do not move or remove any element of the resource. In addition to these steps, it is important that the location of the resource is not discussed over the radio and the photographs are not duplicated and/or shared with park staff other than the supervisor.

California Archaeological Site Stewardship Program (CASSP)

The California Archaeological Site Stewardship Program (CASSP) is volunteer archaeological site stewardship program offered through the Society for California Archaeology. The CASSP is utilized by a multitude of state agencies to involve members of the public in an effort to better monitor, preserve, and manage archaeological sites. CASSP is comprised of volunteers who share a common goal and desire to protect California's rich cultural heritage. The objective of this program is to recruit professional archaeologists and trained volunteers as stewards to monitor sites throughout the state. The application of CASSP at the OHMVR Division SVRA's helps to reinforce its ongoing effort to preserve prehistoric and historic-era cultural resources.

A cultural resource inventory provides the most current condition of archaeological resources located within an SVRA; therefore, it is common to initiate CASSP following a cultural resource inventory. To initiate a CASSP, a CASSP representative works with an OHMVR Division archaeologist to identify the stewardship needs and goals of the park, including identifying which archaeological sites would most benefit from ongoing monitoring. Once the goals and needs are established, a CASSP volunteer workshop is held and members of the public participate in a two-day workshop that includes one 8-hour day in a classroom setting and one, in-field training day with an OHMVR Division archaeologist at the park unit. Volunteers receive training in the following areas: CASSP goals, cultural prehistory and history pertaining to the park unit they will be volunteering at, legal requirements, ethical and confidential requirements related to the treatment of archaeological resources, safety in the field, and basic knowledge of archaeological field surveying methods. The benefits of utilizing CASSP to monitor resources include:

- Efficient management and preservation of cultural resources through regular monitoring of site conditions;
- Active preservation of cultural resources through early identification of site impact;
- Early identification of sites that require immediate preservation management, such as fencing for better protection;
- A complete annual inventory of each monitoring visit, including documentation of changes to site condition, and mitigations developed for better site preservation to be included in the annual report to the State Historic Preservation Office; and
- Public outreach and educational opportunities for various user groups, stake holders, and members of the public to learn about archaeology, including its management, and preservation.

The success of the CASSP is contingent upon the commitment, involvement, and oversight of park staff and the OHMVR Division archaeologists. CASSP volunteers require training and guidance to adequately monitor cultural resources. Upon acquisition, the cultural resources within the project area will greatly benefit from CASSP.

PRC 5097.5

Last, because the OHMVR Division's law enforcement officers' deal with the public and the protection of OHMVR Division cultural resources on a daily basis, it is important to mention PRC 5097.5. PRC 5097.5 states that it is illegal for any person to knowingly and willfully excavate or remove, destroy, injure, or deface cultural resources. Furthermore, the crime is a misdemeanor punishable by a fine not to exceed $10,000 and/or county jail time for up to one year. In addition to a fine and/or jail time, the court can order restitution, and restitution will be granted of the commercial and archaeological value of the property.

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NATIVE AMERICAN CONSULTATION
APPENDIX A

DPR 523 ARCHAEOLOGICAL SITE RECORDS
APPENDIX B

ADDENDUM REPORT ON AN ARCHAEOLOGICAL SURVEY FOR THE PROPOSED ONYX RANCH LAND ACQUISITION, KERN COUNTY, CALIFORNIA (2012)
APPENDIX C

APPENDIX K

PRELIMINARY ASSESSMENT OF EROSION HAZARD POTENTIAL FOR EASTERN KERN COUNTY
California Geological Survey

NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., GOVERNOR

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TO: Phil Jenkins, Chief
Off-Highway Motor Vehicle Recreation Division
California State Parks

FROM: Pete Roffers, Engineering Geologist
California Geological Survey

DATE: December 17, 2012

SUBJECT: Preliminary assessment of erosion hazard potential for Eastern Kern County Acquisition

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This memorandum describes the preliminary assessment of erosion hazard potential in the Eastern Kern County Acquisition that was conducted by the California Geology Survey in October 2012.

The preliminary assessment of erosion hazard potential was made using the Erosion Hazard Rating (EHR) System presented in the Soil Conservation Guidelines/ Standards Off-Highway Vehicle Recreation Management (see Division, 1991) and soil survey data provided by the Natural Resources Conservation Service (see U.S. Department of Agriculture, Natural Resources Conservation Service, multiple dates).

