APPENDIX E

BOTANICAL RESOURCES REPORT
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BOTANICAL RESOURCES REPORT

EASTERN KERN COUNTY ACQUISITION PROJECT

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Summary

Reconnaissance-level vegetation mapping and special-status plant surveys were carried out in March-May 2012 in the 28,275-acre Eastern Kern County Acquisition (EKCA) project area. The EKCA project area encompasses a considerable geographic and elevational range, although the geology is primarily granitic in origin. The most impressive physical features are the seeps, springs and wetlands arising in Kelso Valley from the watershed of Piute Mountain and in Alphie Canyon from the Jawbone Fault.

Vegetation resources. Eleven major vegetation types were mapped in the project area. The name, approximate acreage and percentage of total acreage of these vegetation types are presented below:

Major Vegetation Type	Acreage[1]	Percent
Barren, herb dominated, or very sparse shrubs	1,159.1	4.1%
Blackbrush scrub	5,262.3	18.6%
Creosote bush-white bursage scrub	3,689.3	13.1%
Desert wash and terrace scrub	1,801.6	6.4%
Developed	1.0	>0.1%
Wetland and riparian	362.7	1.3%
Lower Mojave mixed woody scrub	1,715.8	6.1%
Upper Mojave mixed woody scrub	2,197.9	7.8%
California juniper woodland	1,435.5	5.1%
Joshua tree woodland	7,735.9	27.4%
Oak forest and woodland	1,556.9	5.5%
Pine forest and woodland	1,336.6	4.7%
Total	28,254.6	100.0%

Within these major vegetation types, 51 vegetation types were identified and mapped. To the extent possible, these corresponded with Manual of California Vegetation alliances and, when extensively represented, sometimes associations. Sensitive vegetation types were defined as alliances ranked by the California Natural Diversity Database (CNDDB) as S3, and locally rare or unique vegetation types, such as wetland and riparian types.

Examples of sensitive riparian and wetland habitats included the following:

- A quarter-mile long reach of desert riparian and scrub vegetation along Dove Spring Canyon in Parcel D-2 in the Dove Spring area;
- A complex of nine seeps and springs with desert riparian and seep vegetation in Parcel A-5 in the Alphie Canyon area;
- Butterbredt Springs and an interrupted series of smaller meadow, seep and desert riparian habitats along Butterbredt Canyon in Parcels B-9 and B-10 in the Butterbredt area;
- Smaller seeps and springs, such as Water Canyon in Jawbone Canyon Parcel J-5; mesquite woodland on Sugarloaf Peak in Parcel S-5; and small seeps in tributary washes in Alphie Canyon Parcels A-4 and A-6;

[1] The acreage total presented here is derived from GIS mapping. This total is about 0.1% less than the total in the legal description, which may be due to different treatment for easements compared with fee title, and due to the exclusion of developed areas from the total presented here.

- Green Spring and associated marshes and springs, occupying several hundred acres in Kelso Valley Parcels K-13, K-17, and K-20;
- Perennial springs and streams on the western side of Kelso Valley, including Esperanza Canyon, Water Canyon, Cottonwood Creek, and other unnamed watercourses in Parcels K-8, K-9, K-12, K-15, and K-16.

Examples of other sensitive vegetation types included the following:

- Scalebroom desert wash scrub
- Blackstem rabbitbrush desert wash scrub
- Desert olive scrub
- California coffeeberry scrub
- Wright's buckwheat scrub
- Joshua tree woodland

Special-status plants. Special-status plants were defined as species listed as rare, threatened or endangered, or candidate for listing, by the California Department of Fish and Game or U.S. Fish and Wildlife Service, and species assigned a California Rare Plant Rank (CRPR) of 1 through 4 (equivalent to the California Native Plant Society rank). Out of 52 species initially considered on the basis of California Natural Diversity Database and California Native Plant Society queries, 39 species were considered to have at least moderate potential to occur within the survey area. Ten special-status species were observed or have been reported from the following EKCA parcels:

- Palmer's mariposa-lily (*Calochortus palmeri* var. *palmeri*; CRPR Rank 1B.2), Kelso Valley (Parcel K-9) and Landers Meadow (assumed to be parcels L-1 and L-2);
- Alkali mariposa-lily (*Calochortus striatus*; CRPR 1B.2), Kelso Valley (Parcel K-13);
- Mojave paintbrush (*Castilleja plagiotoma*; CRPR 4.3), Kelso Valley (Parcel K-13) and Landers Meadow (parcels L-1 and L-2);
- Death Valley sandmat (*Chamaesyce vallis-mortae*; CRPR 4.3), Sugarloaf (Parcel S-1), Dove Spring (Parcel D-4), Alphie Canyon (parcels A-4, A-6 and A-7), Butterbredt (parcels B-9 and B-10), and Kelso Valley (parcels K-1, K-2, K-4, K-13, K-16, K-17, and K-20);
- Mojave spineflower (*Chorizanthe spinosa*, CRPR 4.2), Sugarloaf (Parcel S-6);
- Desert cymopterus (*Cymopterus deserticola*; CRPR 1B.2), Alphie Canyon (Parcel A-3);
- Kelso Creek monkeyflower (*Mimulus shevockii*; CRPR 1B.2), Kelso Valley (parcels K-9 and K-14);
- Charlotte's phacelia (*Phacelia nashiana* ; CRPR 1B.2), Jawbone Canyon (Parcel J-3), and Alphie Canyon (Parcel A-5);
- Mojave fish hook cactus (*Sclerocactus polyancistrus*; CRPR 4.3), Alphie Canyon (Parcel A-5); and
- San Bernardino aster (*Symphyotrichum defoliatum*; CRPR 1B.2), Landers Meadow (assumed to be parcels L-1 and L-2)

Because of the low rainfall in 2011-2012, the large size of the EKCA acquisition, and the reconnaissance nature of the surveys, more intensive surveys would be required to determine the full extent of these and other special-status plants that may occur in the EKCA area. Such surveys are recommended as part of the development of the management plan for the EKCA project where soil or vegetation disturbance is anticipated.

1 Introduction and Purpose

The California Department of Parks and Recreation (CDPR), Off-Highway Motor Vehicle Recreation Division (OHMVR Division) is proposing to acquire from ReNu Resources, LLC. (ReNu) 59 parcels totaling 28,275 acres in eastern Kern County, California. This project is known as the Eastern Kern County Acquisition Project, or EKCA. This botanical resource report was prepared to support California Environmental Quality Act (CEQA) analysis of the impacts of acquisition of the EKCA parcels. The purpose of this report is to characterize the vegetation present in the project area, to assess the known and potential occurrence of special-status plants, and to identify sensitive vegetation types. Information on the observed nature and extent of human-caused disturbance in each parcel is also provided.

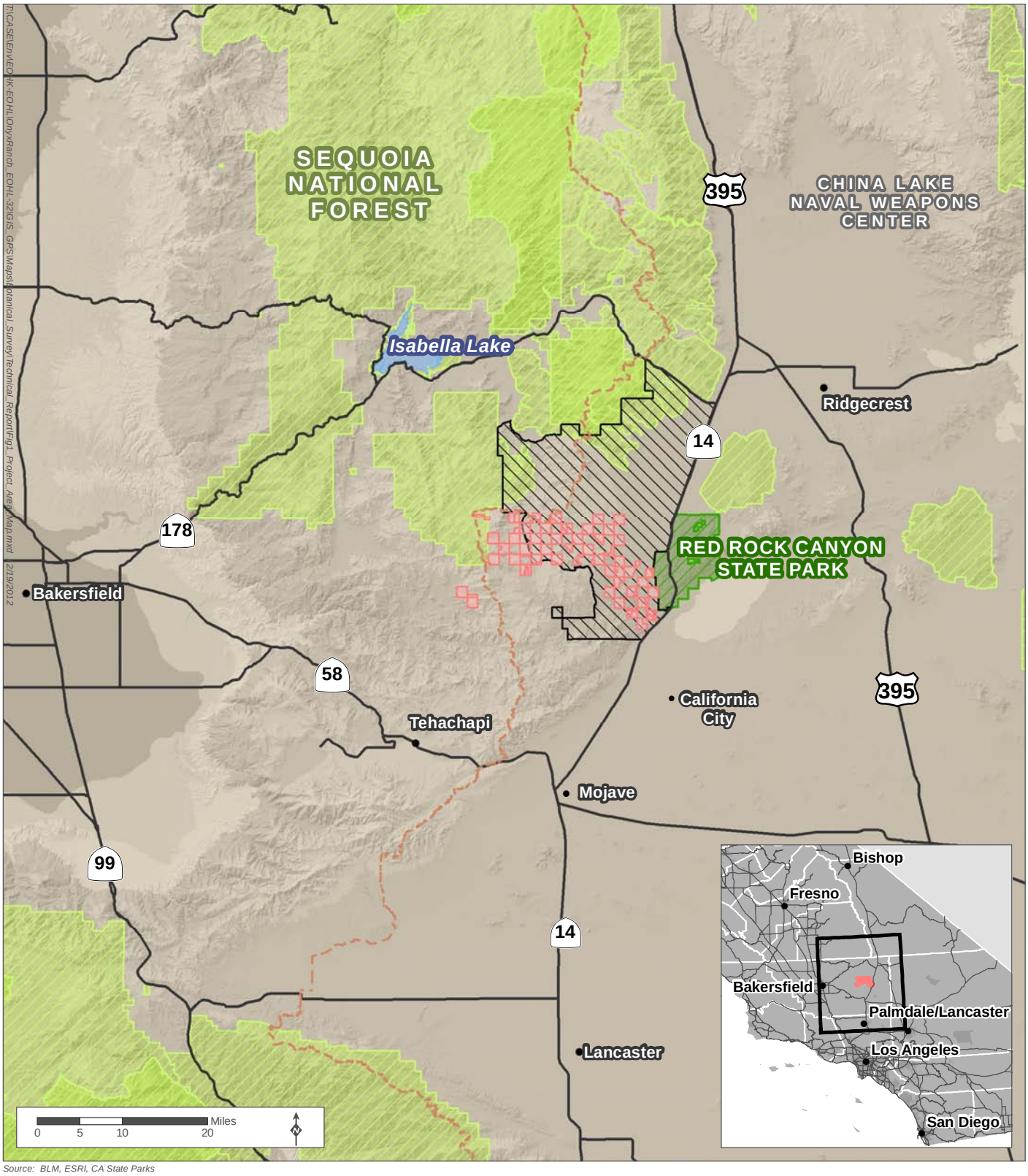
The Draft EIR will analyze only the physical environmental effects of the property purchase by the OHMVR Division, including any proposed short-term changes in land use and management to protect the natural and cultural resources on the acquired parcels. Should the OHMVR Division keep and become the management entity of some or all of the lands, a general plan would eventually be prepared for its properties, but a general plan is not part of the current EIR. Preparation and approval of a general plan would be an action separate from this project and would be subject to separate environmental review.

1.1 Location of Survey Area

The 59 parcels comprising the EKCA project area and the botanical resource survey area are located primarily in the northwestern Mojave Desert, southwest of Ridgecrest, California (see **Figure 1**). The area containing the parcels is generally bounded by Jawbone Canyon on the south, Highway 14 and Red Rock Canyon State Park on the east, Dove Spring Canyon on the north and Piute Mountain on the west. Elevations range from 2,170 feet above sea level at the mouth of Jawbone Canyon in the eastern part of the acquisition area to 7,700 feet on Sorrell Peak in the western part of the area. The area is located at the transition between the Mojave Desert and the eastern and southern slope of the Sierra Nevada. The vegetation communities are also influenced by proximity to the Great Basin.

The majority of the survey area is located within the Bureau of Land Management's (BLM) 211,000-acre Jawbone-Butterbredt Area of Critical Environmental Concern (ACEC; see Figure 1). The parcels are interspersed in a checkerboard pattern with parcels owned by the BLM and managed by its Ridgecrest Field Office. The parcels are within an area frequently referred to as the Onyx or Rudnick Ranch. Current uses include cattle ranching, off-highway vehicle use, and non-consumptive recreation.

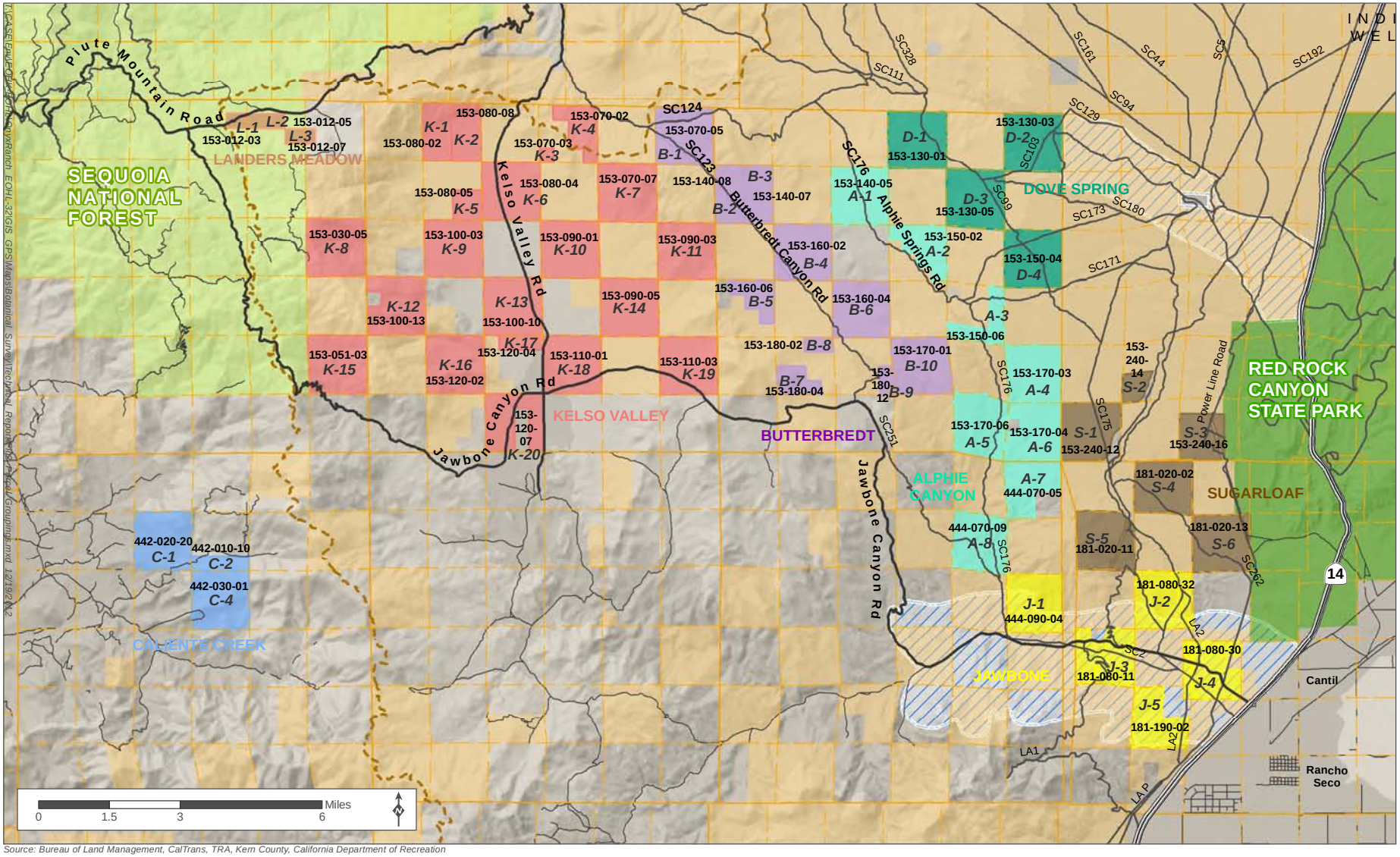
The lands are mostly undeveloped although there is an extensive system of dirt roads that passes through or near most of the parcels. There is fencing and limited water development used for cattle grazing. In addition to cattle grazing, portions of the acquisition area are regularly used for off-highway vehicle (OHV) recreation and camping, particularly in proximity to the Dove Springs Open Area in the north and Jawbone Canyon Open Area in the south. **Figure 2** shows these open areas with lighter shading and diagonal blue crosshatching. Open areas are designated areas where OHV use and camping may occur anywhere. Elsewhere, vehicle use is restricted to designated trails or roads. Some roads are for street-legal vehicles only, while some trails are designated for both street-legal vehicles and registered OHVs, known as "green sticker" vehicles. BLM discourages off-designated route travel but cannot enforce violations on private lands. In addition, BLM cannot repair or restore lands disturbed by OHVs on private lands. It is hoped that the acquisition of EKCA parcels by the CDPR OHMVR Division will facilitate more coordinated management in the Jawbone-Butterbredt ACEC.



Source: BLM, ESRI, CA State Parks

- Major Roads
- Pacific Crest Trail
- Jawbone/Butterbredt ACEC
- Project Parcels
- US Forest Service
- California State Parks

Figure 1 Project Location



Source: Bureau of Land Management, CalTrans, TRA, Kern County, California Department of Recreation

State Route
Local Roads
Other Local Roads
4WD & OHV Designated Routes
Pacific Crest Trail (USFS 2008)
Open Riding Area

California State Parks
Bureau of Land Management
US Forest Service
Public Lands Sections

Project Parcel Groupings*
Grouping
Alphie Canyon
Butterbredt
Caliente Creek
Dove Spring
Jawbone
Kelso Valley
Landers Meadow
Sugarloaf

** Labeled by APN and Parcel ID Code*

Figure 2 Parcel Goupings, Parcel Codes and APNs

A total of 33 parcels are within the green sticker travel area (areas where registered OHVs are allowed); the area containing these parcels is termed the eastern acquisition area. Twenty-six parcels are closed to green sticker vehicles, although street legal vehicles are allowed on designated roads; the area containing these parcels is termed the western acquisition area.

For purposes of describing the botanical resources, the eastern and western acquisition areas were further divided into smaller groups, mostly based on watershed boundaries. **Table 1** presents the parcel groups, parcel codes, assessor's parcel number, acreage, identified habitat features, and the status of existing roads and trails. They are presented in a sequence beginning with the eastern acquisition area. The eastern acquisition area includes the Jawbone Canyon, Sugarloaf, Dove Spring, Alphie Canyon, and Butterbredt parcel groups. The western acquisition area includes the Kelso Valley, Landers Meadow and Caliente Creek parcel groups. Figure 2 shows the location of each parcel and parcel group.

Table 1. Parcel group, parcel code, assessor's parcel number, acreage, special habitat features, and status of existing roads and trails in the botanical survey area.

Parcel Code	APN	Acreage	Identified Habitat Features	Status of Designated Roads and Trails*
EASTERN ACQUISITION AREA				
Jawbone Canyon Parcel Group (Cinco 7.5' quadrangle)				
J-1	444-090-04	640	Wash	-- (G, O)
J-2	181-080-32	614	Wash	LA1, LA2 (G, O)
J-3	181-080-11	582	Wash, spring	Jawbone Canyon Rd., LA1 (O)
J-4	181-080-30	550	Wash	Jawbone Canyon Rd., LA2, LA Power Line Rd. (O)
J-5	181-190-02	480	Water Canyon, spring	-- (O)
Sugarloaf Parcel Group (Cinco and Dove Spring 7.5' quadrangles)				
S-1	153-240-12	617	Wash	LA2, SC 175 (G)
S-2	153-240-14	127	Wash	LA2 (G)
S-3	153-240-16	327	Wash	LA Power Line Rd (G)
S-4	181-020-02	612	Wash	SC 162 (G)
S-5	181-020-11	613	Wash	LA1, LA2 (G)
S-6	181-020-13	622	Springs	SC 162 (G)
Dove Spring Parcel Group (Dove Spring 7.5' quadrangle)				
D-1	153-130-01	640	Wash	SC 103 (G)
D-2	153-130-03	640	Springs	SC103 (G)
D-3	153-130-05	640	Wash	SC 99, 103, 180 (G)
D-4	153-150-04	640	Wash	SC 99, 173 (G)
Alphie Canyon Parcel Group (Pinyon Mountain, Dove Spring and Cinco 7.5' quadrangles)				
A-1	153-140-05	640	Wash	Alphie Springs Road (SC 176) (G)
A-2	153-150-02	400	Wash	Unmaintained roads (G)
A-3	153-150-06	280	Wash	Alphie Springs Rd. (SC 176), SC 171 (G)
A-4	153-170-03	640	Springs	Unmaintained roads (G)
A-5	153-170-06	640	Springs	Alphie Springs Rd. (SC 176) (G)
A-6	153-170-04	600	Springs	Unmaintained roads (G)
A-7	444-070-05	477	Wash	-- (G)
A-8	444-070-09	640	Wash	Butterbredt Cyn Rd. (SC 176), SC 251 (G)
Butterbredt Parcel Group Pinyon Mountain and Dove Spring 7.5' quadrangles)				
B-1	153-070-05	632	Wash	Butterbredt Canyon Rd. (SC 123), Gold Peak Rd. (SC 124) (G)
B-2	153-140-08	317	Wash	Butterbredt Canyon Rd. (SC 123) (G)
B-3	153-140-07	320	Wash	Butterbredt Canyon Rd. (SC 123) (G)
B-4	153-160-02	636	Wash	Butterbredt Canyon Rd. (SC 123) (G)
B-5	153-160-06	323	Wash	-- (G)
B-6	153-160-04	639	Wash	Butterbredt Canyon Rd. (SC 123) (G)
B-7	153-180-04	200	Wash	Unmaintained roads (G)
B-8	153-180-02	80	Wash	-- (G)

B-9	153-180-12	80	Springs	Butterbredt Canyon Rd. (SC 123) (G)
B-10	153-170-01	640	Wash	Unmaintained roads (G)
WESTERN ACQUISITION PARCELS				
Kelso Valley Parcel Group Pinyon Mountain, Claraville and Cross Mountain 7.5' quadrangles)				
K-1	153-080-02	320	Springs	Private roads (S)
K-2	153-080-08	322	Springs	Private roads (S)
K-3	153-070-03	40	Wash	--
K-4	153-070-02	321		Butterbredt Canyon Rd. (SC 123) (G), Pacific Crest Trail (H)
K-5	153-080-05	160	Wash	Private roads (S)
K-6	153-080-04	640	Wash	Kelso Valley Rd. (S)
K-7	153-070-07	640	Wash	-- (S)
K-8	153-030-05	640	Water, Esperanza Canyons; Sorrell Peak	Unmaintained roads (N)
K-9	153-100-03	640	Esperanza Canyon, Water Canyon	Private roads (S)
K-10	153-090-01	640	Wash	Private roads (S)
K-11	153-090-03	640	Wash	-- (S)
K-12	153-100-13	603	Springs	Private roads (S)
K-13	153-100-10	640	Green Spring	Kelso Valley Rd. (S)
K-14	153-090-05	640	Wash	Private roads (S)
K-15	153-051-03	634	Cottonwood Creek	Jawbone Canyon Rd. (S)
K-16	153-120-02	640	Springs	Private roads (S)
K-17	153-120-04	120	Wash, springs	-- (S)
K-18	153-110-01	632	Wash	Jawbone Cyn Rd., Kelso Valley Rd. (S)
K-19	153-110-03	634	Wash	Jawbone Canyon Rd. (S)
K-20	153-120-07	513	Springs	Jawbone Canyon Rd. (S)
Landers Meadow Parcel Group (Claraville 7.5' quadrangle)				
L-1	153-012-03	123	Meadow	Piute Mountain Rd. (S)
L-2	153-012-05	41	Meadow	-- (N)
L-3	153-012-07	81	--	-- (N)
Caliente Creek Parcel Group (Emerald Mountain 7.5' quadrangle)				
C-1	442-020-20	640	Hugh Mann Canyon	Private roads (N)
C-2	442-010-10	160	Hugh Mann Canyon	Private roads (N)
C-3	(deleted)			
C-4	442-030-01	640	Caliente Creek	Weller Road (N)
Total		28,275 acres		

*Road and trail designations: H=hiking only; S=street-legal vehicles on identified, maintained roads only; G=green sticker and street-legal vehicles allowed on identified roads only; O=within or partially within BLM-designated open area; N=unpaved roads present, but no usage designated. Parcels may contain more than one designation.
Sources: Friends of Jawbone (2011); Trailsource.com (2012).

1.2 Setting

1.2.1 Climate

Most of the project area is situated on the east side of the Piute Mountains, and therefore lies in a rain shadow. Precipitation in the project area generally falls during the winter months. Rain is predominant at the lower elevations, but a substantial proportion falls as snow at the higher elevations. Total annual precipitation ranges from 6 inches or less at the eastern, lower elevations of the project area, to 12 or 13 inches at the higher elevations in the Piute Mountains (Western Region Climate Center, 2012; DWR, 2003).

1.2.2 Geology and Soils

The survey area lies at the boundary between two geologic provinces, the Sierra Nevada and the Mojave Desert (Twisselmann, 1995). The Sierra Nevada formed as large granitic batholiths during the Mesozoic era 90 to 120 million years ago, was uplifted to become mountainous terrain, and began the process of erosion that continues today. Piute Mountain forms the southernmost range of the Sierra Nevada. Although most of the rock comprising Piute Mountain is granitic, metamorphic rocks are also present where the intruding batholith contacted surrounding rock. Blue Point, near the intersection of Jawbone Canyon Road and Alphie Canyon Road, is the most prominent example of a metamorphic rock outcrop in the general area.

Piute Mountain is relatively steep on its eastern slope where it descends into Kelso Valley. Terrain then drops through a series of lower mountains (Butterbredt Peak, Gold Peak, Dove Peak) and valleys (Butterbredt Canyon, Alphie Canyon, Jawbone Canyon) toward Fremont Valley. The Jawbone Fault passes more or less through Alphie Canyon in the survey area. The Sierra Nevada geologic formation—and hence Sierra Nevada province—ends at the Sierra Nevada Fault Zone, which passes through Jawbone Canyon slightly west of Poleline Canyon (Smith, 1964). To the east of the fault zone are Pliocene lakebed formations and alluvial fans.

Most of the soils in the project area are granitic in origin (U.S. Dept. Agriculture National Resource Conservation Service (USDA NRCS), 2007, 2008a, 2008b, 2009). The uplands in the Jawbone Canyon, Alphie Canyon, Butterbredt, Kelso Valley, and Landers Meadow areas are generally granite or granitoid (i.e., similar to granite but varying in texture and composition), and the soils formed over these uplands are generally thin and coarse-textured. The fans at the bases of the uplands consist of accumulated alluvium of increasing depth; the soils are deeper in the fans, although often still coarse. The valley floors and broad canyon mouths contain finer-textured soils. Some, in Landers Meadow and the southern portion of Kelso Valley, are fine-textured sandy loams formed in wetlands and floodplains. Some in the lowest part of Kelso Valley are saline-alkaline.

The soils in the Dove Spring and eastern Alphie Canyon and Sugarloaf areas contain older alluvial fans where soils are more fully developed and the topography consists of broad gentle slopes and dissected bajadas. Older alluvial fans are also present on the eastern side of Kelso Valley. Still farther east, and primarily in the gently sloping terrain of the eastern Sugarloaf parcels, are still finer-textured somewhat calcareous fine sandy loams formed over Pliocene lakebeds formed from highly weathered granite alluvium.

Metamorphic soils are of interest in the survey of special-status plants, because they may contain unusual combinations of minerals. Metamorphic soils are relatively uncommon in the survey

area, but several areas are noted as potentially containing them. Most of the Caliente Creek parcels (C-1, C-2 and C-4) contain soils reported as forming from granitoid rock (igneous), gneiss (a metamorphic rock formed from granite), or metamorphic rock (USDA NRCS, 2007). In addition, the geologic map for the region (Smith, 1964) shows a metamorphic rock formation extending along the western side of Alphie Canyon in the survey area. Even though the soil surveys do not indicate the presence of soils formed from metamorphic rock, some areas of distinctive soils could be present, especially in the western portions of Parcels A-4 and A-5 and the southeastern portion of nearby Parcel B-10.

1.2.3 Hydrology (Watersheds and Drainages)

Most of the project area is within the Fremont Valley Groundwater Basin, a closed basin 523 square miles in area that drains mainly into Koehn Dry Lake, to the east of Jawbone Canyon (DWR, 2003). The main drainages in the project area are Jawbone Canyon (and its tributaries, including Water Canyon, Alphie Canyon, Poleline Canyon, Butterbredt Canyon, and Hoffman Canyon); and Red Rock Canyon (and its tributaries, including Dove Spring Canyon).

To the west and upslope from the Fremont Valley Basin proper is the Kelso Lander Valley Groundwater Basin. This basin lies at the foot of Piute Mountain and is only 17 square miles in area (DWR, 2003). Kelso Valley has a number of seeps and springs on its western edge at the foot of Piute Mountain. Water flows for varying distances into Kelso Valley, then disappears into the sandy and gravelly alluvium that characterizes the valley floor, reappearing at Green Springs and extensive meadows at the southern end of Kelso Valley. Groundwater then drains southward toward Cottonwood Creek, which flows south and eastward through Jawbone Canyon toward Fremont Valley. Landers Valley, which is higher in Piute Mountain, has a network of small drainages, none of which sustain surface flow into Kelso Valley and in fact appear to drain toward Kelso Creek, a tributary of the South Fork Kern River. The South Fork Kern River is a sub-basin of the Tulare Lake Hydrologic Region, a vast (17,000 square miles) area containing the southern San Joaquin Valley and tributaries from the Sierra Nevada, southern Tehachapis, and Coast Ranges. Portions of Parcels B-1 and K-4 in the northern portion of the Kelso Valley and Butterbredt areas also drain toward Kelso Creek.

The Caliente Creek parcels are also located in the Tulare Lake Hydrologic Region. Caliente Creek drains a small portion of western Piute Mountain. Caliente Creek empties into Walker Creek near Arvin, on the eastern San Joaquin Valley floor. From this point most flow moves as groundwater toward the Kern River and the Tulare Basin (DWR, 2003).

2 Study Methods

2.1 Definitions

Special-status plant is defined as a species meeting one or more of the following criteria:

- Listed or proposed for listing as threatened or endangered under the Endangered Species Act (ESA) or candidate for possible future listing as threatened or endangered under ESA (50 CFR Sec. 17.12)
- Listed or candidates for listing by the State of California as threatened or endangered under the California Endangered Species Act (CESA; Fish and Game Code Sec. 2050 et seq.).
- Listed as rare under the California Native Plant Protection Act (Fish and Game Code Sec. 1900 et seq.).
- Meets the definition of rare or endangered under the California Environmental Quality Act (Sec. 15380 (b) and (d). Species that may meet the definition of rare or endangered include the following:
    - Species considered by the California Rare Plant Rank (CRPR) to be "rare, threatened or endangered in California" (Ranks 1A, 1B, and 2; CNPS, 2012)
    - Species that may warrant consideration on the basis of local significance or recent biological information[2]
    - Some species included on the California Natural Diversity Database (CNDDB) Special Plants, Bryophytes, and Lichens List (California Department of Fish and Game, 2012a)
- Considered a locally significant species; that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region. An example could include a species at the outer limits of its known range or a species occurring on an uncommon soil type. In general, CRPR 3 and 4 species were considered locally significant for the purposes of this report
- Designated by the Bureau of Land Management (BLM) Ridgecrest or Bakersfield Field Office as a "special-status" plant (BLM, 2011)

Vegetation type is defined as a distinctive mapping unit. Whenever possible, vegetation types correspond to alliances or associations described in the second edition of *A Manual of California Vegetation* (MCV2; Sawyer et al., 2009). In some cases, distinctive mapping units not described in MCV2 were defined and mapped in this study.

Sensitive vegetation type is a mapping unit that is of limited distribution statewide or regionally. In general, MCV2 vegetation alliances ranked as G3 or S3 were considered sensitive vegetation types in this study. Vegetation types were also considered sensitive if they were unusually high in species richness or were known or likely to support special-status plants, even if they were not recognized in MCV2. Most types of wetlands and riparian communities are considered by the California Department of Fish and Game (CDFG) to be sensitive due to their limited distribution in California, and are included in this definition for this study.

[2] In general, CRPR 3 and 4 plants may not warrant consideration under CEQA. To be inclusive they are included here under the definition of special-status plants.

2.2 Review of Existing Information

Prior to initiating field surveys, available information was collected and reviewed to determine the resources with potential to occur in the survey area. The definitions of vegetation types were reviewed and a list of potentially-occurring vegetation types was compiled. Inquiries were made regarding mapping for the Mojave Desert Renewable Energy Conservation Plan (MDRECP), which slightly overlapped with the project area, but mapping information was not available until after completion of field surveys. CALVEG information (U.S. Forest Service, 2012) was also obtained and reviewed for the project area. CALVEG was relied upon for describing the Caliente Creek parcels, which were not field-accessed for this study.

For special-status plants, a list of species considered was compiled based on three primary sources: a CNDDB Rarefind query of the six U.S. Geological Survey 7.5-minute quadrangles on which the project is located—Cinco, Claraville, Cross Mountain, Dove Spring, Emerald Mountain, and Pinyon Mountain—as well as the 14 quadrangles surrounding them (CDFG, 2012b); a query of the California Native Plant Society (CNPS) Electronic Inventory for the same quadrangles (CNPS, 2012); and a review of a recent, nearby botanical survey for the North Sky River Wind Farm (Garcia and Associates, 2010). A list of 52 species was developed from these sources (see **Appendix A**).

From this list of species considered, a list was developed of species with potential to occur, based on the following. Species were considered to have potential to occur if they occurred within the geographic (within approximately 5 miles of the survey area) and elevation range of the survey area (2000-8000 ft) in the following broad habitat types: Mojavean Desert Scrub, Chenopod Scrub, Chaparral, Valley and Foothill Grassland, Marshes and Swamps, Riparian Forest, Riparian Scrub, Cismontane Woodland, Pinyon and Juniper Woodland, Joshua Tree Woodland, Lower and Upper Montane Coniferous Forest. Thirteen species not meeting these criteria were considered "unlikely to occur" and were given no further consideration. For those remaining 39 species, further information was developed on the distribution, habitat features, flowering period and other ecological information by reviewing collection records from the Consortium of California Herbaria (CCH, 2012) and the CalFlora database (CalFlora, 2012).

Prior to field surveys, BLM Ridgecrest Field Office biologists Glenn Harris and Shelly Ellis were contacted regarding species occurrences and sensitive habitat localities. Both knowledgeable individuals provided helpful information about known and potential occurrences of special-status plants in the project area and on the location of reference populations nearby.

In addition to compiling a table of species with potential to occur, we prepared a profile of each species with potential to occur, including a description, photograph, habitat and distribution information. These were provided to all field survey crew members.

2.3 Field Surveys

Field surveys were designed to be at the level of habitat assessment (rather than floristic or protocol) because of the large area of the project, the relative inaccessibility of many parcels, and anticipated limited impact of the acquisition project. The conditions of relative drought in 2012 reinforced this approach, because the detection of many herbaceous species was problematic.

Visits to reference populations were an important part of the field surveys because the abundance and phenological timing of many plant species varies from year to year, particularly when

precipitation is low or sporadic. Visits to reference populations were carried out at the beginning of each survey period in order to focus the surveys and plan for the next survey period.

2.3.1 Timing of Surveys

On March 13-15, 2012, Barbara M. Leitner and TRA biologist Sara Jones carried out a preliminary visit to the project area out to review site conditions, plant phenology, and check reference populations. On April 1-8, a crew of six biologists, including TRA biologists Tay Peterson and Megan Kalyankar, and consulting biologists Neal Kramer, Diane Renshaw, Denise LaBerteaux and Barbara M. Leitner carried out surveys on most of the eastern acquisition parcels. On May 6-12, 2012, Victoria Harris, Neal Kramer, Denise LaBerteaux, Mike Wood and Barbara M. Leitner re-visited some of the eastern acquisition area parcels and visited most of the parcels in Kelso Valley and Landers Meadow. On July 29, 2012, Denise LaBerteaux re-visited the Landers Meadow parcels.

2.3.2 Visits to Reference Populations

To train field crews on the appearance of special-status plants and to ascertain the phenological development of these plants to optimize survey efforts, we visited reference populations of several special-status plants known from the vicinity of the project area.

Shevock's onion (*Allium shevockii*): A CNDDB (Occ. 7) population of Shevock's onion is located in a side canyon of Jawbone Canyon. This canyon has conspicuously dark metamorphic rock formations (G. Harris, pers. comm., March 2012). In March 2012 a small colony of *Allium* was detected in clay pockets in rock outcrops there; the leaves had the characteristic onion odor and linear, terete (round in cross-section) form. The leaves already showed signs of herbivory in March and could not be relocated in May.

Alkali mariposa lily (*Calochortus striatus*): The CNDDB Occurrence 35 for alkali mariposa lily in Green Springs, Kelso Valley, was visited in March, April and May, 2012. It was hoped that this relatively large and extensive population would give some indication of the phenology of this species. However, no plants were observed during any of the site visits. A second site was visited, CNDDB Occurrence 36, south of Red Rock Canyon State Recreation Area in May. This site was a small and very well-defined area of alkaline seep and meadow. No alkali mariposa was found during a thorough search of suitable habitat there.

Red Rock tarplant (*Deinandra arida*): Populations in Red Rock Canyon were visited in April and May, 2012. Very few plants were observed during both visits; plants were observed in early flower in May. In addition, three Red Rock tarplants were observed at the alkali mariposa lily Occurrence 36 site to the southwest; this apparently was a previously-unreported sighting.

Mojave tarplant (*Deinandra mohavensis*): A CNDDB (Occ. 32) population of this plant is located in a side canyon of Jawbone Canyon, more or less south of Blue Point. This population was visited in March and again in May, 2012. No sign of Mojave tarplant was observed on either occasion.

Red Rock poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*): BLM biologist Glenn Harris provided a detailed map of a large population of Red Rock poppy in Mesquite Canyon in the El Paso Mountains (CNDDB occs. 6 and 7). This area was visited in March, April and May, 2012, but no sign of any poppy species was observed.

Charlotte's phacelia (*Phacelia nashiana*): CNDDB has two records in and near the project area, both in Jawbone Canyon (CNDDB Occurrences 16 and 49). These sites were visited in March,

April and May 2012. No plants were observed at either site. Overall herbaceous growth was very limited and spring annuals were generally sparse.

2.3.3 Vegetation Classification and Mapping

Vegetation mapping was done using 1:9,000 scale aerial photographs. For vegetation types not recognized as sensitive (special-status), the minimum mapping unit was generally taken as 20 acres, although sometimes smaller units were mapped for vegetation types very different from surrounding vegetation. Reference was made to the "membership criteria" described in MCV2 to determine if a mapping unit fit the description of a vegetation alliance. Sometimes vegetation fit a known vegetation association within an alliance; and if so, this type was mapped if possible. For Joshua Tree Woodland, the predominant understory (i.e., shrub) species was mapped as well. Sensitive vegetation types were mapped when they were encountered, regardless of size.

2.3.4 Special-status Plant Surveys

A list of plant species observed was developed for each parcel. The location of any special-status plants was recorded using a GPS unit, and a CNPS rare plant survey form was prepared. Areas of potentially suitable habitat for any special-status plants were noted and mapped.

2.3.5 Observed Disturbance

Several types of disturbance affect the condition of vegetation. Livestock grazing, wildfire, development, and off-highway vehicle use often affect vegetation in the western Mojave Desert. Invasive weeds[3] often increase after other types of vegetation disturbance. Incidental observations were made of vegetation disturbance in survey parcels, with the following limitation: Several invasive weeds are abundant and widespread in the project area—cheatgrass *(Bromus tectorum*), red brome (*B. madritensis* ssp. *rubens*), Mediterranean grass *(Schismus arabicus* and *S. barbatus*), and redstem filaree (*Erodium cicutarium*). No special note was taken of these species, but other invasive plants were noted as encountered, especially Saharan mustard *(Brassica tournefortii*) and tamarisk (*Tamarix* spp.).

2.4 Survey Limitations

Precipitation from the two nearest National Oceanic and Atmospheric Administration (NOAA) stations with complete records for the 2012 water year indicate that rainfall was well below normal (38% of normal at Palmdale and 44% of normal at Haiwee Reservoir; NOAA, 2012). Rain was also late: at Palmdale, precipitation from October 1, 2011 through February 29, 2012 totaled about 1 inch. Then about 1.25 inches fell in March and April. The total for the rainfall year was 2.73 inches compared to the normal total of 7.2 inches. The low total rainfall and relatively late rainfall meant that annual vegetation growth was extremely limited in 2012, therefore limiting the detection of many herbaceous plants, including, potentially, special-status species.

[3] An invasive weed is a non-native plant that is included on the lists maintained by the California Department of Food and Agriculture (CDFA, 2010) or the California Invasive Plant Council (Cal-IPC, 2006).

3 Results

3.1 Vegetation Types

The EKCA survey area encompasses a considerable range of physical conditions. The survey area extends 11 miles north to south and 21 miles from east to west, on both sides of the Sierra Nevada crest. Within the survey area, elevations range from 2,170 feet at the mouth of Jawbone Canyon to 7,700 feet at Sorrell Peak. Rainfall varies from an estimated average of 6 inches in Jawbone Canyon to an estimated 13 inches at Sorrell Peak and Landers Meadow. Vegetation ranges from extensive desert washes and arid scrub to live oak woodland, Jeffrey pine forest, and Joshua tree woodland. More than 400 plant taxa were observed during field surveys in 2012 (see **Appendix B and C**, Plant Species Observed during 2012 Surveys, eastern and western parcels, respectively). More intensive surveys during a favorable rainfall year would increase the number and frequency of plant taxa observed.

Fifty-one vegetation types were identified and mapped in the EKCA survey area. Vegetation types corresponded to Manual of California Vegetation alliances and associations, where possible (Sawyer et al., 2009). In the discussion that follows, the vegetation type and associated MCV2 vegetation alliance or association are noted together. For the purposes of this discussion, vegetation types are presented in related groupings, such as wetland and riparian; creosote bush scrub; and Joshua tree woodland. **Table 2** presents the vegetation types observed, by parcel, in the EKCA survey area. **Appendix D** presents vegetation maps of the parcels.

3.1.1 Barren, Herb-dominated or Very Sparse Shrub Types

Barren

This vegetation type has very low cover but fine-textured soil that may be high in clay or alkalinity. White bursage (*Ambrosia dumosa*) is the most common woody species. In 2012, a very dry year, the species richness of annuals was limited, but the special-status species Mojave spineflower (*Chorizanthe spinosa*; CRPR 4.2) was detected in this vegetation type.

In the survey area, barren areas mapped in the Jawbone and Sugarloaf areas (Parcels J-3, J-4, J-5, S-3 and S-6) were associated with Cutterbank soils, lakebed soils formed from granite alluvium. Their surface was gravelly with a fine-textured and possibly somewhat calcareous matrix. Although reported to be only moderately high in clay, these soils may have some associated alkalinity or other chemical property that results in their low productivity for plants. Barren areas were also noted in the Alphie Springs area (Parcels A-4, A-5, and A-8). Here, the barren areas may be associated with metamorphic substrate; blue rock formations similar to those at Blue Point were observed in the western canyon in Parcel A-4.

Rock Outcrop

This vegetation type was used to describe upland areas with rocky substrate and low plant cover. It was mapped in several parcels with extensive rocky areas: in the Jawbone Canyon area, Parcel J-1; in the Sugarloaf area, Parcel S-5; in Kelso Valley, Parcels K-9 and K-16. Smaller areas of rock outcrop were common throughout the survey area.

Table 2. Vegetation types observed, by parcel, Eastern Kern County Acquisition survey area																																						
EASTERN PARCELS	Parcel Group		JAWBONE CANYON					SUGARLOAF						DOVE SPRING				ALPHIE CANYON								BUTTERBREDT													
	Parcel Code		J-01	J-02	J-03	J-04	J-05	S-01	S-02	S-03	S-04	S-05	S-06	D-01	D-02	D-03	D-04	A-01	A-02	A-03	A-04	A-05	A-06	A-07	A-08	B-01	B-02	B-03	B-04	B-05	B-06	B-07	B-08	B-09	B-10			
Notes: ***Bold italics:*** sensitive vegetation type; (Parentheses): vegetation type present but too small to map	APN NO.		444-090-04	181-080-32	181-080-11	181-080-30	181-190-02	153-240-12	153-240-14	153-240-16	181-020-02	181-020-11	181-020-13	153-130-01	153-130-03	153-130-05	153-150-04	153-140-05	153-150-02	153-150-06	153-170-03	153-170-06	153-170-04	444-070-05	444-070-09	153-070-05	153-140-08	153-140-07	153-160-02	153-160-06	153-160-04	153-180-04	153-180-02	153-180-12	153-170-01			
VEGETATION TYPE	Rarity Rank	Acreage																																				
Barren, Herb-dominated or Very Sparse Shrubs																																						
Barren					X	X	X			X			X								X	X			X													
Rock Outcrop			X									X																										
Annual Grassland														X																								
Developed						X																																
Blackbrush Scrub Vegetation Types																																						
Blackbrush Scrub	G5S4		X		X		X	X						X	X	X		X		X	X	X	X	X	X		X		X	X	X	X	X	X	X			
Blackbrush-Creosote Bush Scrub								X	X													X	X															
Creosote Bush-White Bursage Scrub Vegetation Types																																						
Creosote Bush Scrub	G5S5		X		X	X		X			X		X									X	X		X													
Creosote Bush-White Bursage Scrub	G5S5		X	X	X	X	X			X	X	X	X								X	X	X	X	X													
Creosote Bush-Desert Senna Scrub													X																									
White Bursage Scrub	G5S4			X	X		X			X			X												X													
Desert Wash Vegetation Types																																						
Cheesebush Scrub	G5S4		X	X			X					X			X																							
Allscale Scrub	G5S4		X	X	X	X																X			X													
Desert Wash			X	(X)	(X)	X	X	X	X	X	X	X	X	(X)	(X)	(X)	(X)	X	X	X	X	X	X	X	X	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	X			
Rubber Rabbitbrush Scrub	G5S5					X																														X	X		
Wetland and Riparian Vegetation Types																																						
Blackstem Rabbitbrush Scrub	G4S3			X																																		
California Coffeeberry Scrub	G4S4																																						
Desert Olive Scrub	G3S2.2																																						
Desert Riparian Forest and Scrub	G4S4										X		X		X																					X	X		
Meadow and Seep					X		X								X							X	X												X	X		
Mesquite Scrub	G5S3.2											X																											
Pond																																				X		
Scalebroom Scrub	G3S3				X	X	X								X																							
Lower Mojave Mixed Woody Scrub			X		X					X		X			X							X	X	X	X	X							X					
Upper Mojave Mixed Woody Scrub Vegetation Types																																						
Big Sage Scrub	G5S5																																						
California Buckwheat Scrub	G5S5									X																X	X							X					
Nevada Ephedra Scrub	G4S4.3				X																																		
Spiny Hopsage Scrub	G5S3.3				X																																		
Upper Mojave Mixed Woody Scrub															X																								
Wedgeleaf Ceanothus Scrub	G4S4																																						
Wright's Buckwheat Scrub	G3S3																																						

Table 2. (contd.)																																		
EASTERN PARCELS (contd.)	Parcel Group		JAWBONE CANYON					SUGARLOAF						DOVE SPRING				ALPHIE CANYON								BUTTERBREDT								
	Parcel Code		J-01	J-02	J-03	J-04	J-05	S-01	S-02	S-03	S-04	S-05	S-06	D-01	D-02	D-03	D-04	A-01	A-02	A-03	A-04	A-05	A-06	A-07	A-08	B-01	B-02	B-03	B-04	B-05	B-06	B-07	B-08	B-09	B-10
Notes: ***Bold italics*** indicates sensitive vegetation type; (Parentheses) indicates vegetation type present but too small to map	APN NO.		444-090-04	181-080-32	181-080-11	181-080-30	181-190-02	153-240-12	153-240-12	153-240-16	181-020-02	181-020-11	181-020-13	153-130-01	153-130-03	153-130-05	153-150-04	153-140-05	153-150-02	153-150-06	153-170-03	153-170-06	153-170-04	444-070-05	444-070-09	153-070-05	153-140-08	153-140-07	153-160-02	153-160-06	153-160-04	153-180-04	153-180-02	153-180-12	153-170-01
VEGETATION TYPE	Rarity Rank	Acreage																																
California Juniper Woodland Vegetation Types																																		
California Juniper Woodland	G4S4																												X					
California Juniper/Blackbrush Woodland																																		
California Juniper/California Buckwheat Woodland																																		
California Juniper/Rubber Rabbitbrush Woodland																																		
California Juniper-Joshua Tree/Blackbrush Woodland																																		
Joshua Tree Woodland Vegetation Types	G4S3.2 (all)																																	
Joshua Tree/Big Sage Woodland																									X									
Joshua Tree/Blackbrush Woodland														X	X	X	X	X	X	X	X	X				X	X	X	X	X	X			X	x
Joshua Tree/California Buckwheat Woodland																										X	X	X							
Joshua Tree/Creosote Bush Woodland																						X			X										
Joshua Tree/Goldenbush Woodland																																			
Joshua Tree/Lower Mojave Mixed Woody Scrub Woodland																					X	X													
Joshua Tree/Nevada Ephedra Woodland																						X													
Joshua Tree/Rubber Rabbitbrush Woodland																																			
Joshua Tree/Upper Mojave Mixed Woody Scrub Woodland																									X	X	X	X			X				
Joshua Tree/White Bursage Woodland							X																												
Oak Forest and Woodland Vegetation Types																																			
Blue Oak Woodland	G4S4																																		
Interior Live Oak Woodland	G4S4																																		
Pine Forest and Woodland Vegetation Types																																			
Gray Pine Woodland	G4S4																																		
Gray Pine-Interior Live Oak Woodland																																			
Jeffrey Pine Forest	G4S4																																		
Singleleaf Pinyon Pine Woodland	G5S4																																		