The EHR assessment method is described in detail in the Soil Conservation Guidelines/Standards (Division, 1991), and was conducted based on general guidelines provided in the 2008 Soil Conservation Standard and Guidelines (Division, 2008). The method utilizes information about soil type, vegetation cover, slope, and precipitation to derive an EHR. The assessment for the site was using a model developed in ArcGIS.

The EHR method determines the relative risk of surficial erosion from runoff drainage on an existing soil-covered surface. It provides a first measure of erosion risk, enabling land managers to assess baseline soil erosion conditions, as well as to evaluate, design, and plan soil-disturbing activities so that erosion hazard risk is minimized.

The extent of the study area used for this EHR assessment includes 129 soil map unit categories within four soil map areas designated by NRCS; 54 of these soil units occur within the acquisition parcel boundaries. The NRCS-assigned soil unit names and ID numbers for the 54 soil units are provided in Table 1 (attached). Soil units that are present in more than one of the four NRCS soil map areas are listed separately in this table for each map area in which they occur. To calculate EHR, soil textures are assigned values which depend on the slope steepness.

Six-hour precipitation intensity, soil cover, and slope length are also factored into the EHR rating. The precipitation intensity value was based on data obtained from the weather station at the Randsberg Fire Station, approximately 20 miles east of the site. The Randsberg weather station has an elevation of 3560 feet above MSL, which falls within the study site's elevation range of approximately 2150 feet to 7500 feet.

Soil vegetative cover was assumed constant throughout the site. The assigned cover value was based on a mix of ground cover vegetation, exposed soil, and shrub and tree canopy.

The topography covering the site is variable, including gentle, moderate, and steep slopes. The majority of the site lacks significant organic debris such as logs and large branches that could act to disrupt surface-water flow. The slope length value was held constant in the ArcGIS model, which utilized a 10-meter digital elevation model (DEM) from the USGS National Elevation Dataset (Gesch, 2007) to illustrate the topography of the site and surroundings. To more accurately reflect the topography represented by the 10-meter DEM, the slope length range value used in the EHR assessment was based on slopes greater than 50 feet in length.

Other NRCS factors used in the EHR calculation include infiltration and permeability ratings and depth to restrictive layer (e.g., bedrock).

The results of the preliminary EHR assessment for the site are illustrated on the accompanying EHR map included with this memorandum. The assessment of erosion hazard potential resulted in the following distribution of erosion hazard rating categories within the parcel units: < 1% Very High, 18% High, 25% Moderate, and 57% Low. The areas of higher relief within the study area are primarily underlain by Mesozoic granitic rocks, Pre-Cenozoic granitic and metamorphic rocks, or Pre-Cretaceous metamorphic rocks. The steepest slopes in the study area also occur within these areas, and the soils in these locations appear to be the most susceptible to erosion as measured by the applied EHR method. Included among the more erodible soils are soil-rock outcrop complexes with 30 to 60 percent slopes and moderate to very high runoff ratings, such as soil units 253, 253ne, 254, and 516. The areas of lowest assessed erosion hazard potential appear to be predominantly located in areas with Quaternary alluvium, soils derived from Pleistocene non-marine units, or soils derived from granitic bedrock with very gentle slopes.

Phil Jenkins
December 17, 2012
Page 3 of 4

Respectfully submitted,

original signed by:

Pete Roffers
Engineering Geologist
California Geological Survey

Concur:

original signed by:

Will J. Harris, PG 5679, CEG 2222, CHg 750
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Table 1, attached.