Table 2 (contd.)																																				
WESTERN PARCELS	Parcel Group		KELSO VALLEY																					LANDERS MDW.			CALIENTE CREEK									
	Parcel Code		K-01	K-02	K-03	K-04	K-05	K-06	K-07	K-08	K-09	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-01	L-02	L-03	C-01	C-02	C-04								
Notes: ***Bold Italics*** indicates sensitive vegetation type; (Parentheses) indicates vegetation type present but too small to map	APN NO.		153-080-02	153-080-08	153-070-03	153-070-02	153-080-05	153-080-04	153-070-07	153-030-05	153-100-03	153-090-01	153-090-03	153-100-13	153-100-10	153-090-05	153-051-03	153-120-02	153-120-04	153-110-01	153-110-03	153-120-07	153-012-03	153-012-05	153-012-07	442-020-20	442-010-10	442-030-01								
VEGETATION TYPE	Rarity Rank	Acreage																																		
Barren, Herb-dominated or Very Sparse Shrubs																																				
Barren																																				
Rock Outcrop			X	X							X							X																		
Annual Grassland							X								X		X	X	X			X				X	X	X								
Developed															X																					
Blackbrush Scrub Vegetation Types																																				
Blackbrush Scrub	G5S4							X	X				X			X				X	X															
Blackbrush-Creosote Bush Scrub																																				
Creosote Bush-White Bursage Scrub Vegetation Types																																				
Creosote Bush Scrub	G5S5																																			
Creosote Bush-White Bursage Scrub	G5S5																																			
Creosote Bush-Desert Senna Scrub																																				
White Bursage Scrub	G5S4																																			
Desert Wash and Terrace Scrub Vegetation Types																																				
Cheesebush Scrub	G5S4																			X																
Allscale Scrub	G5S4																																			
Desert Wash			(X)	(X)	X	X	(X)	(X)	X	(X)	(X)	X	(X)	(X)	(X)	(X)		(X)	(X)	(X)	X	X															
Rubber Rabbitbrush Scrub	G5S5		X	X			X	X			X				X				X	X		X														
Wetland and Riparian Vegetation Types																																				
Blackstem Rabbitbrush Scrub	G4S3																																			
California Coffeeberry Scrub	G4S4		X	X																																
Desert Olive Scrub	G3S2.2										X																									
Desert Riparian Forest and Scrub	G4S4, G4S3.2		X								X				X																					
Meadow and Seep															X				X			X	X													
Mesquite Scrub	G5S3.2																																			
Pond			X												X							X	X													
Scalebroom Scrub	G3S3																																			
Lower Mojave Mixed Woody Scrub																																				
Upper Mojave Mixed Woody Scrub Vegetation Types																																				
Big Sage Scrub	G5S5					X	X				X									X			X	X		X	X	X							
California Buckwheat Scrub	G5S5		X	X		X	X	X	X				X					X								X		X							
Nevada Ephedra Scrub	G4S4.3																																			
Spiny Hopsage Scrub	G5S3.3																																			
Upper Mojave Mixed Woody Scrub																					X															
Wedgeleaf Ceanothus Scrub	G4S4										X																									
Wright's Buckwheat Scrub	G3S3		X	X																																

Table 2 (contd.)																							LANDERS MDW.										
WESTERN PARCELS (contd.)	Parcel Group		KELSO VALLEY GROUP																				GROUP			CALIENTE CREEK GROUP								
	Parcel Code		K-01	K-02	K-03	K-04	K-05	K-06	K-07	K-08	K-09	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-01	L-02	L-03	C-01	C-02	C-04						
VEGETATION TYPE	APN NO.		153-080-02	153-080-08	153-070-03	153-070-02	153-080-05	153-080-04	153-070-07	153-030-05	153-100-03	153-090-01	153-090-03	153-100-13	153-100-10	153-090-05	153-051-03	153-120-02	153-120-04	153-110-01	153-110-03	153-120-07	153-012-03	153-012-05	153-012-07	442-020-20	442-010-10	442-030-01						
	Rarity Rank	Acreage																															
California Juniper Woodland Vegetation Types																																	
California Juniper Woodland	G4S4													X	X			X								X		X						
California Juniper/Blackbrush Woodland																				X	X												
California Juniper/California Buckwheat Woodland																					X												
California Juniper/Rubber Rabbitbrush Woodland																						X											
California Juniper-Joshua Tree/Blackbrush Woodland																					X												
Joshua Tree Woodland Vegetation Types	G4S3.2																																
Joshua Tree/Big Sage Woodland																																	
Joshua Tree/Blackbrush Woodland					X			X	X			X	X			X				X	X												
Joshua Tree/California Buckwheat Woodland									X			X	X																				
Joshua Tree/Creosote Bush Woodland																																	
Joshua Tree/Goldenbush Woodland																X																	
Joshua Tree/Lower Mojave Mixed Woody Scrub Woodland																																	
Joshua Tree/Nevada Ephedra Woodland																				X													
Joshua Tree/Rubber Rabbitbrush Woodland				X			X	X			X				X	X				X													
Joshua Tree/Upper Mojave Mixed Woody Scrub Woodland																																	
Joshua Tree/White Bursage Woodland																																	
Oak Forest and Woodland Vegetation Types																																	
Blue Oak Woodland	G4S4																					X				X	X	X						
Interior Live Oak Woodland	G4S4									X	X			X			X	X																
Pine Forest and Woodland Vegetation Types																																	
Gray Pine Woodland	G4S4										X							X							X	X								
Gray Pine-Interior Live Oak Woodland																		X									X						
Jeffrey Pine Forest	G4S4									X							X						X	X	X									
Singleleaf Pinyon Pine Woodland	G5S4					X								X				X										X						

Typical species on exposed sites included white bursage, California buckwheat (*Eriogonum fasciculatum* var. *polifolium*), and chaparral yucca (*Hesperoyucca whippleyi*). In sheltered sites, some typical species include rock goldenbush (*Ericameria cuneata*), interior goldenbush (*Ericameria linearifolia*), and rock nettle (*Eucnide urens*).

Annual Grassland (Annual Grassland Semi-Natural Herbaceous Stand)

Annual grassland may be found in all topographic settings and soil textures. It is generally defined as having 80 percent relative cover in the herbaceous layer (Sawyer et al., 2009). In the survey area, the most typical species in this vegetation type is red brome, although Mediterranean grass is also present in the lower elevations and cheatgrass is abundant in the higher elevations. None of these species are native to California. Annual grasslands are usually found where a substantial disturbance has removed the native woody vegetation. Fire is one cause, but mechanical disturbance from livestock or vehicular activity can also result in invasion by these non-native grasses.

Annual grassland was mapped in Parcel D-1 in the Dove Spring area, apparently the result of a small wildfire. In Kelso Valley, most of the parcels mapped as having annual grassland had experienced relatively recent fire (parcels K-5, K-13, K-16, K-17, and K-20). Within a few years after a fire in Kelso Valley, rubber rabbitbrush (*Ericameria nauseosa*) invades the annual grassland; in the absence of repeated fire, annual grassland is eventually replaced by other woody dominants such as big sage (*Artemisia tridentata*). The three Caliente Creek parcels also have relatively large areas of annual grassland.

Parcel K-15 has an area mapped as annual grassland, but during the survey this area was found to contain many native wildflowers and appeared to be related to unusual soil conditions rather than disturbance. Typical species in this area were blue field gilia (*Gilia capitata*), variable leptosiphon (*Leptosiphon parviflorus*), Arizona popcornflower (*Plagiobothrys arizonicus*), and California poppy (*Eschscholzia californica*).

Developed

Developed areas have structures, landscaping, or permanently maintained disturbance associated with ongoing human activities. One area mapped as developed is the ranch headquarters at Green Spring in Parcel K-13 in Kelso Valley. The other is an area adjacent to and south of Jawbone Canyon Road in Parcel J-4 which appears to be maintained as permanently bare because of recreational vehicle staging activities. Other developed areas that may be seen in the vicinity of the survey area, such as Los Angeles Department of Water and Power pipeline and corporation yard, are largely excluded from the survey area and therefore were not mapped.

3.1.2 Blackbrush Scrub Vegetation Types

Blackbrush Scrub (*Coleogyne ramosissima* Shrubland Alliance)

Blackbrush scrub (*Coleogyne ramosissima* shrubland alliance) is found on alluvial fans bordering intermountain basins, slopes, upper bajadas, and rocky highlands. Parent materials are mixed alluvium and colluvium. Soils are thin and sandy with abundant exposed rock. They often have a shallow caliche layer and moderate alkalinity. This vegetation type is defined by at least 2 percent blackbrush in the shrub canopy. Associated species such as Nevada ephedra (*Ephedra nevadensis*), green rabbitbrush (*Ericameria teretifolia*), cheesebush (*Ambrosia salsola*), bladder sage (*Scutellaria mexicana*), or California buckwheat may exceed the cover contributed by blackbrush on disturbed sites (Sawyer et al., 2009). Blackbrush is a long-lived, low-growing, many-branched shrub with diffuse, shallow roots and a low tolerance of salinity. Plants are drought-deciduous. Typical stands have shallow soils with caliche layers and well-developed

cryptogamic crusts. Stands are generally simple and monotypic, with shrubs closely to rather widely-spaced. Low soil moisture or cold air drainage set the lower elevation limit for this vegetation type, and cold air temperatures set the upper limit; this vegetation is most common above 3,300 feet in the Mojave Desert (Sawyer et al., 2009). Stands occur abundantly on older geologic soils. Blackbrush is very sensitive to fire, which can spread quickly in closely spaced stands. This species does not sprout after fire and is slow to invade sites once burned.

In the survey area, blackbrush scrub was very extensive in the stable soils found in the gently sloping terrain in the northern Sugarloaf and the Dove Spring parcels, and the uplands in most of the Alphie Canyon and Butterbredt parcels. Small patches were mapped occasionally in the highest elevations of the Jawbone Canyon parcels, on north-facing and gently-sloping sites. It was mapped on six of the Kelso Valley parcels, primarily on the west-facing slopes on the eastern side of the valley.

Blackbrush-Creosote Bush Scrub (Coleogyne ramosissima-Larrea tridentata-Ambrosia dumosa Association)

This vegetation type is much like the preceding, but was found at the lower elevational limit of blackbrush, where it intergrades with creosote bush (*Larrea tridentata*)-white bursage. Shrubs form an open, sparse layer with limited herbs. This vegetation type was mapped on stable flats and gently sloping terrain in the Sugarloaf area in Parcels S-1 and S-2, and in the Alphie Canyon area in Parcels A-5 and A-6.

3.1.3 Creosote Bush and White Bursage Vegetation Types

Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance)

Creosote bush scrub (*Larrea tridentata* shrubland alliance) is found on alluvial fans, bajadas, and upland slopes. Soils are well drained, and sometimes have desert pavement (Sawyer et al., 2009). This vegetation type is defined by the visual dominance of creosote bush, which may exceed other shrubs in cover except for goldenhead (*Ericameria cooperi*), green rabbitbrush, Nevada ephedra, and white bursage, none of which would have more than double the cover of creosote bush. Creosote bush is a very long-lived shrub with low seedling recruitment. It is evergreen and extremely resistant to high temperatures. This species grows well in deep, sandy soils because of its deep, spreading root systems, but also grows well on poorly developed alluvial soils. In sandy situations on wash terrace deposits, creosote bush may be found with allscale (*Atriplex polycarpa*). Creosote bush is poorly adapted to fire because of its limited sprouting ability and highly flammable resinous foliage (Sawyer et al., 2009).

In the survey area, creosote bush scrub was mapped on several parcels in the Jawbone Canyon (Parcels J-1, J-3 and J-4), Sugarloaf (Parcels S-2, S-4 and S-6) and Alphie Canyon (Parcels A-5, A-8) areas. Creosote bush scrub (as opposed to creosote bush-white bursage scrub, below) was generally found in deep soils between high floodplain terraces and lower bajadas.

Creosote Bush-White Bursage Scrub (*Larrea tridentata-Ambrosia dumosa* Shrubland Alliance)

Creosote bush-white bursage scrub (*Larrea tridentata-Ambrosia dumosa* shrubland alliance) is found on minor washes and rills, alluvial fans, bajadas, and upland slopes. Soils are well-drained, alluvial, colluvial, sandy, and sometimes underlain by hardpan (Sawyer et al., 2009). This vegetation type is defined by both creosote bush and white bursage having at least 1 percent in the shrub canopy, and both species having at least twice the cover contributed by other species (Sawyer et al., 2009). Creosote bush-white bursage represents the major vegetation type of California's hot deserts, where it is the typical vegetation on bajadas, alluvial fans, and lower

slopes. Conditions supporting creosote bush-white bursage may range from extremely hot and dry (with attendant low species diversity) to relatively mild and mesic (with higher species diversity) (Sawyer et al., 2009).

The survey area is situated at the western edge of the Mojave Desert, where this vegetation type occupied the more extreme dry, south-facing, exposed sites at lower elevations. Species richness was somewhat lower than other vegetation types. This vegetation type was found in all of the lowest, driest parcels (all five of the parcels in the Jawbone Canyon area, Parcels S-3 through S-6 in the Sugarloaf area, and Parcels A-4 through A-8 in the Alphie Canyon area).

Creosote Bush-Desert Senna Scrub (*Larrea tridentata-Ambrosia dumosa/Senna armata* Association)

Creosote bush-desert senna scrub (creosote bush-white bursage/desert senna (*Senna armata*) association) is a subset of the creosote bush-white bursage alliance that is found in relatively stable desert washes. It was mapped only in Parcel S-6 in the Sugarloaf area. Desert senna was found occasionally at lower elevations in washes and floodplains, but this was the only place where an extensive stand of creosote bush and senna were found together.

White Bursage Scrub (*Ambrosia dumosa* Shrubland Alliance)

White bursage scrub (*Ambrosia dumosa* shrubland alliance) is found on older washes and river terraces, alluvial fans, bajadas, rocky hills, partially stabilized and stabilized sand fields, and upland slopes. Soils are sandy, clay-rich or calcareous and may have pavement surfaces (Sawyer et al., 2009). This vegetation type is defined by white bursage having more than twice as much absolute cover as creosote bush, or white bursage exceeds the cover of other subshrubs. White bursage is a short-lived shrub with relatively shallow roots. It dominates sandy substrates, rocky hills or alluvial fans, and particularly older soils with caliche (calcium carbonate) or clay layers. The geographic distribution of white bursage scrub is similar to that of creosote bush, and the two species, together with Acton's encelia (*Encelia actonii*), form large areas with varying proportions of these shrubs. White bursage is sensitive to fire because it has limited ability to re-sprout.

In the survey area, white bursage scrub was mapped in three parcels (J-2, J-3 and J-5) in the Jawbone Canyon area, two parcels (S-3 and S-5) in the Sugarloaf area and one parcel (A-8) in the Alphie Canyon area. In most of these situations, white bursage was found on exposed ridgetops and lakebed formations that may have had caliche or clay subsoil layers. The mapped white bursage scrub tended to have fairly low cover compared with other vegetation types in the survey area. The difference between this vegetation type and barren areas was only a matter of degree; the areas mapped as barren had extremely low shrub cover.

3.1.4 Desert Wash and Terrace Scrub Vegetation Types

Cheesebush Scrub (*Ambrosia (=Hymenoclea) salsola* Shrubland Alliance)

Cheesebush scrub (*Ambrosia (=Hymenoclea) salsola*) shrubland alliance) is found in valleys, flats, rarely-flooded low-gradient deposits, arroyos, intermittent channels and washes. Soils are alluvial, sandy and gravelly, and disturbed desert pavement. The vegetation type is variously defined as cheesebush having more than 5 percent absolute cover in the shrub canopy; more than 2 percent cover in the shrub canopy but more cover than other shrub species; or more than 1 percent cover with other shrubs less than half the cover of cheesebush (Sawyer et al., 2009). Cheesebush is a short-lived shrub with shallow roots. It colonizes bare mineral soil and also sprouts following damage from flood or fire. It occupies upland sites, such as steep slopes or loose alluvium, as well as bottomland sites. It is a pioneering species after disturbance.

In the survey area, cheesebush shrubland alliance was generally mapped on upper terraces adjacent to the active channel in alluvial fans in canyons. It was found in several parcels in the Jawbone area (J-1, J-2 and J-5), Parcel D-2 in the Dove Spring area, and Parcel S-5 in the Sugarloaf area, as well as a fairly small area in Parcel K-18 in eastern Kelso Valley.

Allscale Scrub (*Atriplex polycarpa* Shrubland Alliance)

Allscale scrub (*Atriplex polycarpa* shrubland alliance) is found in washes, dissected alluvial fans, rolling hills, terraces, and edges of large, low gradient washes. Soils may be carbonate rich, alkaline, sandy or sandy clay loams. The vegetation type is defined as allscale having more than 2 percent absolute cover in the shrub canopy, or more than 50 percent relative cover in the shrub canopy. Allscale is an intricately branched shrub that grows to 6 feet tall. It tolerates moderately saline conditions or dry, non-saline upland sites with shallow water tables. It is sensitive to fire and does not re-sprout if top-killed. Its limited but varied salt tolerance and high drought tolerance interact to define the broad habitat boundaries of the vegetation type (Sawyer et al., 2009).

In the survey area, allscale scrub was mapped in the Jawbone Canyon area on Parcels J-1 through J-4 and in the Alphie Canyon area on Parcels A-5 and A-8, where it occupied the valley floor on terraces just above the active channel. It also was observed as part of the desert wash scrub vegetation type, described next, in the smaller alluvial fans and benches in much of the eastern acquisition area.

Desert Wash

This is a vegetation type consisting of a mix of rocky canyon, desert wash and terrace scrub types with generally low cover where the dominant species were present in a fine-textured mosaic and no single species dominance could be defined at the scale of mapping used in this study. Typical species in this vegetation type include desert baccharis (*Baccharis sergiloides*), sweetbush (*Bebbia juncea*), and shrubby ragwort (*Senecio flaccidus*) in narrow, rocky canyons with subsoil moisture; allscale, cheesebush, rubber rabbitbrush, and white bursage in broader, deeper washes. This vegetation type was found in all parcels in the eastern acquisition area, although sometimes the washes were extremely narrow and too small to map. It also was present in most Kelso Valley parcels.

Rubber Rabbitbrush Scrub (*Ericameria nauseosa* Shrubland Alliance)

Rubber rabbitbrush scrub (*Ericameria nauseosa* shrubland alliance) is found in all topographic settings, especially sites with disturbance. Soils are well-drained sands and gravels. This vegetation type is defined as having rubber rabbitbrush with 2 percent or more absolute cover or more than 25 percent relative cover in the shrub canopy (Sawyer et al., 2009). Rubber rabbitbrush is a fast-growing, relatively short-lived, early-successional shrub that establishes after disturbance. It is well-adapted to the regime of periodic disturbance found in washes and fans with intermittent flooding. It is also fire-adapted, sprouting vigorously after a fire. In stable situations without repeated disturbance, rubber rabbitbrush may be replaced by other species.

In the survey area, rubber rabbitbrush scrub was mapped in Parcel J-4 in Jawbone Canyon, Parcels B-9 and B-10 in Butterbredt Canyon, all large washes experiencing repeated disturbance from periodic flooding. In Kelso Valley, nine parcels were mapped with rubber rabbitbrush; most were extensive areas with recent fires. It appeared that non-native grassland dominated by red brome was the first stage following fire, followed by developing rubber rabbitbrush scrub. In the absence of repeated disturbance rubber rabbitbrush scrub appeared to eventually be replaced by big sage or other long-lived shrubs, as well as singleleaf pinyon pine (*Pinus monophylla*).

3.1.5 Wetland and Riparian Vegetation Types

Blackstem Rabbitbrush Scrub (*Ericameria paniculata* Shrubland Alliance)

Blackstem rabbitbrush scrub (*Ericameria paniculata* shrubland alliance) is found in intermittently flooded arroyos, channels and washes. Soils are coarse to fine sand, usually well drained and moderately acidic to slightly saline. The vegetation type is defined as having more than 5 percent cover of blackstem rabbitbrush with no other shrub having more than 50 percent relative cover (Sawyer et al., 2009). Blackstem rabbitbrush is distinctive in having a rust that causes black banding around the stem. This species is a fast-growing but relatively short-lived shrub that can achieve 16 feet in height and often forms single-species stands. Blackstem rabbitbrush may sprout following minor damage, while large flood events may destroy all shrubs, necessitating seedling recruitment from nearby protected individuals. Stands are localized in medium to large washes where flooding events occur every few years. Blackstem rabbitbrush is ranked S3, meaning it is considered a sensitive natural community statewide (Sawyer et al., 2009).

In the survey area, blackstem rabbitbrush scrub was mapped only in Parcel J-2 in the wash in Poleline Canyon, where it occupied a large, broad wash. Examples too small to map were found in other washes in the eastern acquisition area and were mapped as part of desert wash scrub.

Coffeeberry Scrub (*Frangula (=Rhamnus) californica* Shrubland Alliance)

California coffeeberry scrub (*Frangula (=Rhamnus) californica* shrubland alliance) is found widely in California on concave slopes, lower slopes, along drainages and undulating moderate to steep slopes of sedimentary or serpentine substrates. Soils typically retain moisture for much of the year. California coffeeberry shrubland alliance is defined as having more than 50 percent relative cover in the shrub canopy (Sawyer et al., 2009). California coffeeberry is a long-lived, shade tolerant shrub that can reach 20 feet in height and 200 years in age (Sawyer et al., 2009). It sprouts vigorously from the base following fire, browsing, or cutting. Although this vegetation type is not considered sensitive throughout California, the example mapped in the survey area appeared to be a riparian vegetation type and therefore was considered unusual and sensitive locally.

In the survey area, stands of California coffeeberry were noted along several steep, rocky draws in northern Kelso Valley in Parcels K-1 and K-2. It may be present elsewhere in similar ecological situations on the lower slopes of Piute Mountain west of Kelso Valley. The subspecies of coffeeberry was not determined, but based on distribution it may have been *F. c*. ssp. *tomentella*.

Desert Olive Scrub (*Forestiera pubescens* Shrubland Alliance)

Desert olive scrub *(Forestiera pubescens* shrubland alliance), also referred to as desert olive patches, is found on floodplains, streambanks, springs, river terraces, and washes. Soils range from silty clays to coarse sands. The vegetation type is defined as consisting of more than 50 percent relative cover of desert olive in the shrub layer (Sawyer et al., 2009). Desert olive is a long-lived, spreading shrub or small tree. Plants form clonal thickets and sprout after stem damage (such as from floods, fires, or browse). Desert olive scrub occurs as scattered, small stands in slightly drier conditions upslope from flowing water, in areas with subsurface moisture such as washes and river terraces, and narrows in desert canyon bottoms where moisture is forced to the surface (Sawyer et al., 2009). The statewide ranking of this alliance is S2, meaning it is a sensitive natural community.

In the survey area, a large stand of desert olive scrub was mapped in Parcel K-9 along the lower portion of Esperanza Canyon. It formed a long, dense thicket on the stream terraces above the stream, which appeared to be perennial. It also was present along the lower reaches of Water Canyon in Parcel K-9, lining the willow (*Salix* spp.) scrub but in patches too small to map. This vegetation type may also be present along in some of the other parcels on the eastern foot of Piute Mountain. A very small patch, too small to map, was noted in Parcel D-2, and could also be present near small seeps and springs in Alphie and Butterbredt canyons.

Desert Riparian Forest and Scrub

Desert riparian forest and scrub is an assemblage of MCV2 (Sawyer et al., 2009) alliances dominated by tree and tree-like woody species dependent on fairly consistent subsurface or surface water for most of the year. Desert riparian scrub may be found a springs, along perennial or seasonally intermittent streams, in the lower canyons of desert mountains, and in valleys with a dependable subsurface water supply. Typical dominant species include Fremont cottonwood (*Populus fremontii*), arroyo willow *(Salix lasiolepis*), sandbar willow (*Salix exigua* var. *exigua*), and red willow (*Salix laevigata*). The understory is often fairly sparse and may include rubber rabbitbrush, mule fat (*Baccharis salicifolia*), and big sage (*Artemisia tridentata*), among others. The understory often consists of a dense accumulation of downed branches, litter, and duff. As a result there is often limited development of the herbaceous layer, although peripheral areas often contain a variety of grasses and grass-like plants. Desert riparian forest and scrub is a sensitive vegetation type that is rare in the region and provides high wildlife value.

In the survey area desert riparian forest and scrub was found in association with other shrubby and herbaceous wetland vegetation types, such as the rubber rabbitbrush scrub, meadow and seep, and desert wash. The largest areas of desert riparian forest and scrub were mapped in Parcel D-2 in the Dove Spring area, Parcels A-4 and A-5 in the Alphie Springs area, and Parcels K-9 and K-13 in the Kelso Valley area. Additional riparian forest is probably present in the steep canyons of the western Kelso Valley parcels, such as K-8, K-12, K-15 and K-16, but these were not visited in detail and could not be characterized.

Meadow and Seep

Meadow and seep habitats occupy relatively small areas in desert and mountainous areas in California, but their importance to species diversity and wildlife habitat is very high. Due to their typically small size, these habitats have been mapped together in the survey area, but they consist of several somewhat different vegetation types. These will be described below.

Baltic and Mexican rush (*Juncus balticus* and *J. mexicanus*) are sometimes treated as varieties of *Juncus arcticus* (vars. *balticus* and *mexicanus*), as they are in Sawyer et al., 2009). Thus, the alliance described in the Manual of California Vegetation is the **Baltic and Mexican rush (*Juncus arcticus*) herbaceous alliance**. Particularly because the two rushes were difficult to reliably distinguish in the field, this vegetation type is simply referred to here as **rush meadow**. Rush meadows are found in wet and mesic situations, along stream banks, rivers, lakes, ponds, fens, and sloughs, in freshwater, brackish and alkaline marshes. Soils are poorly drained, often with a thick organic layer. Plants form dense stands because of their dense rhizomes. Plants grow in shallow soil, but the rooting depth varies greatly. This species tolerates disturbance, usually resulting from flooding and deposition, although it can also resprout following fire Sawyer et al., 2009).

In the survey area, the most extensive marshes were found at Green Spring in Kelso Valley (parcels K-13, K-17 and K-20) where rush meadows occupy the lowest position, surrounded by salt grass (*Distichlis spicata*) and alkali sacaton (*Sporobolus airoides*) on the periphery. Small

patches of rush meadow were found at nearly all of the seeps and springs, including the springs in Parcels J-3 and J-5 in the Jawbone Canyon area; Parcel D-2 in the Dove Spring area; Parcels A-4 and A-5 in the Alphie Canyon area; and Parcels B-9 and B-10 in the Butterbredt area. In addition, extensive areas of rush meadow were mapped at Landers Meadow, in Parcels L-1 and L-2.

In the desert, the **salt grass grassland (*Distichlis spicata* herbaceous alliance)** is found on playas, swales, seeps, and terraces along washes that are typically intermittently flooded. Soils are often deep, alkaline or saline, and may have an impermeable layer making them poorly drained. When the soil is dry, the surface usually has salt accumulations (Sawyer et al., 2009). Salt grass is a rhizomatous, warm-season grass that is widespread in North America. It may form a dense thatch in suitable habitat. The leaves have special salt glands that allow for extrusion of salt to maintain osmotic balance in the plant.

In the survey area, salt grass grassland was closely associated with seeps and springs, growing at the periphery of the rush alliance. The most extensive area of salt grass was at Green Spring in Kelso Valley, a complex of seeps and springs occupying several hundred acres in parcels K-13, K-17 and K-20. Other, small areas of salt grass grassland were associated with spring and seeps in the eastern acquisition area, including Butterbredt Springs and several springs farther downstream (Parcels B-9 and B-10), a complex of springs along the Sierra Nevada fault line in Alphie Canyon (Parcel A-5) and in several canyons to the east (Parcels A-4, A-6, A-7 and A-8), and along the Dove Spring canyon (Parcel D-2).

Alkali sacaton grassland (*Sporobolus airoides* herbaceous alliance) is found on alluvial flats, basins, stream terraces, swales, valley bottoms, and lower portions of alluvial slopes. Soils are non-saline to moderately saline, and usually alkaline. The vegetation type is defined by alkali sacaton comprising more than 50 percent relative cover in the herbaceous layer (Sawyer et al., 2009). Alkali sacaton is a long-lived, warm-season, tussock-forming grass that grows to over 3 feet in height. It has a broad tolerance to salinity and pH conditions. Stands usually occur in seasonally wet, alkaline areas. They usually form a mosaic with other meadow and shrubland types. In the survey area, this alliance was found as part of the Green Springs meadow complex of habitats in Kelso Valley (Parcels K-13, K-17 and K-20).

Mesquite Scrub *(Prosopis glandulosa* Woodland Alliance)

Mesquite scrub (*Prosopis glandulosa* woodland alliance) is found in sites with access to permanent underground water; deep roots tap water supplies up to 15 m (50 ft) below the surface (Sawyer et al., 2009). This vegetation type is defined as having at least 3 percent absolute cover of mesquite and is not exceeded by any other species of shrub or tree (Sawyer et al., 2009). Mesquite scrub is found on the fringes of playa lakes, river terraces, stream banks, floodplains, and sometimes the flooded margins of arroyos and washes and sand dunes, although they are generally not found in close association with rivers. Frost sensitivity creates an upper altitudinal limit for this vegetation type, and other limiting factors include flooding, shifting sand, and fires. Mesquite scrub is a sensitive vegetation type, and is quite rare in the western Mojave Desert.

Mesquite scrub was mapped in only one locality in the survey area, a seep on the eastern slope of Sugarloaf Mountain in Parcel S-5. It was a very small locality at a small spring. The understory was very limited and there were no other woody associates. Some other small examples of this alliance may be present elsewhere in the Sugarloaf parcels but could not be verified during 2012 surveys.

Pond

This vegetation type is generally associated with desert riparian forest and scrub or meadow and seeps. Pond habitat may support emergent species such as spikerush (*Eleocharis* spp.), cattails (*Typha latifolia*), and rush, as well as aquatic species such as water speedwell (*Veronica anagallis-aquatica*) and duckweed (*Lemna* sp.). Examples were observed in Parcel A-4 in the Alphie Canyon area, in Parcels K-1 and K-13 in the Kelso Valley area, and in Parcel L-1 in the Landers Meadow area.

Scalebroom scrub (*Lepidospartum squamatum* Shrubland Alliance)

Scalebroom scrub (*Lepidospartum squamatum* shrubland alliance) is found along intermittently or rarely flooded, low-gradient alluvial deposits along streams, washes, and fans. Soils range in texture from fine to coarse and may be somewhat layered. Scalebroom scrub is defined as having more than 1 percent cover in alluvial environments (Sawyer et al., 2009). Scalebroom is a woody, broom-like shrub that grows up to more than 6 feet tall. It is well-adapted to the dynamic conditions of desert washes; seedlings become established in moist soil among older shrubs, while older plants sprout from branches and crown bases. It can become established from plant fragments dispersed downstream in scouring floods, and root crowns can sprout from deep beneath flood-deposited alluvium or on alluvial fans. Scalebroom shrubland alliance is ranked S3, meaning it is a sensitive natural community in California.

Scalebroom scrub was mapped only in the largest desert washes. It was mapped in three parcels in Jawbone Canyon (Parcels J-3, J-4 and J-5) at the edge of the active channel and a small area of scale broom was also mapped in the Dove Spring wash in Parcel D-2. Areas of scalebroom too small to map were observed along other large active channels in the eastern acquisition area.

3.1.6 Lower Mojave Mixed Woody Scrub

Lower Mojave mixed woody scrub is a collective term for the vegetation found in the survey area on low-elevation and south-facing slopes, and often in rocky sites with limited soil development. It often has a fine-textured mosaic of dominant species with no one species dominant over large areas. Typical species include white bursage, Acton's encelia, bladder sage, grape lupine (*Lupinus excubitus*), little leaf Mojave indigo bush (=indigo bush, *Psorothamnus arborescens* var. *minutifolius*) and green rabbitbrush.

This vegetation type was abundant in the eastern acquisition area. It was observed and mapped in Jawbone Parcel A-1, Sugarloaf Parcels S-3 and S-5, Dove Spring Parcel D-2, Alphie Canyon Parcels A-4 through A-7 and Butterbredt Canyon Parcel B-7.

3.1.7 Upper Mojave Mixed Woody Scrub Vegetation Types

Upper Mojave mixed woody scrub is a category devised for this survey to describe vegetation types found at higher, cooler and moister sites than creosote bush scrub and white bursage. It includes several specific vegetation types and also is a collective term for a fine-textured mosaic without a single dominant species.

Big Sage Scrub (*Artemisia tridentata* Shrubland Alliance)

Big sage scrub (*Artemisia tridentata* shrubland alliance) is found on plains, alluvial fans, bajadas, pediments, lower slopes, valley bottoms, seasonal and perennial stream channels, and dry washes. Soils are sandy to loamy, well-drained and deep, but generally not alkaline or saturated for long periods. This vegetation type is defined by big sage having at least 2 percent absolute cover in the shrub canopy and no other species with greater cover (Sawyer et al., 2009). Shrubs may live to 50 years. Stands are sensitive to fire because shrubs do not sprout after fire.

In the survey area, big sage scrub was mapped on four parcels in the Kelso Valley area (K-4, K-5, K-9 and K-18), two parcels in the Landers Meadow area (L-1 and L-2) and the Caliente Creek area (C-1, C-2 and C-4). Typical associates in the survey area included green ephedra, bitterbrush (*Purshia tridentata*), Nevada ephedra and blackbrush.

California Buckwheat Scrub (*Eriogonum fasciculatum* Shrubland Alliance)

California buckwheat scrub (*Eriogonum fasciculatum* shrubland alliance) is found on upland slopes, intermittently flooded arroyos, cannels and washes, and rarely flooded low-gradient deposits. Soils are coarse, well drained and moderately acidic to slightly saline. This vegetation type is defined by California buckwheat having more than 5 percent absolute cover in the shrub canopy; or at least 50 percent relative cover in the shrub canopy (Sawyer et al., 2009). California buckwheat is a semi-woody, many-branching shrub with roots that penetrate to nearly 5 feet. Stands do well on rocky sites and in shallow soils, and they establish well after disturbance by fire or flood or even heavy grazing.

In the survey area, California buckwheat scrub was widespread in the rocky uplands. It was mapped in Butterbredt Parcel B-7, nearly half of the Kelso Valley parcels, mainly on the eastern slopes between Kelso Valley and Butterbredt Canyon; and in Parcels C-1 and C-4 in the Caliente Creek area.

Nevada Ephedra Scrub (*Ephedra nevadensis* Shrubland Alliance)

Nevada ephedra scrub (*Ephedra nevadensis* shrubland alliance) is found on dry, open slopes, ridges, breaks with southern exposures, canyons, sides of arroyos, floodplains and washes. Soils are well drained, gravelly or rocky, and may be saline or alkaline. This vegetation type is defined by Nevada ephedra contributing at least 2 percent absolute cover in the shrub layer. Nevada ephedra is a relatively slow-growing shrub that spreads clonally and may survive for more than 100 years. Stands are common but widely scattered throughout the mid-elevations of the Mojave Desert, and the species is a component of many alliances. Nevada ephedra scrub can include a variety of shrubs such as big sage, green ephedra, bitterbrush, spiny hopsage (*Grayia spinosa*), and blackbrush. Nevada ephedra readily sprouts from the root or crown after low or moderate intensity fires.

In the survey area, Nevada ephedra was found mainly at elevations above the creosote bush-white bursage level. Only one example was mapped in the eastern acquisition area; in Parcel J-3 in the Jawbone Canyon area, one stand was observed on a north-facing slope at the top of the hills south of Jawbone Canyon. Although this species was observed occasionally in the upper Alphie Canyon and Butterbredt Canyon areas, no other large stands were mapped within the survey area.

Spiny Hopsage Scrub (*Grayia spinosa* Shrubland Alliance)

Spiny hopsage scrub (*Grayia spinosa* shrubland alliance) occupies basins, valleys, bajadas, and mountain slopes. Soils are deep and alluvial, and can vary from alkaline and calcareous clays to sandy soils free of salt accumulations and hardpans. This vegetation type is defined by spiny hopsage contributing at least 2 percent cover in the shrub canopy and with cover at least as great as any other species (Sawyer et al., 2009). Spiny hopsage is a long-lived, diffusely branched shrub that reaches nearly 5 feet in height. Stands are small but widespread in the Mojave Desert. They usually occur at elevations higher than creosote bush scrub and lower than big sage. Shrub density and cover tend to increase with stand age. The state rank of this alliance is S3, meaning it is a sensitive alliance in California.

In the survey area, spiny hopsage was mapped in only three areas—the upper slopes of the mountains in Parcel J-3, just south of Jawbone Canyon, and Kelso Valley Parcels K-1 and K-2. Additional small areas of spiny hopsage scrub may be present in the uplands in the Butterbredt Canyon, Alphie Canyon, and Kelso Valley parcels.

Upper Mojave Mixed Woody Scrub

This vegetation type is a catch-all for vegetation dominated by a variety of species in a fine-textured mosaic, with no one species dominating a large area. Typical species include spiny hopsage, big sage, bitterbrush, green rabbitbrush, interior goldenbush, Cooper's box thorn (*Lycium cooperi*), horsebrush (*Tetradymia* spp.) and Nevada ephedra. This vegetation type was typically found at higher elevations in the eastern acquisition area, and on hills and slopes in the western acquisition area. It was mapped in the Dove Spring area in Parcel D-2 and in Kelso Valley in Parcel K-19.

Wedge Leaf Ceanothus Scrub (*Ceanothus cuneatus* Shrubland Alliance)

Wedge leaf ceanothus (*Ceanothus cuneatus* shrubland alliance) is found on ridges and upper slopes, on shallow, rocky and well-drained soils (Sawyer et al., 2009). This vegetation type is defined by wedge leaf ceanothus having more than 60 percent cover in the shrub canopy. Wedge leaf ceanothus is an evergreen shrub with thorny, rigid branches that grows to more than 10 feet in height. Stands are often dense, with interlocking crowns that contain considerable dead wood, or stands may be open with much bare ground. The species is an obligate seeder; that is, the plant is killed by fire, but fire breaks seed dormancy, and abundant germination takes place following fire.

This vegetation type is more a montane type than desert. Considerable wedge leaf ceanothus was observed as a co-dominant or sub-dominant on the lower slopes of Piute Mountain on the western side of Kelso Valley. This alliance was mapped only on Parcel K-9, although examples may also be present in the western Kelso Valley parcels and possibly in Caliente Creek, in areas of relatively frequent fires.

Wright's Buckwheat Scrub (*Eriogonum wrightii* Dwarf Shrubland Alliance)

Wright's buckwheat scrub (*Eriogonum wrightii* dwarf shrubland alliance) is found on flats, ridgetops, and stony slopes on granitic, sedimentary or serpentinite substrates. Soils are typically loams or clays (Sawyer et al., 2009). This vegetation type is defined by Wright's buckwheat comprising more than 50 percent relative cover in the shrub canopy. Wright's buckwheat is an intricately branched low shrub with gray leaves. Its distinctive, fine-textured, rather dark appearance is easy to discern from a distance. The state rank of this alliance is S3, meaning it is a sensitive vegetation type in California.

In the survey area, Wright's buckwheat scrub was found at the northern end of Kelso Valley, in Parcels K-1 and K-2. It may occur in areas too small to map elsewhere in Kelso Valley.

3.1.8 California Juniper Woodland Vegetation Types

California Juniper Woodland (*Juniperus californica* Woodland Alliance)

California juniper woodland (*Juniperus californica* woodland alliance) is found on ridges, slopes, valleys, alluvial fans, and valley bottoms. This vegetation type is loosely defined as California juniper having more than 3 percent absolute cover over lower shrubs; or California juniper having more than 1 percent cover as a dominant shrub or tree and no other tree species exceeding the cover of California juniper (Sawyer et al., 2009). Soils are porous, rocky, coarse, sandy or silty, and are often very shallow. California juniper is a slow-growing shrub or small tree that usually

grows to about 13 feet in height. It may appear as a single dominant tree species over a variety of smaller shrubs, including blackbrush, rabbitbrush, and California buckwheat; or may be present with other trees such as singleleaf pinyon pine or with Joshua tree. California juniper does not sprout after fire, and stands may be eliminated by repeated fire (Sawyer et al., 2009). Because California juniper is so slow-growing, stand recovery from a single fire event may take over 125 years (Sawyer et al., 2009).

Several associations were identified in the survey area within the California juniper woodland alliance. These included:

California juniper/blackbrush woodland
California juniper/rubber rabbitbrush woodland
California juniper/California buckwheat woodland
California juniper-Joshua tree/blackbrush woodland

In the survey area, California juniper woodland and its associations were mapped in the upper portion of Parcel B-4 in the Butterbredt area, Parcels C-1 and C-4 in the Caliente Creek area, and Parcels K-12, K-13, K-16, K-18, K-19, and K-20 in the Kelso Valley area.

3.1.9 Joshua Tree Woodland Vegetation Types

Joshua Tree Woodland (*Yucca brevifolia* Woodland Alliance)

Joshua tree woodland (*Yucca brevifolia* woodland alliance) is found on gentle alluvial fans, ridges, gentle to moderate slopes with coarse sands, very fine silts, gravel or sandy loams. This vegetation type is defined as having Joshua tree having at least 1 percent cover, with juniper or pine species having less than 1 percent absolute cover in the tree canopy (Sawyer et al., 2009). Joshua trees are relatively long-lived plants that typify the Mojave Desert region. Vegetative reproduction is the most common method of propagation, and clonal, multi-stemmed clusters of Joshua trees may be seen throughout its range. There is a high degree of stand-to-stand variation in structure and species composition in Joshua tree woodland (Sawyer et al., 2009); Joshua trees can grow over an open canopy of shrubs or grasses comprised of many species. The fire resistance of Joshua trees increases with age because the thick mat of dried leaves along the trunk decreases with age, and the corky bark of older trunks serves as insulation. Plants respond to fire by sprouting after low-severity fires, but high-severity fires may kill Joshua trees.

Many expressions of Joshua tree woodland were observed over a considerable range of elevation and soil conditions in the survey area:

Joshua tree/goldenbush woodland
Joshua tree/white bursage woodland
Joshua tree/big sage woodland
Joshua tree/blackbrush woodland
Joshua tree/Nevada ephedra woodland
Joshua tree/rubber rabbitbrush woodland
Joshua tree/California buckwheat woodland
Joshua tree/creosote bush woodland
Joshua tree/ lower Mojave mixed woody scrub woodland
Joshua tree/ upper Mojave mixed woody scrub woodland

These vegetation types were found in nearly all of the Dove Spring, Butterbredt, and Alphie Canyon parcels. They were mapped in 12 out of the 20 Kelso Valley parcels, in the valley and

lower slopes on the western side, and far into the uplands on the eastern side of the valley. Joshua tree woodland was mapped in only one Jawbone Canyon parcel (J-5) and was absent from the Sugarloaf, Caliente Creek and Landers Meadow parcels.

3.1.10 Oak Forest and Woodland Vegetation Types

Blue Oak Woodland (*Quercus douglasii* Woodland Alliance)

Blue oak woodland (*Quercus douglasii* woodland alliance) is found on hillsides, valley bottoms, and rocky outcrops, in shallow, rocky soils with low fertility. The vegetation type is defined as blue oak having more than 50 percent relative cover in the tree canopy (Sawyer et al., 2009). Blue oak is a drought- and flood-tolerant tree that can sprout after cutting or burning (Sawyer et al., 2009). Blue oak woodland establishes in varied stands and can form savannas or woodlands with a variety of co-dominants; on the east side of the Sierra Nevada, typical co-dominants would include California juniper, and interior live oak (*Quercus wislizenii*).

The *Quercus douglasii* woodland alliance was found in a single area at the southern end of Kelso Valley in Parcel K-20. Fire frequency may limit the extent of this vegetation type in Kelso Valley. It also was mapped in all three of the Caliente Creek parcels, where it was fairly widespread.

Interior Live Oak Woodland (*Quercus wislizenii* Woodland Alliance)

Interior live oak woodland (*Quercus wislizenii* woodland alliance) is found on upland slopes, valley bottoms, and terraces where soils are shallow and moderately to excessively drained. This vegetation type is defined as interior live oak having more than 50 percent relative cover and 15 percent absolute cover in the tree canopy (Sawyer et al., 2009). Interior live oak is a slow-growing evergreen tree that can live for 200 years with root systems that can be much older (Sawyer et al., 2009). This species is well adapted to fires with relatively thick bark on mature trees. Throughout its wide range in California, interior live oak can form savannas or woodlands with a variety of hardwood and conifer species.

In the survey area, depending on site conditions, interior live oak co-dominated with singleleaf pine, gray pine (*Pinus sabiniana*) and canyon live oak (*Quercus chrysolepis*). Interior live oak appeared to be the predominant vegetation for some years following a fire, when it sprouts abundantly and assumes dominance; as the pines become larger they overtop the interior live oak and become the dominant species until the next fire cycle. Interior live oak woodland alliance was mapped in several parcels on the western side of Kelso Valley (Parcels K-8, K-9, K-12, K-15, and K-16), as well as several parcels in the Caliente Creek area.

3.1.11 Pine Forest and Woodland Vegetation Types

Gray Pine Woodland (*Pinus sabiniana* Woodland Alliance)

Gray pine (or ghost pine; *Pinus sabiniana* woodland alliance) is found on streamside terraces, valleys, slopes, and ridges. This vegetation type is defined as gray pine having more than 10 percent absolute cover and dominant in the tree canopy (Sawyer et al., 2009). It is found on soils that are shallow, often stony, infertile, and moderately to excessively drained. Gray pine woodland occupies rough foothill slopes intermixed with stands of chaparral. Gray pine is a drought tolerant conifer that is fire sensitive despite its relatively thick bark on mature individuals (Sawyer et al., 2009). Although found at elevations as low as 1000 ft, this vegetation type is found at higher elevations on the eastern side of the Sierra Nevada, where it grows along stream terraces below the conifer belt. On the western slopes of the Sierra Nevada, gray pine woodland

occupies a broad belt at lower elevations. It often appears as an emergent tree over a chaparral understory, but may also occur as an open savanna over an herbaceous understory.

In the survey area, gray pine woodland was found in all three of the Caliente Creek parcels, and in two parcels (K-9 and K-16) on the western side of Kelso Valley. In Parcel K-9, this alliance forms a riparian strip in some deeper alluvial soil along the terraces of Water Canyon as it descends into Kelso Valley.

Gray Pine-Interior Live Oak Woodland (*Pinus sabiniana-Quercus wislizenii* Woodland Association)

This vegetation type is found in similar ecological situations as the preceding, but consists of a denser canopy co-dominated by gray pine and interior live oak. This vegetation type was mapped on the steep western slopes of Piute Mountain in the Caliente Creek drainage, in Parcels C-2 and C-4.

Jeffrey Pine Forest (*Pinus jeffreyi* Forest Alliance)

Jeffrey pine forest (*Pinus jeffreyi* forest alliance) is found on raised stream benches, slopes, ridges and plateaus. Soils are typically shallow and infertile. The vegetation type is defined as Jeffrey pine having more than 5 percent absolute cover in the tree cover, with other conifer species having no more than 5 percent cover (Sawyer et al., 2009). In the region of the survey area Jeffrey pine forest is typically found at the higher elevations in the Piute Mountain area. Jeffrey pine is a conifer that attains a height of nearly 200 feet and an age of 500 years (Sawyer et al., 2009). Trees are shade in tolerant and grow most rapidly in full sunlight. This vegetation type is typically an early- to mid-seral (successional) species on productive sites, eventually being replaced by more shade-tolerant species under long fire intervals. The amount of tree cover varies in Jeffrey pine forest. Jeffrey pines are moderately resistant to fire, although sensitivity varies with fire intensity, age of tree, and season.

In the survey area, Jeffrey pine forest was found at the highest elevations in the Piute Mountain, in the highest-elevation parcels (K-8 and K-15) on the western side of Kelso Valley, and in all three parcels (L-1 through L-3) surrounding Landers Meadow. Associated tree species included singleleaf pinyon pine, interior live oak, and Oregon oak (*Quercus garryana* var. *breweri*).

Singleleaf Pinyon Pine Woodland (*Pinus monophylla* Woodland Alliance)

Singleleaf pinyon pine woodland (*Pinus monophylla* woodland alliance) is found on alluvial fans, pediments, slopes, ridges, canyons and ravines. This vegetation type is defined as singleleaf pinyon pine having more than 5 percent absolute cover in the tree canopy (Sawyer et al., 2009). Soils are typically well drained. Singleleaf pinyon pine is a slow-growing conifer that attains a height of 40 feet and an age of 800 years. This vegetation type is typically found at higher elevations in desert mountains and in desert transitions on the eastern side of the Sierra Nevada, where it is believed to be relictual; this and other conifer alliances (such as California juniper) were probably much more widespread in the Mojave Desert during and following the Pleistocene. Singleleaf pinyon pine does not sprout after a fire, and repeated, even moderate, surface fires remove stands. Singleleaf pinyon pine is often co-dominant with California juniper and a variety of shrubs typical of the upper mixed Mojave Desert scrub vegetation type.

In the survey area, singleleaf pinyon pine woodland was found in one of the Caliente Creek parcels (C-4) and the upper elevation rim of Kelso Valley on the eastern (Parcel K-4) and western slopes (Parcels K-12 and K-16).

3.2 Special-status Plants

As noted in the methods section, Appendix A summarizes the name, status, habitat and potential to occur of 52 special-status species considered in this study on the basis of CNDDB and CNPS queries. Of these, 39 species were considered to have at least moderate potential to occur in the project area. This large number of potentially-occurring species is the result of the considerable geographic, elevational, and habitat range encompassed by the project area. **Figure 3** shows reported (by others) and observed (during 2012 field surveys) special-status plant records within 5 miles of the survey area. **Table 3** presents a parcel-by-parcel assessment of potential to occur for these species. **Appendix E** presents California Natural Diversity Database field forms for special-status plant observations in 2012.

The following paragraphs present information on the appearance, status, habitat, distribution, and likely occurrence of the 39 species deemed to have at least moderate potential to occur within the EKCA project area. Ten special-status plants were observed in the survey area in 2012 or have been reported previously from project parcels.