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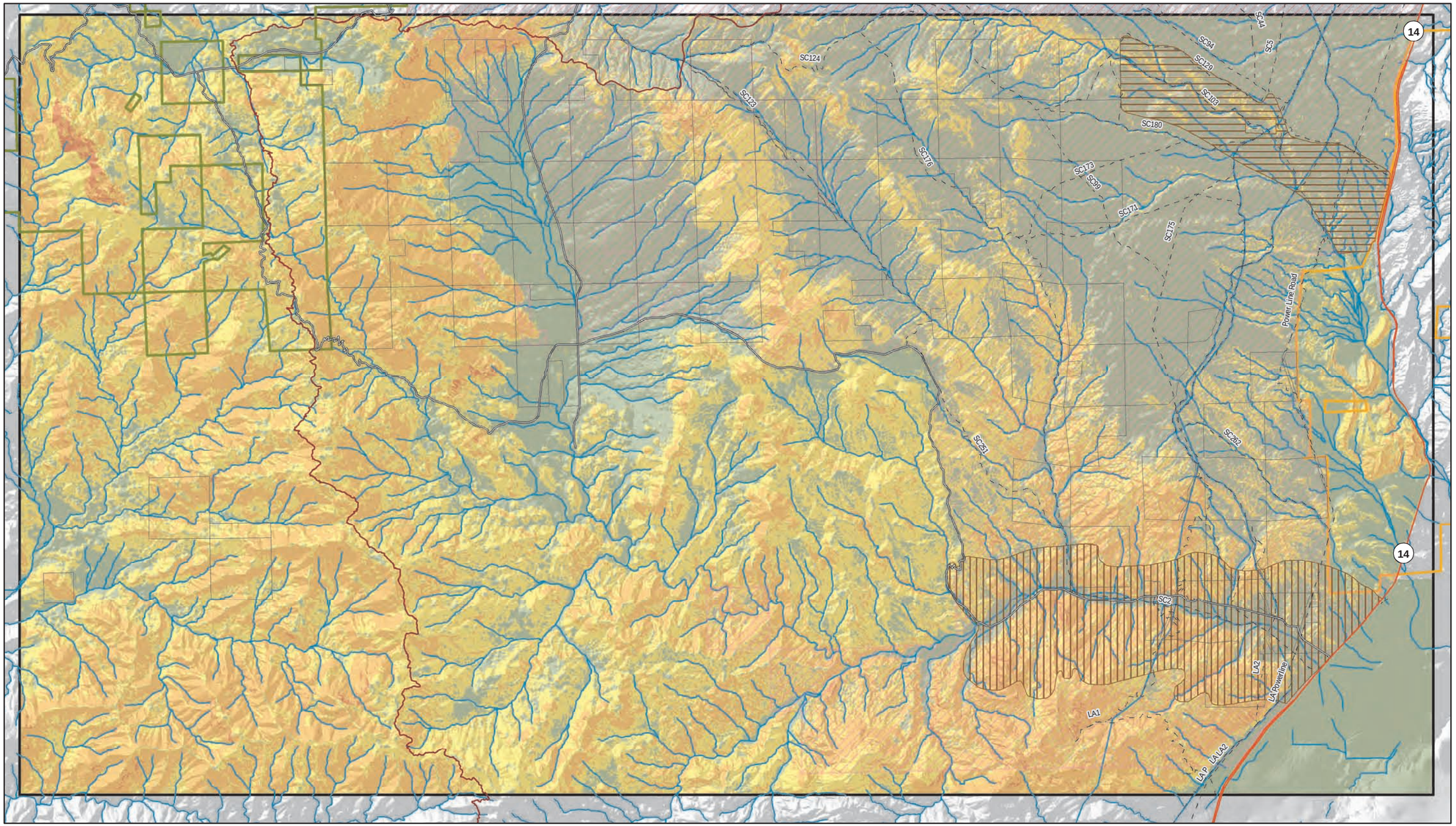
Table 1. The 54 soil units present within the parcels of the study area (from NRCS).