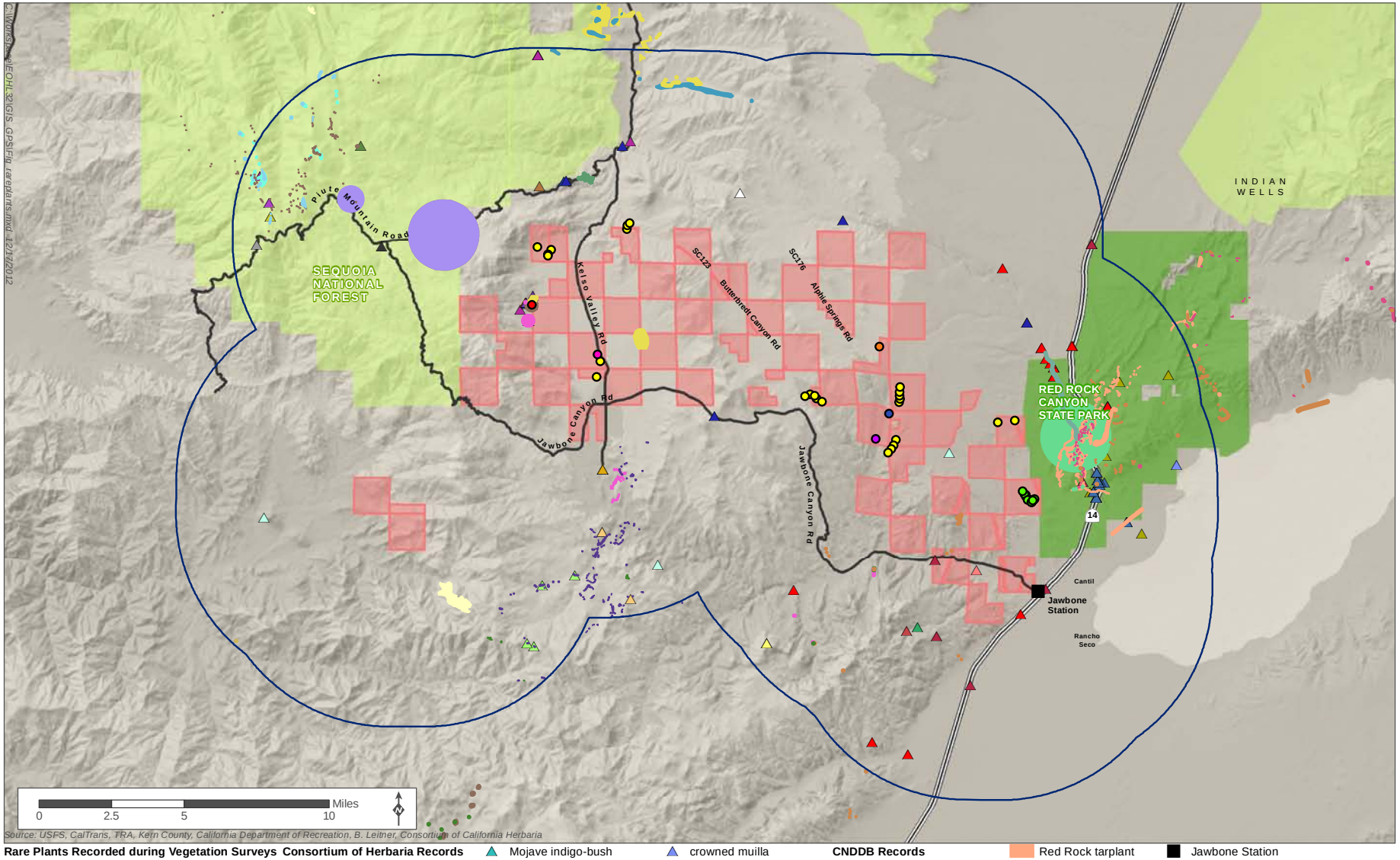
***Allium shevockii* (Spanish Needle onion)**

Spanish Needle onion has no state or federal listing status, but has a CRPRof 1B.3, meaning it is rare, threatened, or endangered in California and elsewhere, but not very endangered in California (CNPS, 2012). It is designated by both BLM Bakersfield and Ridgecrest Resource areas as sensitive (BLM, 2011).

Spanish Needle onion is a bulb-forming perennial herb in the onion family (Alliaceae; formerly within the lily family, Liliaceae) that is 4 to 9 inches tall. Its leaves are cylindric, and the inflorescence is a head-like cluster of 12-30 flowers (Baldwin et al., 2012). The perianth (sepal and petal) parts are white to green at the base, and deep maroon at the recurved tips. The flowering period for Spanish Needle onion is from May to July (CNPS, 2012; Baldwin et al., 2012). Habitat for this species is typically pinyon and juniper woodland and upper montane coniferous forest. It is found on clay, on talus or loose, deep gravel, often at the edge of rock outcrops. It is reported from dark-colored andesite or granitic rock, as well as from metamorphic outcrops. Known occurrences range in elevation from 2,800 to 8,200 feet.

Spanish Needle onion is restricted to Kern County. It is known from ten localities, from Spanish Needle Peak southward to Horse Canyon north of Highway 58 (CNDDB, 2012b; CCH, 2012). It was found in the North Sky River Wind Farm project area in 2010 (GANDA, 2010), and several records are reported from tributary canyons in Jawbone Canyon in the vicinity of Blue Point where it is found on dark metamorphic rock.

We visited CNDDB Occurrence 7 nearest Blue Point twice during 2012 surveys. In March a small colony of vegetative *Allium* (recognizable from the onion odor when bruised slightly) was found on a tiny clay pocket in a rock outcropping. It had been grazed by herbivores; herbivory no doubt intensified as the dry winter and spring progressed. No sign of the colony was found during a subsequent visit in early May. No obviously suitable metamorphic rock outcrop habitat was observed on any of the eastern acquisition parcels, and the known populations are generally at higher elevations than these. Suitable habitat could be present in the pinyon-juniper and upper montane conifer forest habitat at the higher elevations in some of the western parcels, such as Parcels K-8, -12, -15 and -16 in the upper elevations of the Kelso Valley area and Parcel L-3 in Landers Meadow.



Rare Plants Recorded during Vegetation Surveys
- Palmer's mariposa lily
- Castilleja plagiotoma
- Death Valley sandmat
- Mojave spineflower
- Desert cymopterus
- Charlotte's phacelia
- Mojave fish-hook cactus

Consortium of Herbaria Records
- Brandegee's eriastrum
- Breedlove's buckwheat
- Charlotte's phacelia
- Death Valley sandmat
- Hubby's phacelia
- Kelso Creek monkeyflower
- Kern Canyon clarkia
- Kern County evening-primrose
- Mojave fishhook cactus
- Mojave indigo-bush
- Mojave spineflower
- Mojave tarplant
- Palmer's mariposa-lily
- Peirson's spring beauty
- Red Rock poppy
- Red Rock tarplant
- Tracy's eriastrum
- Transverse Range phacelia
- alkali mariposa-lily
- crowned muilla
- fragile pentachaeta
- intermontane lupine
- limestone dudleya
- pine fritillary
- silky lupine
- solitary blazing star
- streambank spring beauty
- unexpected larkspur
- white pygmy poppy

CNDDB Records
- Breedlove's buckwheat
- Charlotte's phacelia
- Kelso Creek monkeyflower
- Kern Canyon clarkia
- Mojave tarplant
- Palmer's mariposa-lily
- Piute cypress
- Red Rock poppy
- Red Rock tarplant
- San Bernardino aster
- Spanish Needle onion
- Tracy's eriastrum
- alkali mariposa-lily
- calico monkeyflower
- creamy blazing star
- unexpected larkspur
- white pygmy-poppy

- Jawbone Station
- State Route
- Local Roads
- Re Nu Parcels
- 5 mile buffer

Figure 3 Special-status Plants in and near the Eastern Kern County Acquisition Project

Eastern Kern County Acquisition Project Botanical Resources Report

Table 3. Assessment of Special-status Plant Species Potential to Occur, Eastern Kern County Acquisition Project

EASTERN PARCELS

		Parcel Group	JAWBONE AREA					SUGARLOAF AREA						DOVE SPRING				ALPHIE CANYON								BUTTERBREDT										
		Parcel Code	J-01	J-02	J-03	J-04	J-05	S-01	S-02	S-03	S-04	S-05	S-06	D-01	D-02	D-03	D-04	A-01	A-02	A-03	A-04	A-05	A-06	A-07	A-08	B-01	B-02	B-03	B-04	B-05	B-06	B-07	B-08	B-09	B-10
	Notes: 1. Species in Appendix A considered "unlikely to occur" are not included here; 2. "Moderate"," high" and "present" are indicated; however, many species have low potential to occur throughout study area		444-090-04	181-080-32	181-080-11	181-080-30	181-190-02	153-240-12	153-240-12	153-240-16	181-020-02	181-020-11	181-020-13	153-130-01	153-130-03	153-130-05	153-150-04	153-140-05	153-150-02	153-150-06	153-170-03	153-170-06	153-170-04	444-070-05	444-070-09	153-070-05	153-140-08	153-140-07	153-160-02	153-160-06	153-160-04	153-180-04	153-180-02	153-180-12	153-170-01
Species	Habitat (1)	CNPS Rank	166	84	85	86	87	78	79	80	81	82	83	177	58	62	64	59	63	68	70	76	77	157	164	38	61	60	65	66	67	73	72	71	69
Allium shevockii	Metamorphic outcrops, talus, PJW, UMCF	1B.3																																	
Androsace elongata ssp. *acuta*	Mdws and seeps, many communities	4.2																																	
California macrophylla	Clay flats, CMWdld, grasslands	1B.1																																	
Calochortus palmeri var. *palmeri*	Mdws, vernally moist places, YPF, Chap	1B.2																																	
Calochortus striatus	Alkaline Mdws, moist CBS	1B.2					M								M						M	H											H	H
Camissonia kernensis ssp. *kernensis*	Sandy slopes, flats, sagebrush scrub or JTW	4.3												M	M	M	M	M	M							H	H	H	H	M	H		M	M	M
Canbya candida	JTW, MDS, sandy places	4.2	M	M	M			M	M					H	M	H	M	H	H		M		M			H	H	H	M		M				
Castilleja plagiotoma	Dry sagebrush scrub, pinyon woodland	4.3																																	
Chamaesyce vallis-mortae	MDS; dry, sandy places	4.2	H	H	H	H	M	H	H	P	H	H	H	H	H	H	P	H	H	H	P	H	P	P	H	H	H	H	H	M	H	M	M	P	P
Chorizanthe spinosa	Sand or gravel	4.2		H		H	H	H	H	H	H	M	P																						
Clarkia xantiana ssp. *parviflora*	Chap, VFGrs, Cis Wdld, GBS, dry slopes, sandy or rocky	4.2																																	
Claytonia parviflora ssp. *grandiflora*	Vernally moist, often disturbed sites in CMWdld	4.2					M																												
Cymopterus deserticola	Sandy soils, JTW, MDS	1B.2					M			M										P				M											
Deinandra arida	Clay, volcanic tuff; washes, edge of springs, seeps, washes	1B.2		M			M		M	M	M		M																						
Deinandra mohavensis	Moist sites, openings in chaparral, desert scrub, wdld	1B.3	M				H								M						M	H											H	H
Delphinium inopinum	UMCFrs, rock outcrops, metamorphic substrates	4.3																																	
Dudleya abramsii ssp. *calcicola*	Open, rocky, granite or limestone outcrops in Chap., PJW	4.3	M	M	H	M	M			M	H	H		M								M	M	M	M	M	M	M		M		M			M
Eriastrum tracyi	Open areas, shale or alluvium, Chap or CMWdld	3.2																																	
Eriogonum breedloveei var. *breedlovei*	PJW, UMCF; carbonate, quartzite	1B.2																																	
Eschscholzia minutiflora ssp. *twisselmannii*	MDS, desert washes, flats slopes; tuff	1B.2				M	M			M	M		M																						
Fritillaria pinetorum	Shaded granitic slopes in chap, coniferous forest, PJW	4.3																																	
Hesperocyparis nevadensis	PJW, oak woodland, Chap., CCCF	1B.2																																	
Layia heterotricha	CMWdld, JTW, VFGrs, alkaline and clay soils	1B.2																																	
Lupinus pusillus var. *intermontanus*	Great basin scrub, open, sandy areas	2.3																																	
Mentzelia eremophila	Canyons, rocky slopes and washes, roadsides, CBS	4.2	M	M	M	M	M	M	M	H	M	H	M	M	M	M	M				M	M	H	M	M										
Mentzelia tridentata	CBS, rock outcrops and washes	1B.3	M	M	M	M	M			M		M											M	M												
Mimulus pictus	Bare, sunny, shrubby areas, granite outcrops, forests, wdld	1B.2																																	
Mimulus shevockii	Alluvial fans, dry streamlets, generally on granitic soils	1B.2																																	
Monardella linoides ssp. *oblonga*	Chap, conifer wdld to forest, gravelly, dry slopes, flats	1B.3																																	
Muilla coronata	Open desert scrub, JTW, PJW	4.2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M	M	M	M	M	M		M		M		M
Navarretia setiloba	CMWdld, PJW, VFGrs, red clay, gravelly loam	1B.1																																	
Nemacladus gracilis	CMWdld, VFGrs, sandy or gravelly soil	4.3																																	
Orthotrichum shevockii	Underhangs of granitic rocks in LMCF, JTW	1B.3																																	
Pentachaeta fragilis	Grassy areas, chaparral, arid woodland, conifer forest	4.3																																	
Phacelia exilis	Sandy, rocky slopes, flats, Mdws; MCFrs, pebble plains	4.3																																	
Phacelia nashiana	Sandy to rocky, granitic east-facing slopes, JTW, PJW	1B.2	H	M	P	M	H					H		M	M			M	M	M	M	P	H	H	H	M		M	M		M				M
Ribes menziesii var. *ixoderme*	Chap., CMWdld, forest openings	1B.2																																	
Sclerocactus polyancistrus	Limestone hills, canyons, alluvial slopes; CBS, JTW	4.2	H	H	H	M	H		M	M	H	M	M				M	H		H	H	P	H	H	H										
Streptanthus cordatus var. *piutensis*	BUFRs, CCCF, PJW, Chap, cypress stands	1B.2																																	
Symphyotrichum defoliatum	Meadows, seeps, marshes; CSS, CMWdld, LMCF	1B.2																																	

WESTERN PARCELS			PARCEL GROUP AND PARCEL CODE																									
		Parcel Group	KELSO VALLEY																				LANDERS MDW.			CALIENTE CREEK		
		Parcel Code	K-01	K-02	K-03	K-04	K-05	K-06	K-07	K-08	K-09	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-01	L-02	L-03	C-01	C-02	C-04
	Notes: 1. Species in Appendix A considered "unlikely to occur" are not included here; 2. "Moderate"," high" and "present" are indicated; however, many species have low potential to occur throughout study area		153-080-02	153-080-08	153-070-03	153-070-02	153-080-05	153-080-04	153-070-07	153-030-05	153-100-03	153-090-01	153-090-03	153-100-13	153-100-10	153-090-05	153-051-03	153-120-02	153-120-04	153-110-01	153-110-03	153-120-07	153-012-03	153-012-05	153-012-07	442-020-20	442-010-10	442-030-01
Species	Habitat (1)	CNPS Rank																										
Allium shevockii	Metamorphic outcrops, talus, PJW, UMCF	1B.3								M				M			M	M							M			
Androsace elongata ssp. *acuta*	Mdws and seeps, many communities	4.2									M							M								H	H	H
California macrophylla	Clay flats, CMWdld, grasslands	1B.1																										
Calochortus palmeri var. *palmeri*	Mdws, vernally moist places, YPF, Chap	1B.1								H	P			H			H	H					P	P				
Calochortus striatus	Alkaline Mdws, moist CBS	1B.2													P				M			H						
Camissonia kernensis ssp. *kernensis*	Sandy slopes, flats, sagebrush scrub or JTW	4.3	M	H	H	H	H	H	H	M	H	H	H		H	H		M	M	H	H	M						
Canbya candida	JTW, MDS, sandy places	4.2	M	M	M	H	H	H	H		H	H	H		H	H		M	M	H	H	M						
Castilleja plagiotoma	Dry sagebrush scrub, pinyon woodland	4.3									M				P			M	H			H	P	P				
Chamaesyce vallis-mortae	MDS; dry, sandy places	4.2	P	P	H	P	H	H	H		H	H	M		P	P	H	P	P	H	H	P						
Chorizanthe spinosa	Sand or gravel	4.2																										
Clarkia xantiana ssp. *parviflora*	Chap, VFGrs, Cis Wdld, GBS, dry slopes, sandy or rocky	4.2	M	M	M	M					M							M					M	M	M			
Claytonia parviflora ssp. *grandiflora*	Vernally moist, often disturbed sites in CMWdld	4.2																								M	M	M
Cymopterus deserticola	Sandy soils, JTW, MDS	1B.2																										
Deinandra arida	Clay, volcanic tuff; washes, edge of springs, seeps, washes	1B.2																										
Deinandra mohavensis	Moist sites, openings in chaparral, desert scrub, wdld	1B.2	M								H			M				H										
Delphinium inopinum	UMCFrs, rock outcrops, metamorphic substrates	4.3								M							M								M			
Dudleya abramsii ssp. *calcicola*	Open, rocky, granite or limestone outcrops in Chap., PJW	4.3	M	M					M	M	M	M	M	M			M	M			M				M			
Eriastrum tracyi	Open areas, shale or alluvium, Chap or CMWdld	3.2							M	M		M				M	M	M		M	M	M				M	M	M
Eriogonum breedloveei var. *breedlovei*	PJW, UMCF; carbonate, quartzite	1B.2																					M	M	M			
Eschscholzia minutiflora ssp. *twisselmannii*	MDS, desert washes, flats slopes; tuff	1B.2																										
Fritillaria pinetorum	Shaded granitic slopes in chap, coniferous forest, PJW	4.3								M				M			M	M							M			
Hesperocyparis nevadensis	PJW, oak woodland, Chap., CCCF	1B.2																								M	M	M
Layia heterotricha	CMWdld, JTW, VFGrs, alkaline and clay soils	1B.2																				M						
Lupinus pusillus var. *intermontanus*	Great basin scrub, open, sandy areas	2.3				M	M				M	M								M								
Mentzelia eremophila	Canyons, rocky slopes and washes, roadsides, CBS	4.2																										
Mentzelia tridentata	CBS, rock outcrops and washes	1B.3																										
Mimulus pictus	Bare, sunny, shrubby areas, granite outcrops, forests, wdld	1B.2																								H	H	H
Mimulus shevockii	Alluvial fans, dry streamlets, generally on granitic soils	1B.2	H	H	M	M	H	H	M		P	H	M		H	P		H	M	H	H	M						
Monardella linoides ssp. *oblonga*	Chap, conifer wdld to forest, gravelly, dry slopes, flats	1B.3								M				M			M	M										
Muilla coronata	Open desert scrub, JTW, PJW	4.2	M	M	M	M	M	M	M		M	M			M	M			M	M	M	M						
Navarretia setiloba	CMWdld, PJW, VFGrs, red clay, gravelly loam	1B.1																								M	M	M
Nemacladus gracilis	CMWdld, VFGrs, sandy or gravelly soil	4.3																								H	H	H
Orthotrichum shevockii	Underhangs of granitic rocks in LMCF, JTW	1B.3																						H	H			
Pentachaeta fragilis	Grassy areas, chaparral, arid woodland, conifer forest	4.3								M							M	H		M	M	H	M	M	M	M	M	M
Phacelia exilis	Sandy, rocky slopes, flats, Mdws; MCFrs, pebble plains	4.3								M	M			M			M	M					M	M	M			
Phacelia nashiana	Sandy to rocky, granitic east-facing slopes, JTW, PJW	1B.2																										
Ribes menziesii var. *ixoderme*	Chap., CMWdld, forest openings	1B.2																								M		
Sclerocactus polyancistrus	Limestone hills, canyons, alluvial slopes; CBS, JTW	4.2																										
Streptanthus cordatus var. *piutensis*	BUFRs, CCCF, PJW, Chap, cypress stands	1B.2																								M		
Symphyotrichum defoliatum	Meadows, seeps, marshes; CSS, CMWdld, LMCF	1B.2																					P	P				

	Habitats (1) Abbreviations																																
	BUFRs = Broadleaved upland forests																																
	CBS = Creosote bush scrub																																
	CCCF = Closed-cone coniferous forest																																
	Chap = Chaparral																																
	CMWld = Cismontane woodland																																
	CSS = Coastal sage scrub																																
	JTW = Joshua tree woodland																																
	LMCF = Lower montane coniferous forests																																
	MCFrs = Montane coniferous forests																																
	MDS = Mojavean desert scrub																																
	Mdws = Meadows																																
	PJW = Pinyon and juniper woodland																																
	UMCFs = Upper montane coniferous forest																																
	VFGrs = Valley and foothill grasslands																																
	YPF = Yellow pine forest																																

***Androsace elongata ssp. acuta* (California androsace)**

California androsace has no state or federal status. Its CRPR is 4.2, meaning it is uncommon but fairly endangered in California. California androsace is an annual herb in the primrose family (Primulaceae). Only 2 to 8 cm in height, this slender, inconspicuous and early-flowering plant is easily overlooked. The hairy, pointed and tapered leaves are in a basal rosette; and flowers are borne in one or more peduncles, with hairy, red-tipped calyces that are longer than the inconspicuous white petals. California androsace flowers from February to May.

California androsace is found in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, pinyon and juniper woodland. Its microhabitat is meadows and seeps. Some records report it from north-facing slopes and clay substrate (CCH, 2012). It is reported as being highly localized. Its elevation range is 0-6,400 feet.

This species ranges from Oregon to Baja California. CNPS reports the species from 52 quadrangles in 19 counties, mostly west of the Sierra Nevada crest (CNPS, 2012). CCH (2012) reports 34 records from Kern County, in the Tehachapi Mountains, the Southern Sierra Nevada foothills, and the southern High Sierra Nevada. Specific localities are reported from Woolstaff Creek, Kern Canyon, Breckenridge Mountain Road, north of Tehachapi Pass, Oak Creek Canyon, Glennville, and Keene Station. These records are to the north, west and south of the survey area. The western portion of the survey area is likely to support this plant in areas of suitable habitat, particularly the Caliente Creek parcels (C-1 through -4). Less likely are the meadows and seeps in the higher western elevations of the Kelso Valley parcels (K-9 and -16), as these are higher in elevation and somewhat outside the known range for the species.

***Calochortus palmeri* var. *palmeri* (Palmer's mariposa-lily)**

Palmer's mariposa-lily has no state or federal status, but has a CRPR of 1B.2, meaning it is rare and endangered in California and is fairly endangered there. It is considered by both BLM Bakersfield and Ridgecrest field offices to be a sensitive species.

Palmer's mariposa-lily is a perennial herb in the lily family (Liliaceae). This plant grows to a height of 30 to 60 cm, with linear basal leaves that wither by flowering, and a branched flower stem bearing one to six erect, widely bell-shaped white to lavender flowers. The base of the petals may be brown-spotted, with a round nectary that is densely surrounded by knobby, yellow hairs. Flowering is from May to July.

This species is found in yellow pine forest and chaparral, in meadows, streamlets and vernally moist sites. The elevation range of known sites is 3,300 to 7,900 feet (CNPS, 2012).

Palmer's mariposa-lily is known from the mountains of Southern California, including the Inner Coast Range, Transverse Range, San Bernardino Mountains and southern Sierra Nevada, from Kern County south to San Bernardino County and west to San Luis Obispo and Los Angeles counties. CNPS reports the species from 81 occurrences on 41 quadrangles in 7 counties (CNPS, 2012). CNPS reports 29 of these occurrences from Kern County.

One record (CNDDB Occ. 10) is a non-specific locality reported by Twisselmann from Landers Meadow. Parcels L-1 and L-2 have extensive meadows and this species is assumed to be present on both. Another (CNDDB Occ. 66) is reported from the eastern slopes of the Piute Mountains in Esperanza Canyon, in the NE quarter of Section 18, adjacent to Parcel K-9. This site was visited on May 8, 2012 and the population verified. We also found a few plants within Parcel K-9 on a

gravelly flat adjacent to the drainage in Esperanza Canyon. These appeared to be outliers in drier habitat than is usually reported. Based on the presence of small streams and the likely presence of associated small meadows on many of the western parcels in Kelso Valley (Parcels K-8, K-12, K-15 and K-16), Palmer's mariposa-lily was deemed to have high potential to occur.

***Calochortus striatus* (Alkali mariposa-lily)**

Alkali mariposa-lily has no state or federal listing status, but has a CRPR of 1B.2, meaning it is rare, threatened or endangered in California and elsewhere, and endangered in California (CNPS, 2012). It is listed as sensitive by the BLM Bakersfield and Ridgecrest field offices (BLM, 2011).

This species is a perennial, bulb-forming member of the lily family (Liliaceae). As is typical for the genus, this species has a basal rosette of linear leaves that typically wither early. One to five flowers are borne in an umbel-like inflorescence. The flower is open and bell-shaped, with white to lavender petals and distinctive purple veins. Alkali mariposa-lily flowers from April to June.

This species is found in chaparral, chenopod scrub, Mojavean desert scrub, and meadows and seeps, in alkaline and usually clay soils in meadows and ephemeral drainages. Its reported elevation range is from 200 to 5,300 feet (CNPS, 2012).

Alkali mariposa-lily ranges from the southern San Joaquin Valley eastward through the southern Sierra Nevada and southward through the western Mojave Desert. It is reported from Tulare and Inyo counties through Los Angeles, Kern and San Bernardino counties. CNDDB reports more than 100 occurrences of this species (CNDDB, 2012b). There are several localities near and in the survey area; one record (CNDDB Occ. 35) is reported from Green Spring, in Parcel K-13 in Kelso Valley. Another (CNDDB Occ. 36) is a few miles southeast of Jawbone Canyon.

We visited the Green Spring locality in March, April and May 2012 but found no mariposa-lily. We also visited CNDDB Occurrence 36 (2 miles south of Ricardo, one-half mile west of Highway 14) in May, and no alkali mariposa-lily was found in this small but very distinctive patch of salt grass and rushes. This plant would be difficult to detect unless flowering, because its narrow, grass-like leaves would be obscured by the dense meadow vegetation. Based on the presence of extensive alkali meadow vegetation, this plant is likely to occur in other parcels in Kelso Valley (K-17 and K-20) as well as the known occurrence at Green Spring (K-13). Smaller areas of potentially suitable habitat were found in association with springs in the eastern acquisition area: at the spring at the upper end of Water Canyon in Parcel J-5 in Jawbone Canyon; at springs and seeps in Alphie Springs Canyon (Parcels A-4 and A-5); at the springs and seeps in the vicinity of Butterbredt Springs (Parcels B-9 and B-10); and areas in one parcel in the Dove Spring area (Parcel D-2).

***Camissonia kernensis* ssp. *kernensis* (Kern County evening-primrose)**

Kern County evening-primrose has no state or federal listing status, but has a CRPR of 4.3, meaning it is uncommon in California but not very endangered in California (CNPS, 2012).

This species is an herbaceous annual in the evening-primrose family (Onagraceae). It is a compact plant typically 5 to 15 cm in height with dense, spreading hairs on the stem and leaves. Narrow, slightly serrate leaves are clustered at the base of the plant. Flower petals are yellow, large (8 to 18 mm in length), and with large basal spots. Its flowering period is from March to May. Kern County evening-primrose is found in sagebrush scrub, Joshua tree woodland,

chaparral, and pinyon-juniper woodland, generally in sandy slopes and flats, often on granitic substrate. The elevation range for this species is 2,600 to 7,000 ft (CNPS, 2012).

Kern County evening-primrose is limited mostly to Kern County, although there are some records in Santa Barbara County. CCH has over 100 collection records for this species (CCH, 2012). Two occurrences are near the project area; one is in Esperanza Canyon, less than a quarter-mile west of Parcel K-9, while the other is on Harris Grade, about two miles north of Kelso Valley and three miles east-northeast of Landers Meadow (CCH, 2012). Although this species was not encountered during 2012 field surveys, habitat is suitable for this species in many of the parcels in the Kelso Valley, Butterbredt, upper Alphie Canyon and Dove Spring areas.

***Canbya candida* (White pygmy-poppy)**

White pygmy-poppy has no state or federal listing status, but has a CRPR of 4.2, a watch list (CNPS, 2012). White pygmy-poppy is a tiny herbaceous annual in the poppy family (Papaveraceae). Only 1-3 cm in height, this plant forms a tuft a few centimeters in diameter consisting of fleshy leaves surmounted by tiny white flowers, each on a single peduncle (stem). If flowers from April to May. White pygmy-poppy grows on gravelly and sandy soils formed over granite rock in Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland. Its known elevation range is 1,900 to 4,900 feet. Like many desert annuals, it can grow abundantly in years of above-average rainfall, and little or not at all during dry years.

White pygmy-poppy is known from the Mojave Desert from Inyo County south to San Bernardino and Los Angeles counties. In Kern County in the vicinity of the project this species has been reported from Dove Spring Canyon and 9 miles north of Ricardo, and from a number of locations in the North Sky River Wind Farm near Jawbone Canyon Road as it descends into Kelso Valley, apparently near some of the Kelso Valley parcels.

Suitable granitic soil habitat for white pygmy-poppy was observed in some parcels in the Jawbone Canyon, Sugarloaf, Dove Spring, and upper Alphie Canyon areas, and in many parcels in the Butterbredt and Kelso Valley areas. Although it was not observed in 2012, it is likely to appear in years of above-average precipitation.

***Castilleja plagiotoma* (Mojave paintbrush)**

Mojave paintbrush has no state or federal listing status, but has a CRPR of 4.3, a watch list (CNPS, 2012). Mojave paintbrush is an herbaceous perennial in the broomrape family (Orobanchaceae; formerly in the snapdragon family, Scrophulariaceae), a family of parasitic and partially parasitic plants. This gray-green, short-hairy plant reaches 30 to 60 cm in height, often becoming dark reddish with age. The flowers and bracts are white-woolly and yellow in color, blooming from April to June. Mojave paintbrush grows in dry sagebrush scrub and pinyon woodland at elevations from 950 to 8,200 feet.

Mojave paintbrush grows in the Mojave Desert and coastal ranges from Fresno and San Benito counties southward to Riverside and San Bernardino counties and coastward to San Luis Obispo and Ventura counties (CCH, 2012). In Kern County, the species is known from Oak Canyon west of Mojave, north of Highway 58 near Sand Canyon. In the vicinity of the project area, it was observed in the North Sky River Wind Farm and it is reported from Landers Meadow (CCH, 2012).

This species was therefore assumed to be present in Parcels L-1 and L-2 in Landers Meadow, where extensive areas of suitable habitat are present. It was observed near Green Spring in Kelso Valley, on Parcel K-13. Several hundred plants were found growing under and through rubber rabbitbrush at the margins of alkaline meadows dominated by rushes. Similar habitat was observed in Parcels K-9, K-16, K-17 and K-20, where it was considered likely to occur.

***Chamaesyce vallis-mortae* (Death Valley sandmat)**

Death Valley sandmat has no state or federal listing status, and its CRPR 4.2, a watch list (CNPS, 2012). It is a prostrate perennial herb in the spurge family (Euphorbiaceae). It is distinctive in being white-tomentose, with yellow-green involucral glands and white appendages. This plant flowers from May through December. Death Valley sandmat is found in Mojavean Desert scrub, in sandy or gravelly places. Its elevation range is below 4,800 feet (CNPS, 2012).

Death Valley sandmat is limited to the western Mojave Desert, in Inyo, Kern and San Bernardino counties, from the vicinity of Owens Lake to northeast of Barstow. There are several records from the close vicinity of the project area, including Red Rock Canyon, Kelso Valley, Kelso Creek, the Jawbone area, near Dove Spring and Dove Well (CCH, 2012).

In May 2012, we mapped Death Valley sandmat in seven parcels in Kelso Valley (K-1, K-2, K-4, K-13, K-16, K-17, and K-20), two in Butterbredt Canyon (B-9 and B-10), three in Alphie Canyon (A-4, A-6 and A-7), one in Dove Spring (D-4), and one parcel in the Sugarloaf area (S-1). It is likely to occur in nearly all of the lower-elevation Kelso Valley parcels and all of the parcels in the eastern acquisition area.

***Chorizanthe spinosa* (Mojave spineflower)**

Mojave spineflower has no state or federal listing status, but has a CRPR of 4.2, a watch list (CNPS, 2012). This is an herbaceous annual plant in the buckwheat family (Polygonaceae). It is prostrate, generally less than 10 cm in height, and spreading to 80 cm under favorable conditions. Leaves are tomentose on the underside. The involucres are 4 to 5-toothed or ribbed and the involucral awns are long, stiff, and straight. The awns are so thick that previous year's growth persists over the winter and can be seen as a skeleton the next year. The flowering period for Mojave spineflower is April through July. Its habitat is Mojavean Desert scrub, in sandy or gravelly places. Its elevation range is from 50 to 4,800 feet (CNPS, 2012; CNDDB, 2012b).

Most Mojave spineflower is reported from Kern, Los Angeles and San Bernardino counties, although CCH reports some records from western Fresno County as well. CCH also reports 11 localities from Red Rock Canyon State Park, mainly east of Highway 14 (CCH, 2012). We observed Mojave spineflower in several locations within Parcel S-6. In many instances, the previous year's skeletons of Mohave spineflower were the first indication of the population, and the 2012 plants were both smaller and less numerous. The plants were most often seen on lower bajada slopes near small drainages, on fine-textured soils with a gravelly surface. The soils in these areas were mapped as Cutterbank association, soils formed from granitic alluvium in former lakebeds. Suitable habitat appeared to be present in a number of the eastern parcels with Cutterbank soils (Parcels J-2, J-4 and J-5 and S-1 through S-5).

***Clarkia xantiana* ssp. *parviflora* (Kern Canyon clarkia)**

Kern Canyon clarkia has no state or federal listing status, but has a CRPR of 4.2, a watch list (CNPS, 2012). It is an annual herb in the evening-primrose family (Onagraceae). It is a slender,

erect plant, growing to 80 cm in height with reflexed buds, lavender to red-purple, lobed and clawed petals 6 to 12 mm in length. The stigma does not exceed the anthers. Kern Canyon clarkia flowers from May to June. This species is found in chaparral, valley and foothill grassland, cismontane woodland and Great Basin scrub on sparsely vegetated dry slopes in sandy and rocky substrates with varying exposures. The elevation range for the species is reported variously as 2,400 to over 11,000 feet (CNDDB, 2012b) but most records in Kern County are below 5,000 feet (CCH, 2012).

Kern Canyon clarkia is reported from about 20 to 30 localities in Kern, Tulare, Inyo and Los Angeles counties, with most occurrences centered on the Kern River Canyon and its tributaries. The nearest record to the survey area is on Piute Mountain Road about 3.5 miles west of Kelso Valley Road. This record is near the Landers Meadow parcels and those in Kelso Valley, and is located in habitat similar to many of the parcels in this area. This species was considered to have a moderate potential to occur in the more northern of the Kelso Valley parcels and the Landers Meadow parcels, all which are slightly out of the known range for the species.

***Claytonia parviflora* ssp. *grandiflora* (Streambank spring beauty)**

Streambank spring beauty has no state or federal listing status, but has a CRPR of 4.2, a watch list (CNPS, 2012). This is an annual herb in the miner's lettuce family (Montiaceae, formerly within the Portulacaceae). It is a small plant, spreading to erect, 1 to 30 cm in height. The basal leaves are narrow, and the cauline (stem) leaves may be fused into a disk. The flowers are 4 to 6 mm in long, white or light pink and the seeds are smooth and shiny with a white appendage. Its flowering period is May to July.

As the name suggests, streambank spring beauty grows in vernally moist, rocky, often disturbed sites in cismontane woodlands (Baldwin et al., 2012). Its elevation range is reported variously as from 500 to 4,800 feet.

Streambank spring beauty is a plant of the Sierra foothills, ranging from Butte County in the north to Kern County in the south. Most records are in the mid-Sierra, with a few outlying records in the desert mountains such as the Panamint, Granite, and Nelson ranges. CNPS reports occurrences from 30 quadrangles (CNPS, 2012). The Caliente Creek parcels are near the southern end of the species' range; one locality, reported from the hillsides of Caliente Canyon, notes poetically that the species, when flowering, covered the hillsides, giving the appearance of light snowfall (CCH, 2012). Another record by Mary DeDecker is described as Aqueduct Road near Water Canyon. This record is in an area lacking cismontane woodland and has very limited vernally moist habitat. Thus, the parcels with greatest potential to support this species are the Caliente Creek parcels (C-1 through -4), although Parcel J-5 which includes Water Canyon was also considered to have moderate potential to support this species.

***Cymopterus deserticola* (Desert cymopterus)**

Desert cymopterus has no state or federal status, but has a CRPR of 1B.2, meaning it is rare, threatened or endangered in California and elsewhere, and fairly endangered in California (CNPS, 2012). It is considered a Sensitive species by the BLM Ridgecrest field office (BLM, 2011). It is a perennial herb in the carrot family (Apiaceae). Desert cymopterus is a low-growing, glabrous plant with pinnately dissected leaves and dark purple flowers in dense heads. It flowers from March to May. Desert cymopterus is found in fine to coarse, loose sandy soils of old dunes in Joshua tree woodland and Mojavean desert scrub. The elevation range for the species is 2,000 to 5,000 feet.

Desert cymopterus is found in the western Mojave Desert from Kern, Los Angeles and San Bernardino counties. CNDDB reports a total of 79 occurrences for the species (CNDDB, 2012b). Most records are in the vicinity of Edwards Air Force Base in Kern County. The nearest records to the project area are in the vicinity of California City and Cuddeback Dry Lake.

Since the project area is almost 20 miles north or west of the nearest known records, an observation of desert cymopterus in Parcel A-3 was unexpected. One colony consisting of 25 individuals in vegetative condition was observed in April 2012, identified by Denise LaBerteaux, a botanist familiar with the species and the genus. We returned to look for flowering individuals in May 2012, but the plants seen earlier had been grazed to the ground. Because this was a range extension of the known range and a small population, this species was judged to have only moderate potential to occur elsewhere in loose, sandy soils in the eastern acquisition area parcels. The most likely suitable habitat was observed in Jawbone Canyon Parcel J-5, Sugarloaf Parcel S-3, and Alphie Canyon A-7.

***Deinandra arida* (Red Rock tarplant)**

Red Rock tarplant is state-listed as rare and has a CRPR of 1B.2, meaning it is rare, threatened and endangered in California and elsewhere and is fairly threatened in California (CNPS, 2012). It is listed by the BLM Ridgecrest field office as a sensitive species (BLM, 2011). Red Rock tarplant is an annual herb in the sunflower family (Asteraceae). It is an erect, glandular plant typically growing to 20 to 80 cm in height. Its leaves are toothed to entire, bristly-hairy and glandular. The yellow flower heads are grouped in branched panicles, the bracts below the head not overlapping the involucre, the phyllaries both hairy and glandular. The disk flowers generally have no pappus. Red Rock tarplant flowers from April to November. This species is found Mojavean desert scrub in washes and canyon slopes at the edges of springs and seeps, and typically on clay or volcanic tuff. The elevation range for the species is 1,000 to 3,300 feet.

Red Rock tarplant is restricted to a small area in Kern County centered on Red Rock Canyon. CNDDB lists six occurrences for the species, and CNPS lists occurrences in four quadrangles (CNDDB, 2012b; CNPS, 2012). Most records are in Red Rock Canyon itself, but some records are in Cudahy Creek and Last Chance Canyon nearby (CNDDB, 2012b). The records along Highway 14 are all one to two miles east of the project area. We visited several localities in April and May 2012, all apparently a part of CNDDB Occurrence 1. Compared with past records the plants were fewer in number and flowering relatively early in the season.

Although volcanic tuff substrate is generally not found in the survey area, seeps and springs in fine-textured soil of the Cutterbank Association are present in several parcels in the Sugarloaf and Jawbone areas. These were considered to have moderate potential to support Red Rock tarplant, although none was found in April and May 2012. Other parcels with seeps and springs in the Alphie Canyon and Butterbredt areas were concluded to have low potential to support this species.

***Deinandra mohavensis* (Mojave tarplant)**

Mojave tarplant is state-listed as endangered but has no federal listing status with USFWS. It has a CRPR of 1B.3, meaning it is rare, threatened or endangered in California and elsewhere; not very endangered in California (CNPS, 2012). The BLM Ridgecrest field office lists it as a Sensitive species (BLM, 2011). Mohave tarplant is an herbaceous annual in the sunflower family (Asteraceae). It typically grows from 10 cm to 1 m in height, with leaves entire to serrate, hairy

and stalked-glandular. The yellow flower heads consisting of five ray flowers and numerous disk flowers are generally in tight groups or in crowded, sometimes open panicle-like clusters. The pappus consists of five to nine irregularly shaped scales 0.1 to 0.9 mm in length. Mojave tarplant flowers from May through January. This species is found in chaparral, desert scrub, desert riparian habitat, and woodland. It is described as occurring in moist sites, on low sand bars in river beds, mostly in riparian areas or grassy areas associated with stream or wash habitats. The known elevation range for the species is from 1,500 to 5,300 feet.

Mojave tarplant is known from the western Mojave Desert and San Jacinto Mountains in Kern, Inyo, Riverside, San Bernardino, and San Diego counties. The records nearest the project area include two records from Water Canyon and Esperanza Canyon (CNDDB occs. 67 and 68) in the section just west of Parcel K-9; from the North Sky River wind farm project in the southern end of Kelso Valley (CNDDB Occ. 72), less than two miles south of the project parcels; and a record from a side canyon of Jawbone Canyon near Blue Point (CNDDB Occ. 32). The latter locality was checked in March, April and May 2012 but no evidence of vegetative or flowering tarplant was found in the suitable habitat there.

Potentially suitable habitat could be present in a number of parcels on the west side of Kelso Valley, in parcels with seeps and springs in the Jawbone, Dove Spring, Alphie Canyon, and Butterbredt areas.

***Delphinium inopinum* (Unexpected larkspur)**

Unexpected larkspur has no state or federal status and has a CRPR of 4.3, meaning it is uncommon and not very endangered in California. It is a perennial herb in the buttercup family (Ranunculaceae). This plant is tall (up to 1-1.5 m), glabrous and glaucous, with leaves on the lower portion of the stem during flowering. The numerous white to light blue flowers are borne on a tall stem, the sepals pointing forward and the spur 9 to 12 mm in length. Unexpected larkspur is generally reported as flowering in summer rather than spring; it is reported variously as flowering from May to August (CNPS, 2012, Baldwin et al., 2012).

Unexpected larkspur is reported from upper montane conifer forest in rock outcrops of metamorphic and limestone in red fir and western white pine forest (CNPS, 2012; CNDDB, 2012b), although some occurrences are reported on granite substrate in pinyon woodland (CNDDB Occ. 36). The elevation range for the species is from 6,000 to 9,800 feet (CNDDB, 2012b).

This species is found in the southern Sierra Nevada, Piute Mountains and Mt. Pinos, in Fresno, Inyo, Tulare, Kern, and Ventura counties. CNPS has 30 occurrence records in 13 quadrangles (CNPS, 2012). The nearest records to the project site are on the north side of Piute Peak, about five miles west of Landers Meadow, and several records in the vicinity of Alaska Flat, about five miles northwest of Landers Meadow. The lower elevation, and lack of red fir and western white pine forest reduce the likelihood of occurrence of this species except at Landers Meadow, and possibly on the higher elevation parcels in the Kelso Valley area.

***Dudleya abramsii* ssp. *calcicola* (Limestone dudleya)**

Limestone dudleya has no state or federal status and has a CRPR of 4.3, meaning it is uncommon and not very endangered in California. It is a perennial herb in the stonecrop family (Crassulaceae). This plant has one to many basal rosettes of oblong to lanceolate or subcylindric,

fleshy leaves, and often-branched flower stalks with pale yellow flowers with keels darker yellow or red-tinged (Baldwin et al., 2012). Limestone dudleya flowers from April to August. This species grows in chaparral and pinyon and juniper woodland, on open, rocky outcrops that are often carbonate but sometimes granite. The known elevation range for limestone dudleya is 1,600 to 8,500 feet.

Limestone dudleya is known from the southern Sierra Nevada, in Inyo, Tulare and Kern counties. Several records have been reported from the vicinity of the project area; one is apparently from Jawbone Canyon near the California Aqueduct crossing in or near Parcel J-3 (SD99581); another is just south of Blue Point; a third (RSA617755) is less than a mile from Parcels S-4 and S-5 (CCH, 2012). These are most likely on granitic rather than calcareous substrate. Although none of these localities were verified during field surveys, the potential is high for this species to occur on many parcels in the Jawbone, Sugarloaf, Dove Spring, Alphie Canyon, Butterbredt, Kelso Valley, and Landers Meadow areas.

***Eriastrum tracyi* (Tracy's eriastrum)**

Tracy's eriastrum is state-listed as rare, but has no federal status. Its CRPR was recently reduced to 3.2, meaning its status needs review but it is fairly endangered in California. This species is a small (to 22 cm), slender, tufted-woolly-hairy plant with awl-shaped, narrowly lobed leaves, trumpet-shaped, white to purple flowers with a yellow throat. It flowers from May to August. Tracy's eriastrum is found in chaparral or cismontane woodland in open areas on gravelly clay shale or alluvium, and apparently is found in sites with at least a moderate degree of disturbance. The reported elevation range for the species is from 1,300 to 3,300 feet.

Tracy's eriastrum has a disjunct distribution, with records in the North Coast Ranges in Shasta, Trinity, Colusa, Glenn, Tehama, and Santa Clara counties, as well as in Fresno and Kern counties. CNPS and CNDDB each have 46 occurrence records for the species (CNPS, 2012; CNDDB, 2012b). Fourteen occurrences on the Cross Mountain and Emerald Mountain quadrangles were initially reported by GANDA (2010) as part of the North Sky River project. One occurrence was reported about a mile southeast of Schoolhouse Well (Parcel K-20) in blackbrush scrub and Joshua tree woodland. In 2012 surveys we found five other species of eriastrum, such as *Eriastrum signatum, E. sapphirinum, E. pluriflorum*, and others, but did not encounter any populations of Tracy's eriastrum. The blackbrush and pinyon-juniper woodland habitat in some parcels in Kelso Valley and possibly the chaparral in the Caliente Creek parcels resemble that reported by GANDA (2010) for this species, although none of the soils in the EKCA project area are derived from sedimentary shale. As such, Tracy's eriastrum was considered to have moderate potential to occur in the Caliente Creek parcels, and limited potential to occur in some parcels in the southern part of Kelso Valley.

***Eriogonum breedlovei* var. *breedlovei* Breedlove's buckwheat**

Breedlove's buckwheat has no state or federal status, but is ranked as CRPR 1B.2, meaning it is rare and endangered in California and is fairly endangered there. Breedlove's buckwheat is a perennial, mat-forming herb in the buckwheat family (Polygonaceae). Growing to 10 cm in height and 15 to 20 cm in diameter, this plant is glandular-hairy, with tomentose leaves, erect to spreading glandular peduncles, and white to red perianth parts obovate in outline. This plant flowers from June to September. Breedlove's buckwheat grows in pinyon and juniper woodland and upper montane coniferous forest, reportedly on quartzite and carbonate. Some records report it from black metamorphic rock surrounded by Jeffrey pine and white fir forest, but most are from dolomite or carbonate substrates. The elevation range for the species is 7,500 to 8,200 feet.

Breedlove's buckwheat is restricted to Kern County, where it is known only from only 10 localities on four adjoining quadrangles, including the Claraville quadrangle. The nearest record to the project area is at French Meadow, about three miles west-northwest of Landers Meadow. Although the habitat features of the Landers Meadow only partially match the typical characteristics of the reported occurrences, this species was considered to have moderate potential to occur in the Landers Meadow parcels.

***Eschscholzia minutiflora* ssp. *twisselmannii* (Red Rock poppy)**

Red Rock poppy has no state or federal status, but is ranked as CRPR 1B.2, meaning it is rare and endangered in California and is fairly endangered there. It is considered by BLM to be a sensitive species. This is an annual herb in the poppy family (Papaveraceae). Although this subspecies is not recognized in the second edition of the *Jepson Manual* (Baldwin et al., 2012), it continues to be recognized by CNPS and CNDDB. Red Rock poppy is relatively small (5 to 25 cm), glaucous and glabrous plant with a basal rosette of narrowly divided leaves and yellow flowers, sometimes orange-spotted at the base, petals 10 to 26 mm in length. The rim at the base of the hypanthium is small, 0 to 0.3 mm. This species flowers from March to May. It is found in Mojavean desert scrub on volcanic tuff substrate, although it sometimes is reported as occurring on decomposed granite (CNDDB, 2012B). The known elevation range for the species is below 8,500 feet.

Red Rock poppy is known only from Kern County, with nearly all records from the Rand and El Paso mountains to the east of the survey area. Out of 26 records on file with CNDDB, only one, a record from Edwards Air Force Base, is outside of this area. Although neither CNPS nor CNDDB report any occurrences from the quadrangles on which the project is located, CCH reports a single locality from Jawbone Canyon, about 1.5 miles west of Highway 14 (RSA445460).

The project team visited the large Mesquite Springs locality (CNDDB Occ. 28) monthly in March, April and May, 2012; no plants were observed during this dry year. Although the project area contains little if any volcanic tuff habitat, this species occasionally is reported from other substrates. Therefore, it was concluded that outliers could potentially be found in the EKCA parcels nearest the known distribution of the species and having soils formed from fine-textured lakebed sediments: the Sugarloaf parcels, and perhaps in the Jawbone parcels J-4 and J-5 as well.

***Fritillaria pinetorum* (Pine fritillary)**

Pine fritillary has no state or federal status and has a CRPR of 4.3, meaning it is uncommon and not very endangered in California. This is a perennial plant in the lily family (Liliaceae). Plants are 10 to 40 cm tall, with fewer than 10 leaves and the spreading to erect flowers purple mottled with green-yellow. Pine fritillary flowers relatively late for the genus, from May to September. It is found in chaparral, lower montane coniferous forest, pinyon and juniper woodland, subalpine coniferous forest, and upper montane coniferous forest on shaded granitic or metamorphic slopes. The elevation range for the species is from 5,900 to 10,500 feet.

Pine fritillary is found in the Sierra Nevada, Mt. Pinos, and Transverse Ranges from Tuolumne and Mono counties south to Los Angeles and San Bernardino counties. Although occurrences are not common in the Piute Mountains, CCH (2012) reports an occurrence from the Saddle Springs Campground, several miles west of Kelso Valley and Landers Meadow. This species could occur in Landers Meadow and the higher elevations of the western Kelso Valley parcels.

***Hesperocyparis nevadensis* (Piute cypress)**

Piute cypress has no state or federal status, but it has a CRPR of 1B.2, meaning it is rare and endangered in California and is fairly endangered there. It is considered by BLM to be a sensitive species. Piute cypress is in the cypress family (Cupressaceae). It is a narrow tree with fibrous gray to red bark, resinous, scale-like leaves forming cylindrical branchlets more than 1 mm in diameter, and ovoid cones 20 to 35 mm in diameter, with 6 to 8 scales. This species is found in pinyon and juniper woodland, oak-pine woodland, chaparral, and closed-cone conifer forest, often forming small monotypic (single-species) stands on rocky slopes. It has been reported from granodiorite, gabbro and limestone substrates at elevations from 2,400 to 5.900 feet.

CNDDB and CNPS report Piute cypress only from Tulare and Kern counties in the southern Sierra Nevada, Greenhorn, and Piute Mountains, although CCH has additional localities from Fresno, Los Angeles, San Bernardino and San Diego counties. Most records are from Kern County. Some populations were reported in the North Sky River Wind Farm project, and an older record was reported from Back Canyon, about two miles from Parcel C-4 in the Caliente Creek area. Since the species forms small colonies, some undiscovered populations could exist in the granitoid substrates in the rugged back country of the Caliente Creek parcels.