Map Area	MUSYM	MUKEY	Soil Unit Name
CA668	210	467327	Kernfork fine sandy loam, 0 to 2 percent slopes, occasionally flooded
CA668	216	467332	Inyo-Riverwash complex, 0 to 5 percent slopes, frequently flooded
CA668	222	467336	Kelval fine sandy loam, 0 to 2 percent slopes, occasionally flooded
CA668	223	467337	Kelval stony sandy loam, 0 to 2 percent slopes, occasionally flooded
CA668	224	467338	Inyo gravelly loamy coarse sand, 0 to 9 percent slopes, occasionally flooded
CA668	241	467341	Inyo gravelly loamy coarse sand, 0 to 5 percent slopes
CA668	242	467342	Inyo gravelly loamy coarse sand, 5 to 15 percent slopes
CA668	243	467343	Kernfork loam, saline-sodic, 0 to 2 percent slopes, occasionally flooded
CA668	245	467344	Chollawell gravelly loamy coarse sand, 2 to 5 percent slopes
CA668	246	467345	Chollawell gravelly loamy coarse sand, 5 to 15 percent slopes
CA668	247	467346	Inyo-Tips-Rock outcrop complex, 5 to 30 percent slopes
CA668	250	467348	Hoffman-Tips-Pilotwell association, 15 to 50 percent slopes
CA668	253	467349	Sorrell-Martee-Rock outcrop complex, 30 to 60 percent slopes
CA760	253ne	2371018	Sorrell-Martee-Rock outcrop complex, 30 to 60 percent slopes
CA668	254	467350	Martee-Rock outcrop complex, 30 to 60 percent slopes
CA668	264	467356	Arujo-Walong-Tunis association, 9 to 30 percent slopes
CA668	268	467360	Tunis-Tollhouse-Sorrell association, 30 to 75 percent slopes
CA668	270	467362	Locobill-Backcanyon-Sesame complex, 20 to 60 percent slopes
CA668	275	467367	Strahle-Sesame-Tweedy association, 30 to 75 percent slopes
CA668	288	467380	Sorrell-Arujo-Rock outcrop association, 9 to 50 percent slopes
CA760	306	465179	Monache variant, drained, warm-Junipero family association, gently sloping
CA668	330	467400	Kernville-Faycreek-Rock outcrop complex, 30 to 75 percent slopes
CA668	505	467407	Chollawell gravelly loamy coarse sand, 5 to 20 percent slopes
CA668	512	467412	Chollawell gravelly sandy loam, cobbly substratum, 5 to 15 percent slopes
CA668	514	467413	Chollawell-Inyo complex, 5 to 15 percent slopes
CA668	516	467415	Xyno-Rock outcrop-Canebrake association, 30 to 60 percent slopes
CA668	554	467430	Deerspring fine sandy loam, 0 to 5 percent slopes
CA760	554ne	2371543	Deerspring fine sandy loam, 0 to 5 percent slopes
CA668	561	467436	Scodie-Sacatar-Canebrake complex, 5 to 30 percent slopes
CA760	561ne	2371551	Scodie-Sacatar-Canebrake complex, 5 to 30 percent slopes
CA760	687	465262	Wind River family-Dome-Rock outcrop association, moderately steep
CA682	3010	1868302	Jawbone-Typic Haplargids-Rock outcrop association, 30 to 60 percent slopes
CA682	3250	1725746	Jawbone association, 30 to 60 percent slopes
CA670	3250ne	2218107	Jawbone association, 30 to 60 percent slopes
CA682	3251	1725747	Jawbone association, 8 to 50 percent slopes
CA682	3280	1868300	Typic Torriorthents-Rock outcrop association, 30 to 60 percent slopes
CA682	3301	1487080	Cutterbank association, 15 to 60 percent slopes
CA670	3301nm	2218111	Cutterbank association, 15 to 60 percent slopes
CA682	3630	1487079	Koehn coarse sand, 2 to 8 percent slopes
CA670	3630nm	2218113	Koehn coarse sand, 2 to 8 percent slopes

Table 1. The 54 soil units present within the parcels of the study area (from NRCS).

Map Area	MUSYM	MUKEY	Soil Unit Name
CA682	4160	1480620	Dovecanyon-Cutterbank association, 4 to 50 percent slopes
CA682	4161	1480621	Dovecanyon loamy sand, 2 to 8 percent slopes
CA682	4240	1860304	Chollawell gravelly sandy loam, 5 to 15 percent slopes
CA682	4241	1860305	Chollawell-Inyo complex, 5 to 15 percent slopes
CA682	4430	1600983	Koehn sand, 2 to 8 percent slopes
CA682	4432	1725748	Koehn association, 2 to 4 percent slopes
CA670	4432ne	2218108	Koehn association, 2 to 4 percent slopes
CA668	5201	1895801	Wingap-Pinyonpeak association, 8 to 30 percent slopes
CA682	5201	1480617	Wingap-Pinyonpeak association, 8 to 30 percent slopes
CA682	5210	1725750	Grandora-Pinyonpeak association, 8 to 60 percent slopes
CA682	6001	1480616	Goldpeak-Pinyonpeak-Wingap complex, 2 to 30 percent slopes
CA682	6002	1480619	Goldpeak gravelly loamy sand, 2 to 8 percent slopes
CA682	6601	1480618	Pinyonpeak-Wingap-Rock outcrop association, 8 to 30 percent slopes



Erosion Hazard Rating
Eastern Kern County Acquisition

January 2013

Erosion Hazard Rating

- very high
- high
- moderate
- low

- Trails
- Pacific Crest Trail
- State Hwy 14
- Roads
- Parcels
- Jawbone Open Area
- Dove Springs Open Area
- Red Rock Canyon State Park
- Sequoia National Forest
- ACEC Designation

Scale 1:100,000

0 0.5 1 2 3 4 Miles

0 0.5 1 2 3 4 Kilometers

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