***Layia heterotricha* (Pale yellow layia)**

Pale yellow layia has no state or federal status, but is ranked as CRPR 1B.2, meaning it is rare and endangered in California and is fairly endangered there. It is considered by BLM to be a sensitive species. It is an annual herb in the sunflower family (Asteraceae). It can be moderately tall, growing from 15 up to 90 cm in height, with a stout, hollow, purple-streaked stem, and is glandular with an apple or banana scent. Leaves are clasping and entire to coarsely toothed. The flower heads are large and the ray flowers white to cream-colored. The disk pappus is absent. This plant flowers from March to June (CNDDB, 2012b, Baldwin et al., 2012). Pale yellow layia is found in cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland in open areas on clay and often alkaline soils. The known elevation range for the species is from 900 to 5,600 feet (CNPS, 2012; CNDDB, 2012b).

Pale yellow layia is known from many localities in the Inner and Outer Coast Ranges and foothills of the southern Sierra Nevada, Tehachapis, and even the western Mojave, but generally appears only in years with above-average rainfall. CNPS reports its distribution from Monterey and San Benito counties southward to Los Angeles and Kern counties. Although CNPS reports one record from Freeman Junction, most of the records near the project area are in the Tehachapi Mountains near Monolith and Sand Canyon and Mojave. The Caliente Creek parcels are within the typical range of the species; however, soils data indicate that the substrate for most of the area is granitoid rock and gneiss. These are unlikely to develop the alkaline clay that comprises suitable habitat for this species. Kelso Valley Parcel K-20 has relatively high clay and somewhat alkaline soils and pale yellow layia could occur there. If present, this species would be expected to appear only in the highest rainfall years.

***Lupinus pusillus* var. *intermontanus* (Intermontane lupine)**

Intermontane lupine has no state or federal status, but is ranked as CRPR 2.3, meaning it is rare, threatened or endangered in California but more common elsewhere, and is not very endangered in California. It is an annual herb in the pea family (Fabaceae). As the species name suggests, this is a small plant, 5 to 12 cm in height, hairy, with leaves consisting of 5 to 6 small leaflets crowded near the base. The flowers are spiraled, with the petals pale blue fading to pink or white,

with a yellow spot on the banner. Intermontane lupine is found in Great Basin scrub, in open, sandy areas. The elevation range for the species is from 4,000 to 5,300 feet.

As the varietal name indicates, intermontane lupine is known from the western United States, from Washington and Montana south to Arizona and California. The California records are from the eastern part of the state, from Modoc County to Inyo County (CNDDB, 2012b), although CNPS reports the species from the desert mountains near Death Valley. CCH (2012) reports one record from Kelso Valley, although this is an old record and may be questionable. If present, intermontane lupine would most likely be found in the higher elevations in the Kelso Valley parcels where sagebrush scrub was reported.

***Mentzelia eremophila* (Solitary blazing star)**

Solitary blazing star has no state or federal status, but is ranked as CRPR 4.2, meaning it is uncommon but fairly endangered in California. This is an annual herb in the blazing star family (Loasaceae). This species is erect, glabrous to hairy, with entire, green bracts and large yellow petals 12 to 24 mm long. It flowers from March to May. Solitary blazing star is found in creosote bush scrub, in canyons, rocky slopes and washes as well as roadsides. The elevation range for the species is from 1,900 to 4,100 feet.

Solitary blazing star is reported from Inyo, Kern and San Bernardino counties, although most records are from Kern County in the general vicinity of Red Rock Canyon. CNPS has no records from the quadrangles including the project area, but CCH has several, including a record about two miles west-southwest of Blue Point (RSA 440298), one about a mile south of the junction of Jawbone Canyon and Highway 14 (RSA440396), one about two miles east of Parcel 58 (RSA440399) and numerous records along Highway 14 in Red Rock Canyon, a mile or two east of the Sugarloaf parcels. We observed a single individual solitary blazing star in the wash of Red Rock Canyon in April 2012, but it had disappeared and we found no others when revisiting the site in May 2012. Rocky slopes and washes are relatively common in the Sugarloaf and Jawbone areas and we concluded that this species has moderate to high potential to occur in many of these parcels.

***Mentzelia tridentata* (Creamy blazing star)**

Creamy blazing star has no state or federal listing status, but it is a CRPR 1B.3 plant, indicating that it is rare, threatened, or endangered in California and elsewhere, but not very endangered in California (CNPS, 2012). This is an annual herb in the blazing star family (Loasaceae). This is a small (5 to 25 cm tall), erect, hairy plant with wavy to toothed leaves, white to pale yellow petals 1 to 4 cm long and widely obovate with a narrow, pointed tip, the bracts are green, and the fruit is 9 to 18 mm long. The filaments are broadened and two-lobed at the end with stamens borne on a narrow stalk between the lobes. Creamy blazing star flowers from April to May. It is found in Mojavean desert scrub, reportedly on dry, rocky slopes, at the edge of washes, on rocky granite slopes, volcanic gravel, and various eastern, southern and western exposures. The elevation range for the species is 2,300 to 4,300 feet.

Creamy blazing star is found in the Mojave Desert from Inyo County southward to Imperial and San Diego counties. Most of the 25 CNDDB records are from western San Bernardino County. The record nearest the project area is from the mud hills of Red Rock Canyon (CNDDB Occ. 9), but it is noted that this is out of range and should be checked. The next nearest records are from Little Lake in Inyo County and from Hinkley and eastward (CCH, 2012; CNDDB, 2012b). Rocky

granite washes in creosote bush scrub are present in parts of the Jawbone, Sugarloaf and Alphie Canyon areas, so outliers have moderate potential to occur there.

***Mimulus pictus* (Calico monkeyflower)**

Calico monkeyflower has no state or federal status, but is ranked as CRPR 1B.2, meaning it is rare and endangered in California and is fairly endangered there. It is considered by the BLM Bakersfield Resource Area to be a sensitive species. This is an annual herb formerly in the snapdragon family (Scrophulariaceae) but now assigned to the lopseed family (Phrymaceae). This is a small to medium-sized hairy plant, 2 to 38 cm in height, with square stems. The flowers are white with a distinctive pattern of purple-brown veins. Calico monkeyflower flowers from March to May and is found in broadleafed upland forest and cismontane woodland in bare, sunny and shrubby areas at the base of granite outcrops. The elevation range for the species is from 300 to 4,300 feet.

Calico monkeyflower is known from Tulare and primarily Kern counties on the west side of the Sierra Nevada and the Tehachapis from near Visalia to the Tejon Ranch. The record nearest the project area is from near Stephenson Peak (CNDDB Occ. 38), about 3 miles south of Parcel C-4; and more distant records are from Keene Station and the grade to Walker Basin. Granite outcrops and potentially suitable habitat appear to be present on Caliente Creek parcels C-1 through C-4, and this species was considered to have high potential to occur there.

***Mimulus shevockii* (Kelso Creek monkeyflower)**

Kelso Creek monkeyflower has no state or federal status, but is ranked as CRPR 1B.2, meaning it is rare and endangered in California and is fairly endangered there. It is considered by both BLM Bakersfield and Ridgecrest Resource areas to be a sensitive species (BLM, 2011). This is an annual herb formerly in the snapdragon family (Scrophulariaceae) but now assigned to the lopseed family (Phrymaceae). Kelso Creek monkeyflower is 2 to 12 cm in height, minutely puberulent, with clasping and sometimes fused stem leaves. The flowers are distinctively bicolored, with the upper lip maroon and the lower lip yellow with maroon dots. This species flowers from March to May, depending on conditions. It is found in Joshua tree woodland and pinyon and juniper woodland, in loose, granitic, sandy soil. The elevation range for the species is from 2,900 to 4,300 feet.

This species is endemic to Kern County, with a known range from six quadrangles extending from Lake Isabella to Pinyon Mountain and Claraville. CNDDB has two occurrence records (occs. 12 and 13) from Kelso Valley, one in Parcel K-14 on the east side of Kelso Valley, and one just west of Parcel K-9. We looked for Kelso Creek monkeyflower in May 2012 at Occurrence 12, but found no sign of it. This is evidently a flower that appears early, briefly, or not at all in unfavorable years. CNDDB notes for Occurrence 12 suggest that all of Kelso Valley should be surveyed in a good year for additional occurrences. Many parcels in Kelso Valley were considered to have high potential to support this species.

***Monardella linoides* ssp. *oblonga* (Tehachapi monardella)**

Tehachapi monardella has no state or federal listing status, but it is a CRPR 1B.3 plant, indicating that it is rare, threatened, or endangered in California and elsewhere, but not very endangered in California (CNPS, 2012). It is designed by the BLM Ridgecrest Resource Area as a special-status species (BLM, 2011). This is a perennial rhizomatous herb in the mint family (Lamiaceae). It has silvery to ash-gray, narrow leaves, and bracted heads of whitish, lavender or pale purple flowers.

It flowers from June to August. Its habitat is lower montane coniferous forest, upper montane coniferous forest, and pinyon and juniper woodland, where it is found on dry, gravelly slopes and flats. Its elevation range is from 4,900 to 8,500 feet.

Tehachapi monardella is found in Kern, Tulare and Ventura counties, mainly on the western side of the Sierra Nevada, but with some records on the eastern side of the Tehachapis. There records nearest the project area are from the Cache Peak quadrangle (CNDDB occs. 54 and 55) at the north end of Sweet Ridge as part of the North Sky River Wind Farm project. The project area is slightly outside of the known range for the species, although the habitat in the upper elevations of the Kelso Valley parcels may be suitable. We observed only *Monardella linoides* ssp. *linoides* during field surveys in 2012.

***Muilla coronata* (Crowned muilla)**

Crowned muilla has no state or federal status and has a CRPR of 4.2, meaning it is uncommon but fairly endangered in California. It is a bulb-forming perennial herb, formerly in the lily family (Liliaceae) but now assigned to the brodiaea family (Themidaceae). This small species has a flowering stem 3 to 5 cm high with two to ten flowers on pedicels 1 to 3 cm long. The perianth lobes are white or light blue, with a green midvein on the back. The filaments are dilated with free but wide overlapping margins. Crowned muilla flowers from March to May. It is found on barren flats and ridges on sandy, granitic soils in Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland. Its elevation range is 3,200 to 5,300 feet.

Crowned muilla is found primarily on the eastern side of the Sierra Nevada, from Inyo and Tulare counties southward to Los Angeles, Kern, and San Bernardino counties, and eastward to Nevada. The records nearest the project area are on the Weldon and Freeman Junction quadrangles, more than 10 miles north of the project area (CNPS, 2012). CCH has one record from Redrock Randsburg Road, about 10 miles east of the project area. This is a species that flowers briefly and may be difficult to detect in the seasons and years when it does not flower. Further, it may be subject to intense herbivory in dry years such as 2012. There is potential for this species to occur in very low density throughout the project area.

***Navarretia setiloba* (Piute Mountains navarretia)**

Piute Mountains navarretia has no state or federal status and has a CRPR of 1B.1, meaning it is rare, threatened or endangered in California and seriously endangered in California (CNPS, 2012). The BLM Bakersfield Resource Area office lists it as a sensitive plant (BLM, 2011). It is an annual herb in the phlox family (Polemoniaceae). It flowers from April to July. This species is found in cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland in red clay or gravelly loam. The elevation range for the species is 1,000 to 3,700 feet.

Pine Mountains navarretia is known only from Kern, Tulare and Los Angeles counties, primarily on the west side of Piute Mountain. It is known from only 22 localities (CNDDB, 2012b). The nearest records are between Caliente and Walker Basin, about 12 miles west of the Caliente Creek parcels. Suitable habitat may be present for this species in the Caliente Creek parcels.

Nemacladus gracilis (Slender threadplant)

Slender threadplant has no state or federal status and has a CRPR of 4.3, meaning it is uncommon and not very endangered in California. It is an annual herb in the bellflower family

(Campanulaceae). This is a small and slender plant, 2.5 to 10 cm tall, with tiny, spoon-shaped and slightly toothed leaves. The inflorescence axis is straight or weakly zigzag, the pedicels are S-curved, the anthers are 0.5 mm in length, and the corolla is white or pale lavender, with the midvein on the lobes sometimes pink, lavender or maroon, but otherwise without darker marks. Slender threadplant flowers from March to May. In dry years it likely appears in limited abundance or not at all. Slender threadplant is found in cismontane woodland, valley and foothill grassland in sandy or gravelly soils from 400 to 6,300 feet.

Slender threadplant is reported from the east side of the San Joaquin Valley, Inner Coast Ranges, Outer Coast Ranges and southern Sierra Nevada, from Merced County south to Kern and Los Angeles counties, as well as Nevada and Arizona (CNPS, 2012). CCH (2012) reports only 25 records from many disparate localities. The nearest location to the project area is from Caliente, which is within 15 miles from the Caliente Creek parcels. Threadplants are frequently overlooked and under-collected, in part because of their small stature and fragility, and in part because they appear much more abundantly in high rainfall years and very little in dry years. However, there is moderate to high potential that this species could be found in the Caliente Creek parcels in a favorable year.

***Orthotrichum shevockii* (Shevock's bristle moss)**

Shevock's bristle moss has no state or federal listing status, but it has a CRPR of 1B.3, indicating that it is rare, threatened, or endangered in California and elsewhere, but not very endangered in California (CNPS, 2012). It is designed by BLM as a special-status species (BLM, 2011). It is a moss in the bristle moss family (Orthotrichaceae). This species is found in Jeffrey pine forest, Joshua tree woodland, and pinyon juniper woodland, on granitic rocks in underhangs with reflected light. The known elevation range for the species is from 2,500 to 7,000 feet. Shevock's bristle moss is known from Kern and Tulare counties, primarily from the Piute Mountains and the southern Sierra Nevada. The nearest records are from the Scodie Mountains, about ten miles to the north of the project area. The most likely habitat is at Landers Meadow. Mosses are generally not well inventoried by most botanists and the geographic distribution of mosses is likely to be developed more fully as these species receive more attention.

***Pentachaeta fragilis* (Fragile pentachaeta)**

Fragile pentachaeta has no state or federal status and has a CRPR of 4.3, meaning it is uncommon and not very endangered in California. It is an annual in the sunflower family (Asteraceae). It is slender, 4 to 16 cm in height, and mostly glabrous, with seven to 12 well-developed yellow ray flowers and only 10 to 23 disk flowers. Fragile pentachaeta flowers from March to June. This species is found in chaparral and lower montane coniferous forest, in grassy openings on sandy soils. The elevation range for the species is from 160 to 6,900 feet.

Most records for fragile pentachaeta are from the South Coast Ranges, Transverse Ranges, and southern Sierra Nevada, but there also are some records from the San Joaquin Valley. There are a few records from the western Mojave Desert. This species is reported from eight California counties, from Merced southward along the coast to Ventura County, and eastward to Kern County. CCH (2012) reports a single record (POM351184) from the southern end of Kelso Valley, about a mile south of Schoolhouse Well and Parcel K-20. Botanical surveys for the North Sky River Wind Farm expanded the number of records for this species just east of Kelso Valley in grassland and open California juniper woodland, and in blue oak woodland and Tucker oak chaparral. The plant was usually found with annual grasses and forbs in areas with little litter or overstory cover (GANDA, 2010). This diminutive and somewhat generic-looking plant is likely

to be overlooked, but could be present in western Kelso Valley, Landers Meadow and several Caliente Creek parcels.

***Phacelia exilis* (Transverse Range phacelia)**

Transverse Range phacelia has no state or federal status and has a CRPR of 4.3, meaning it is uncommon and not very endangered in California. It is an annual herb formerly placed in the waterleaf family (Hydrophyllaceae) and now assigned to the borage family (Boraginaceae) (Baldwin et al., 2012). This plant has shallowly-lobed stem leaves, relatively large (5-10 mm) deciduous lavender corollas with white at the base, stamens included or barely exserted, and five to 20 seeds per fruit. Its flowering period is from May to August. Transverse Range phacelia is found in lower montane coniferous forest, upper montane coniferous forest, and meadows and seeps. Its reported microhabitat is sandy or rocky slopes, flats, and meadows. The reported elevation range is 3,600 to 8,900 feet.

The great majority of occurrence records for Transverse Range phacelia are from the San Bernardino Mountains, many in the vicinity of Baldwin Lake and Bear Valley. However, there are some records in the Piute and Greenhorn Mountains in the southern Sierra Nevada, and several in the San Emigdio Mountains in the western Transverse Ranges. The records nearest the project area are at Claraville Flat, southeast of Piute Peak (JEPS39518), and in French Meadow (CAS5474326), which is two miles west of Landers Meadow. This plant seems likely to occur in the Landers Meadow parcels, and possibly in the western Kelso Valley parcels in the upper elevations.

***Phacelia nashiana* (Charlotte's phacelia)**

Charlotte's phacelia has no state or federal status, but is ranked as a CRPR 1B.2 plant, meaning it is rare and endangered in California and is fairly endangered there. It is considered by BLM Ridgecrest Resource Area to be a Sensitive species (2011). It is an annual herb formerly placed in the waterleaf family (Hydrophyllaceae) and now assigned to the borage family (Boraginaceae). This distinctive plant has rounded, crenate (scalloped) leaves and flat to bell-shaped, bright blue flowers with a white dot at the base of each lobe. The style is cleft more than half its length. It flowers from March to June. Charlotte's phacelia is found in Mojavean desert scrub, Joshua tree woodland and pinyon and juniper woodland, on sandy to rocky, often granitic slopes and sometimes volcanic substrate. The elevation range for this species is from 2,000 to 7,900 feet.

Charlotte's phacelia grows in the hills and mountains of the western Mojave Desert and the slopes of the adjoining Sierra Nevada. It is reported from 17 quadrangles in Tulare, Inyo and Kern counties (CNPS, 2012). CCH (2012) also reports several records from Anza-Borrego State Park. It is reported from seven CNDDB (2012) localities on the Cinco quadrangle, including five from the general vicinity of Jawbone Canyon. One is reported from Parcel J-3 (CNDDB Occ. 16), one is in Section 18 between Parcels J-3 and S-5 (CNDDB Occ. 49); one is in sections 6 and 31 about a mile southwest of Parcel J-5 (CNDDB Occ. 50); and two are south of Blue Point in sections 22 and 23, about a mile southwest of Parcel J-1 (CNDDB occs. 60 and 61).

We visited CNDDB Occurrence 16 monthly during March, April and May 2012 but did not find any Charlotte's phacelia. Few annual herbs were present at all. We located a small population of Charlotte's phacelia in very early flower in early April on Parcel A-5. We revisited this locality in early May and found that the population had dried and become undetectable. However, with the relatively numerous known localities in and near the project area and the extent of apparently

suitable habitat, it is likely that this species could be present in many parcels in the Jawbone Canyon, Sugarloaf, Dove Spring, Alphie Canyon, and Butterbredt areas.

***Ribes menziesii var. ixoderme* (Aromatic canyon gooseberry)**

Aromatic canyon gooseberry has no state or federal status, but is ranked as a CRPR 1B.2 plant, meaning it is rare and endangered in California and is fairly endangered there. It is considered by BLM Bakersfield Resource Area to be a Sensitive species (BLM, 2011). It is a woody shrub in the gooseberry family (Grossulariaceae). This species has spines on the nodes of the branches, the strongly aromatic leaf blades are glandular on the undersides, the inflorescences consist of fewer than five white to pink flowers while the sepals and fruit are purple. This species flowers in April. Aromatic canyon gooseberry is found in chaparral and montane woodland in forest openings. The known elevation range is 2,000 to 3,800 feet.

Aromatic canyon gooseberry is known the southern Sierra Nevada foothills from six quadrangles in Fresno, Tulare, and Kern counties. The southernmost quadrangle is in Caliente Canyon on the Loraine quadrangle, adjacent to the Emerald Mountain quadrangle (CNDDB Occ. 1), although this is a non-specific locality. Although the Caliente Creek parcels are generally higher in elevation than the range reported for this species, the potential occurrence of this species there could not be ruled out.

***Sclerocactus polyancistrus* (Mojave fish hook cactus)**

Mojave fish hook cactus has no state or federal status and has a CRPR of 4.2, meaning it is uncommon but somewhat endangered in California. It is a perennial succulent in the cactus family (Cactaceae). This species grows up to 45 cm in height and is cylindric in form, with prominent stem-ribs. The central spines are of two kinds, long, hooked central spines and straight radial spines. It flowers from April to July. Mojave fish hook cactus is found in creosote bush scrub, Joshua tree woodland and Great Basin scrub, on well-drained rocky slopes and canyons, sometimes on limestone (CNDDB, 2012B). The known elevation range for the species is from 2,100 to 7,700 feet.

Mojave fish hook cactus is known from Inyo, Kern and San Bernardino counties and Nevada. Although CNPS reports it from only 10 quadrangles, it is likely to be present at very low densities throughout its known range. The nearest records to the project area are from the Saltdale NW quadrangle, from two records in Red Rock Canyon State Recreation Area (CNPS, 2012; CCH, 2012).

We observed a single Mojave fish hook cactus in Parcel A-5 in Alphie Canyon during 2012 surveys. This cactus was located on a rocky ridge much like many others in the project area. It is probable that more individuals could be located in suitable habitat throughout the Jawbone Canyon, Sugarloaf, Dove Spring, Alphie Canyon, and Butterbredt areas.

***Streptanthus cordatus var. piutensis* (Piute Mountains jewel-flower)**

Piute Mountains jewel-flower has no state or federal status, but is ranked as a CRPR 1B.2 plant, meaning it is rare and endangered in California and is fairly endangered there. It is considered by BLM Ridgecrest field office to be a Sensitive species (BLM, 2011). Piute Mountains jewel-flower is an herbaceous perennial herb in the mustard family (Brassicaceae). This erect plant typically grows to 30 to 90 cm in height and is simple or few-branched with a

basal rosette and stem leaves reduced above. The inflorescence is a spike with sepals green-brown to purple, the petals purple to brown. It flowers from May to July. Piute Mountains jewel-flower is found in open chaparral and Piute cypress stands, often on red-clay soils. The elevation range for the species is 3,600 to 5,700 feet.

Piute Mountains jewel-flower is reported from the southern Sierra Nevada in the Piute Mountains. Reported from only four quadrangles, this species is fairly closely associated with Piute cypress stands and their associated habitat. The Sweet Ridge locality (CNDDB Occ. 4), reported by GANDA (2010) as part of the North Sky River Wind Farm project, is a few miles to the northeast of the Caliente Creek parcels. Since soils in the Caliente Creek parcels include some of metamorphic origin, this species was considered potentially occurring there.

***Symphyotrichum defoliatum* (San Bernardino aster)**

San Bernardino aster has no state or federal status, but is ranked as a CRPR 1B.2 plant, meaning it is rare and endangered in California and is fairly endangered there. It is considered by BLM Ridgecrest field office to be a Sensitive species (BLM, 2011). It is a rhizomatous perennial herb in the sunflower family (Asteraceae). This erect plant grows to 40 to 100 cm in height and is strigose (having stiff, appressed hairs) throughout. Flower heads are in a narrow, cyme-like cluster with oblong phyllaries green at the tips and pale-margined at the base. The 15 to 40 ray flowers are white to pale violet, and the fruits are hairy. San Bernardino aster is found in marshes and swamps, meadows and seeps, coastal scrub, cismontane woodland, lower montane coniferous forest, and grasslands. Its microhabitat is vernally mesic grassland, disturbed places, and near ditches, streams and springs. The reported elevation range for the species is below 6,700 feet.

San Bernardino aster is reported in the San Gabriel, San Bernardino and Peninsular ranges and many coastal localities from Kern and San Luis Obispo counties southward to San Diego and Imperial counties. In the vicinity of the project area, there is a report of the species from Landers Meadow (CNDDB Occ. 42). Although non-specific it most likely is within one of the Landers Meadow parcels within the survey area. The most likely place for this species within the survey area is at the two Landers Meadow parcels containing meadows (L-1 and L-2).

3.3 Descriptions of Parcels

In this section, the characteristics of each parcel will be described—location, physical conditions, vegetation present, potential for special-status plants, and degree of disturbance. Parcels will be presented in numerical order within parcel groups, in the following sequence: Jawbone Canyon, Sugarloaf, Dove Spring, Alphie Canyon, Butterbredt, Kelso Valley, Landers Meadow, and Caliente Creek.

3.3.1 Jawbone Canyon Parcels

Parcel J-1 (APN 444-090-04)

This 640-acre parcel is located near the western end of the Jawbone Open Area, on the northeastern corner of the intersection between Jawbone Canyon Road and Alphie Springs Road. It consists of steep, rugged terrain generally sloping to the south and west, with some alluvial valleys at the feet of the steep slopes. Although several watercourses are noted on the USGS Cinco quadrangle, they have relatively small watersheds and probably flow only during substantial storms. The elevation range for Parcel J-1 is 900 feet, from 2,550 feet in Jawbone Canyon to 3,450 feet at the rocky summits. The soils are Jawbone and Typic Torriorthents-Rock Outcrop, all soils formed in granite parent rock or in alluvium formed from granitic material.

Vegetation resources. Most of Parcel J-1 was mapped as lower Mojave mixed woody scrub; vegetation was generally rather sparse and consisted of a complex mosaic of species found in arid, rocky situations, such as Acton's encelia, indigo bush, bladder sage, white bursage, chaparral yucca, and Nevada ephedra. Some of the lower, less steep slopes with more soil accumulation supported creosote bush scrub and creosote bush-white bursage scrub, sometimes with allscale on the lower slopes. The alluvial valleys on the western side of the parcel supported desert wash and cheesebush scrub. Desert wash was mapped on two of the largest canyons. A small amount of allscale scrub was mapped in the southwestern corner where the parcel included the floor of Jawbone Canyon. On higher elevation plateaus, a small area of blackbrush scrub was mapped, while the highest areas were mapped as rock outcrops with very little vegetation. In these sparse areas, some typical species were chaparral yucca, desert needlegrass (*Stipa speciosa*), and California buckwheat.

Special-status plant resources. Although no special-status plants were observed during field surveys, the high, rocky slopes had potential for Mojave fish hook cactus and limestone dudleya, while the loose talus slopes had potential for Charlotte's phacelia. The open, sandy slopes and washes in the side canyons had potential habitat for Death Valley sandmat, white pygmy-poppy, crowned muilla, and possibly Mojave tarplant, solitary blazing star and creamy blazing star.

Disturbance factors. This parcel contains no designated roads or routes. It is partially within the Jawbone Open Area and no signage or fencing warns against OHV usage. As a result, OHV tracks were very abundant in Parcel J-1 on the smooth, sandy lower slopes; along ridges; and in washes and draws up to the point where rocks become obstacles. Erosion was evident on ridge tops and in the southeastern corner of the parcel on loose, sandy soils

Parcel J-2 (APN 181-080-32)

This 614-acre parcel is located in Poleline Canyon, about one-third mile north of Jawbone Canyon, almost 2 miles west of Highway 14. It bisected by Poleline Canyon Road. The parcel contains a broad valley in the northern half which narrows into a canyon, then broadens as it empties into Jawbone Canyon. The parcel contains two major washes, Poleline Canyon and a tributary, that merge just south of the southern parcel boundary. According to the Friends of Jawbone trails map (Friends of Jawbone (FOJ), 2011), this parcel contains two designated routes labeled LA1 and LA2, referring to access roads used for the construction of Los Angeles Department of Water and Power Aqueducts 1 and 2. The LADWP Aqueduct 2 passes through this parcel as a siphon. The elevation range for Parcel J-2 is about 500 feet, from 2,464 to 2,962 feet. The soils in this parcel are primarily Cutterbank soils, uplifted lakebed soils formed from well-weathered granitic alluvium. The broad areas with low slopes are Koehn sands, alluvial fans formed from granitic material.

Vegetation resources. The great majority of Parcel J-2 was mapped as creosote bush-white bursage scrub. The south-facing slopes supporting this vegetation type had Acton's encelia, indigo bush and California buckwheat as typical associates, while the north-facing slopes had green rabbitbrush, goldenbush, Sandberg bluegrass (*Poa secunda*) and indigo bush as associates. Some very steep and rocky slopes in the northwest corner of the parcel were mapped as white bursage; these areas had low cover of with limited shrub diversity. The washes were mapped as an extensive area of blackstem rabbitbrush in the braided active channel. Alluvial terraces were mapped as allscale scrub in several places; these typically had very dense shrub cover. The upper portion of one wash was mapped as cheesebush scrub. Shrub associates in cheesebush scrub included Acton's encelia, bladder sage, and desert senna.

Special-status plant resources. Blackstem rabbitbrush is a sensitive natural community, and Parcel J-2 contains examples in washes that extend for some distance in Poleline Canyon and its tributary. Although no special-status plants were observed during field surveys, the high, rocky slopes had potential for Mojave fish hook cactus and limestone dudleya, while the loose, talus slopes had potential for Charlotte's phacelia. The open, sandy slopes and washes in the side canyons had potential habitat for Death Valley sandmat, white pygmy-poppy, crowned muilla, and possibly Mojave tarplant. The Cutterbank soils formed from lakebed sediments appeared likely to support Mojave spineflower, and potentially solitary blazing star and creamy blazing star. Less likely is the potential for Red Rock tarplant in clay-enriched washes.

Disturbance factors. The combination of proximity to the Jawbone Open Area, the presence of several roads and the broad, braided washes has made Parcel J-2 a popular area for vehicular use. Aerial photographs show many trails along ridges and washes, and this parcel was considered to have a moderate to high degree of disturbance.

Parcel J-3 (APN 181-080 11)

This 582-acre parcel is located in the center of Jawbone Canyon where LADWP Aqueduct 1 crosses Jawbone Canyon Road. Excluded from this parcel is the LADWP building and corporation yard on the north side of Jawbone Road. A few ephemeral drainages are shown on both the north and south side of Jawbone Canyon, but the primary drainage is Jawbone Canyon itself. A fairly large side canyon runs in a northeasterly direction through the southeastern part of the parcel, emptying into Jawbone Canyon east of this parcel. The broad valley of Jawbone Canyon is accentuated by the very rugged slopes rising to the north and south of the canyon. The elevation range for Parcel J-3 is almost 900 feet, from 2,360 feet in the valley floor to 3,240 feet on the ridgetop south of Jawbone Canyon. The soils are Koehn sands in the valley floor and Jawbone association on the slopes and ridges; both are formed on or in granitic materials.

Vegetation resources. The braided, active channel in Jawbone Canyon was mapped as scalebroom scrub, a dense, uniform vegetation type with limited shrub diversity. The adjacent terraces were mapped as allscale scrub. The alluvial fans upslope from this, especially on the north side of the canyon, were mapped as creosote bush scrub. Although cover by creosote bush was relatively high, associates included allscale, cheesebush, Acton's encelia, and even some scalebroom. The extensive uplands, both north and south of Jawbone Canyon, were mapped as creosote bush-white bursage scrub; this was the largest mapping unit in Parcel J-3. On north-facing slopes this vegetation type was fairly diverse and contains Nevada ephedra, indigo bush, and California buckwheat, while south-facing slopes were sparse, uniform, and rather low in diversity. Several interesting mapping units were noted on the upper slopes in the southern half of the parcel—gently sloping ridgetops supported uniform, low-diversity blackbrush scrub, and some north-facing slopes supported areas dominated by spiny hopsage and Nevada ephedra. The side canyon noted in the southeastern corner of the parcel supported white bursage scrub on the barren ridges, and Nevada ephedra on the lower slopes. A small seep was noted midway up the north-facing slope in the canyon west of the LADWP service road.

Special-status plant resources. Sensitive natural communities observed in Parcel J-3 included the the spring and seep midway up the north-facing slope south of Jawbone Canyon, the patch of spiny hopsage scrub at the top of this slope, and the scalebroom scrub in the center of Jawbone Canyon.

Parcel J-3 has a known locality for Charlotte's phacelia on the south-facing slopes above Jawbone Canyon (CNDDB Occ. 16). In addition, the rocky outcrops contain habitat for Mojave fish hook cactus and limestone dudleya, while the sandy soils in the canyons and draws could contain

habitat for crowned muilla, Death Valley sandmat, white pygmy-poppy, and potentially solitary blazing star and creamy blazing star.

Disturbance factors. Since this parcel is situated entirely within the Jawbone Open Area, it is not surprising that certain areas of the parcel are heavily impacted by OHV use. The canyon bottom is criss-crossed with trails throughout, and some of the smooth lower slopes at the base of the hills near the canyon are nearly devoid of vegetation from OHV use. Erosion gullies starting from the LADWP road do not seem to be the result of OHV use, but there are many OHV trails in the uplands and side canyons. Saharan mustard was regularly observed in the canyon floor of this parcel.

Parcel J-4 (APN 181-080-30)

This 550-acre parcel is located at the mouth of Jawbone Canyon. It contains mostly low hills and gentle bajadas as well as the full width of the valley floor in Jawbone Canyon, about a quarter-mile in width. In addition to the east-west Jawbone Canyon Road, the LAWDP power line and service road pass from north to south in the parcel, as well as LA Aqueduct No. 2. The elevation range for the parcel is about 300 feet, from 2,130 to 2,440 feet. The valley floors are mapped as Koehn sands, and the low hills on the eastern side are Cutterbank soils, formed in lakebed sediments derived from granite.

Vegetation resources. As with other parcels in the Jawbone area, the active channel in Jawbone Canyon supported dense, uniform scalebroom scrub, and the adjacent floodplain supports allscale scrub of varying density. Slightly higher fans and old terraces supported a broad swath of creosote bush scrub, while the nearby slopes support creosote bush-white bursage scrub. Typical associates in this vegetation type were cheesebush and desert senna. One area on the eastern side of the parcel was mapped as barren and contained fine-textured lakebed soils. The unvegetated area next to Jawbone Canyon Road used for camping and staging areas was mapped as developed to distinguish it from barren areas with unusual soils and vegetation.

Special-status plant resources. The sensitive natural community mapped in Parcel J-4 was the scalebroom scrub. The barren area with Cutterbank soils has high potential to support Mojave spineflower, and the sandy flats and washes could support Death Valley sandmat. Less likely are Charlotte's phacelia, limestone dudleya and Mojave fish hook cactus in the rocks and higher slopes; crowned muilla, creamy blazing star and solitary blazing star on the lower slopes and flats. Although the soils are not of volcanic origin, Red Rock poppy was also considered to have low to moderate potential to occur on the Cutterbank soils in the eastern portion of the parcel because of their clay content and proximity of the parcel to known localities for this species.

Disturbance factors. The amount of human-caused disturbance in Parcel J-4 was very high. This area is near the entrance to the Jawbone Open Area, is fully contained within the designated open area, and has accessible topography. Airphotos show a network of tracks throughout the valley floor of Jawbone Canyon and nearby gentle slopes, and tracks up the steeper nearby slopes as well. The invasive Saharan mustard was observed in this parcel.

Parcel J-5 (APN 181-190-02)

This 480-acre parcel is located 0.5 to 1 mile south of Jawbone Canyon, about 2 miles west of the canyon mouth at Highway 14. It contains no roads or designated routes. It is bisected by Water Canyon, a broad deep canyon that drains the northern half of the parcel toward Jawbone Canyon. The eastern slopes of the parcel descend toward Fremont Valley; these contain a few small canyons with ephemeral watercourses. The elevation range for the parcel is 950 feet, from 2,360 feet at the base of the eastern slopes, to 3,316 feet on the western ridgetops above Water Canyon.

The soils in this area are mapped almost entirely as Jawbone association, with a little Koehn sand in the floor of Water Canyon. There is an extensive area of barren, highly colored sedimentary deposits on the eastern slopes that suggest the presence of some finer-textured soils, possibly of the Cutterbank group.

Vegetation resources. The vegetation found in Parcel J-5 was typical of lower-elevation desert, although it is diverse because of the different microhabitats provided by the steep, rocky exposures in Water Canyon and the eastern slopes. Scalebroom scrub was mapped along the active channel in Water Canyon, and desert wash and cheesebush scrub was mapped on adjacent floodplains. The canyon floor and adjacent rocky slopes contained bladderpod (*Peritoma* (=*Isomeris) arborea*), desert almond (*Prunus fasciculata*), Thurber's sandpaper plant (*Petalonyx thurberi*), and desert baccharis. The extensive uplands supported mostly white bursage and creosote bush-white bursage scrub. More unusually, some of the higher north-facing slopes supported blackbrush, and a large area deep within Water Canyon supported Joshua tree/white bursage woodland, a somewhat unusual combination. The spring, mapped as meadow and seep, at the upper end of Water Canyon was fairly substantial and supported iris leaved rush (*Juncus xiphioides*) and cattails. The extensive barren area mapped on the eastern slopes was unusual-looking but was not considered sensitive.

Special-status plant resources. Parcel J-5 contained several natural communities considered sensitive from a regional or statewide perspective. Joshua tree woodland is ranked S3 statewide, although it is widespread in the project area. The scalebroom scrub in the canyon floor is considered a sensitive natural community. Although no special-status plants were observed in the barren area on the eastern slope, it appeared to be potential habitat for a number of special-status plants, such as Mojave spineflower and Red Rock poppy. In addition to being sensitive on its own, the seep and spring habitat in the upper canyon provides potential habitat for Red Rock tarplant, Mojave tarplant, and alkali mariposa-lily, as well as streambank spring beauty, which was reported by DeDecker from Water Canyon. The rocky canyons with their many slopes and exposures contain potential habitat for Charlotte's phacelia, Mojave fish hook cactus, desert cymopterus, and limestone dudleya. The canyon floor could provide habitat for crowned muilla, solitary blazing star and creamy blazing star.

Disturbance factors. The lower portions of Water Canyon were criss-crossed with OHV tracks, but these lessened farther up the canyon when the bottom became too narrow and rocky for vehicle passage.

3.3.2 Sugarloaf Area Parcels

Parcel S-1 (APN 153-240-12)

This 617-acre parcel is located just west of the LADWP aqueducts and 1 mile north of Sugarloaf Peak. In addition to the Aqueduct service roads that define a portion of the eastern boundary of this parcel, a designated route (SC175) bisects Parcel S-1. This parcel is situated on gentle topography that slopes slightly to the east. It is divided by several well-defined washes that flow in a southeasterly direction. The elevation range for this parcel is about 200 feet, from 3,120 to 3,340 feet. The soils in this parcel are primarily Dovecanyon loamy sand in most of the western portion of the parcel, but about one-fifth of the parcel is mapped as Cutterbank soils formed in lakebed sediments; these are in the northeastern portion of the parcel.

Vegetation resources. Nearly all of the parcel was mapped as blackbrush-creosote bush scrub. Some small areas in the southern portion of the parcel were mapped as creosote bush scrub; these

were very sparse and barren. An area in the southwestern corner of the parcel was mapped as blackbrush scrub alone. Four washes were mapped as desert wash.

Special-status plant resources. The Cutterbank soils in the eastern part of the parcel have potential to support Mojave spineflower, while the sandy soils elsewhere have potential to support white pygmy-poppy, crowned muilla, Death Valley sandmat, and solitary blazing star.

Disturbance factors. This parcel is unusual in having several miles of roads identified on USGS Dove Spring quadrangle but are not designated routes. The airphoto indicates these roads are well-defined, as are some additional tracks.

Parcel S-2 (APN 153-240-14)

This 127-acre parcel is located just west of the LADWP aqueducts and about 2 miles north of Sugarloaf Peak. This parcel is situated on a nearly level plain that slopes gently to the east. The aqueduct road (LA2) is a short distance east of the eastern boundary of the parcel. The USGS Dove Spring topographic map shows a road passing east to west near the northern boundary of the parcel, but this is not a currently designated OHV road. The elevation range for Parcel S-2 is almost 900 feet, from 3,360 to 3,480 feet. The soils in Parcel S-2 are mostly Dovecanyon loamy sand in most of the northeastern portion of the parcel, but about one-third of the parcel is mapped as Cutterbank soils, finer-textured soils formed in lakebed sediments; these are in the southwestern portion of the parcel.

Vegetation resources. The uplands in Parcel S-2 were all mapped as blackbrush-creosote bush scrub. The uplands were remarkably uniform in this area, with relatively low diversity in the shrub layer. Two desert washes were well-defined, with broad sandy channels and floodplain and limited shrub cover consisting of rubber rabbitbrush and cheesebush with a little scalebroom along the active channel.

Special-status plant resources. The Cutterbank soils have potential to support Mojave spineflower, while the sandy soils elsewhere have potential to support white pygmy-poppy, crowned muilla, Death Valley sandmat, and solitary blazing star. Rocky areas may have potential to support Mojave fish hook cactus and desert cymopterus.

Disturbance factors. This parcel has a moderate amount of tracks criss-crossing the uplands and following the ridges. No weed infestations were noted.

Parcel S-3 (APN 153-240-16)

This 327-acre parcel is located at the eastern edge of the EKCA project area. It is bisected by the LADWP power line and service road, a designated OHV route. The power line and the service road follow somewhat different routes through the parcel as the service road ascends the much-dissected hills. The northern portion of the parcel contains a broad, gently sloping, sandy bajada, while the southern portion of the parcel contains highly dissected hills of moderate height. The elevation range of the parcel is almost 400 feet, from 2,800 to 3,180 feet. The soils in Parcel S-3 are mostly Cutterbank lakebed soils, with a small amount of Dovecanyon loamy sand in the northern portion.

Vegetation resources. The great majority of the uplands in Parcel S-3 were mapped as creosote bush-white bursage scrub; however, the density and cover were much higher in the Dovecanyon soils in the northern part of the parcel than in the Cutterbank soils in the south. On south-facing, exposed slopes the vegetation was mapped as white bursage scrub, while on the north-facing slopes a higher-diversity mix of shrubs was mapped as lower Mojave mixed desert scrub. Some

small areas with very sparse vegetation and a rocky substrate were mapped as California buckwheat scrub. The most extreme bare areas with gravelly clay were mapped as barren. An extensive system of desert wash habitat was mapped, much of it open sand with sparse rubber rabbitbrush, blackstem rabbitbrush, scalebroom, allscale, and cheesebush.

Special-status plant resources. Death Valley sandmat was observed in Parcel S-3 in two localities during field surveys; this species is expected to occur much more widely in suitable habitat. The relatively small barren area in the center of the parcel could support Mojave spineflower. Mojave fish hook cactus, limestone dudleya and desert cymopterus have potential to occur on the rocky slopes, while the open sandy soils could support crowned muilla, creamy blazing star, and solitary blazing star. Red Rock tarplant and Red Rock poppy could occur as outliers from their known distribution a few miles to the east.

Disturbance factors. The USGS Cinco quadrangle shows one road on the parcel that is not a designated OHV route. Airphotos show some tracks along ridgelines and some in the extensive wash in the northern part of the parcel. For the most part Parcel S-3 appears to have relatively limited OHV disturbance.

Parcel S-4 (APN 181-020-02)

This 614-acre parcel is located between the LADWP aqueducts on the west and the LADWP power line on the east. The parcel slopes generally eastward through dissected hills, with a couple of well-defined washes draining eastward. The southern wash is a designated route (SC 262), the only one in the parcel. The elevation range for Parcel S-4 is 560 feet, from 2,760 feet to 3,320 feet. Soils in most of Parcel S-4 are Cutterbank lakebed soils to the north of SC 262; to the south is Dovecanyon loamy sand.

Vegetation resources. As noted elsewhere, vegetation in the Dovecanyon soils is larger, denser, and more diverse than in the Cutterbank soils. In this parcel, this dense scrub was mapped as creosote bush scrub, while the less dense and less diverse expression on Cutterbank soils was mapped as creosote bush-white bursage scrub. Three broad and well-defined washes supported desert wash scrub dominated by rubber rabbitbrush. A small spring was mapped in the center of the parcel where desert riparian vegetation was observed. An unusually vigorous stand of creosote bush was noted in association with fresh alluvial deposits in the southern portion of Parcel S-4. This was traced back to a break in the LADWP aqueduct.

Special-status plant resources. The small area of desert riparian habitat was considered a sensitive vegetation type. Special-status plants with potential to occur in Parcel S-4 include Mojave fish hook cactus and limestone dudleya on the rocky ridges, Mojave spineflower, Red Rock poppy, and Red Rock tarplant on the terraces and washes in the Cutterbank soils, and Death Valley sandmat, solitary blazing star and crowned muilla on open sandy flats and terraces.

Disturbance factors. Few tracks were visible in this parcel; the more southern wash is a designated route, and the more northern washes were not investigated. No unusual infestations of weeds were noted in this parcel.

Parcel S-5 (APN 181-020-11)

This 613-acre parcel is located west of the LADWP aqueducts and includes Sugarloaf Peak, the highest point in the eastern acquisition area of the EKCA survey area. The elevation range for this parcel is over 1,100 feet, from 3,000 feet at the southeastern corner of the parcel to 4,132 feet at the top of Sugarloaf Peak. The only designated route is the LA Aqueduct and SC 175 along the eastern side of the parcel. The soils in Parcel S-5 are Typic Torriorthents-Rock Outcrops,

Jawbone Association, and a narrow strip of Cutterbank soils along the eastern margin of the parcel.

Vegetation resources. Vegetation on most of the steep slopes of Sugarloaf Peak was sparse, low-growing, and moderately diverse lower Mojave mixed woody scrub dominated by green rabbitbrush, California buckwheat, interior goldenbush, bladder sage, and cheesebush. The lower slopes and alluvial fans supported more typical creosote bush-white bursage scrub and cheesebush scrub. The eastern area of Cutterbank lakebed sediments was mapped as rock outcrop; this area had very low plant cover. The washes supported a sparse stand of desert wash scrub dominated by rubber rabbitbrush and cheesebush. Parcel S-5 contained the only stand of mesquite scrub observed in the survey area; this was found at a small seep on the eastern, lower slope of Sugarloaf Peak.

Special-status plant resources. Although very small, the example of mesquite scrub on the lower slope of Sugarloaf Peak was a unique and sensitive natural community. Because of the extensive rock outcrops with every aspect, this parcel has potential to support Mojave fish hook cactus, Charlotte's phacelia, and limestone dudleya. The sandy flats at lower elevations could support Death Valley sandmat, crowned muilla, solitary blazing star and creamy blazing star. The fine-textured lakebed soils on the eastern side of the parcel could support Mojave spineflower.

Disturbance factors. The USGS Cinco quadrangle shows a route up to the top of Sugarloaf Peak; although fenced off currently, this has been widely used by OHVs, both on and off the identified route. On the ridgeline track leading to the top of the peak, all vegetation and most soil was eroded away, and cross-country tracks on the side of the mountain have caused substantial erosion.

Parcel S-6 (APN 181-020-13)

This 622-acre parcel is located 1 mile east of the Sugarloaf Peak parcel. The LADWP power line and service road pass through the eastern portion of the parcel, and a designated route (SC 262) passes northwestward along a wash through the parcel. This parcel slopes southeastward through highly dissected hills toward Red Rock Canyon. Several broad washes drain east and southeastward; a well-developed spring is located just west of the parcel, and a less-developed spring and associated riparian habitat are present in the central portion of the parcel. Parcel S-6 has an elevation range of almost 470 feet, from 2,500 feet in the southeastern corner to 2,967 feet on a knoll at the northwestern corner. The soils throughout most of the parcel are Cutterbank lakebed soils, with a small area of Koehn coarse sands in the northeastern corner of the parcel.

Vegetation resources. Most of the parcel was mapped as either creosote bush scrub or creosote bush-white bursage shrub. The vegetation growing on Koehn coarse sands was, as usual, larger and denser than that found on the less productive Cutterbank soils. However, this parcel was unusual in having a large area of very barren, highly dissected soils that were some of the most extreme expression of the Cutterbank soils—dense, fine-textured soils with a gravelly surface. This parcel was also unique in supporting a fairly large area of creosote bush-desert senna scrub. This parcel also contained many well-defined washes with low cover, typically rubber rabbitbrush, cheesebush, and allscale. A small subsurface spring supporting a small stand of desert riparian forest dominated by Fremont cottonwood was observed in the central part of the parcel along a wash.

Special-status plant resources. The desert riparian forest is considered a sensitive natural community, although the example in this parcel is quite small. Several populations of Mojave spineflower were mapped in the barren areas of Cutterbank soils. The populations were small

compared to those from the previous year; in fact, the skeletons of the previous year's plants were more readily detected than the current year's plants. Other species with high potential to occur include Death Valley sandmat and crowned muilla in the open sandy soils, possibly Red Rock tarplant, solitary blazing star and Red Rock poppy in clay soils along the washes, and potentially Mojave fish hook cactus on rock outcrops.

Disturbance factors. OHV tracks were seen on ridgetops in some places, and in the washes to some extent. No infestations of weeds were noted in this parcel.

3.3.3 Dove Spring Area Parcels

Parcel D-1 (APN 153-130-01)

This 640-acre parcel is located about a quarter-mile south of Dove Spring. Dove Spring Road (SC 103) passes through the parcel from north to south. The parcel slopes moderately to the north and east toward Dove Spring Canyon. Several small and ephemeral watercourses drain to the north and east but do not have broad channels. The elevation range for Parcel D-1 is 640 feet, from 4,320 feet in the north to 4,960 feet in the southwest corner. The soils in this parcel are in the Goldpeak-Wingap-Pinyonpeak complex, all formed in granite and granitic alluvium.

Vegetation resources. The higher north-facing slopes in Parcel D-1 were mapped as supporting Joshua tree/blackbrush woodland, while the lower slopes supported blackbrush scrub. In general the blackbrush scrub was moderately diverse, with elements of upper Mojave mixed woody scrub such as spiny hopsage, horsebrush, Nevada ephedra, and Cooper's box thorn. A small area was mapped as annual grassland; this was near the road and may have been the result of a fire. Blackbrush recovers from fire very slowly, so this event could have occurred some years ago. A few shrubs, mainly Nevada ephedra, were beginning to reappear in the annual grassland, but most of the vegetation was redstem filaree, red brome, devil's lettuce (*Amsinckia tessellata*), and yellow tansy mustard (*Descurainia pinnata*).

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. The coarse sandy flats found in Parcel D-1 have potential to support Kern County evening-primrose, white pygmy-poppy and Death Valley sandmat, while the rocky outcrops and loose slopes could support limestone dudleya and Charlotte's phacelia. Sandy soils and washes throughout the site could provide habitat for solitary blazing star and crowned muilla.

Disturbance factors. A few tracks were evident on airphotos; these could have been from livestock or OHVs. No unusual weed infestations were noted in this parcel.

Parcel D-2 (APN 153-130-03)

This 640-acre parcel is situated along Dove Spring Canyon, which passes through the northern portion of the parcel. Dove Spring Canyon is a significant watercourse which contains springs at various points along its length. Several tributary watercourses flow northward into Dove Spring Canyon within the parcel, but these carry only ephemeral flows. The parcel as a whole slopes moderately to the north and east. One designated road, SC 103, originates at the Dove Springs Open Area and follows the canyon up to Gold Peak Well, in the northeastern corner of Parcel D-2, then turns to the southwest and ascends the hills. A fence has been constructed adjacent to the road, evidently to discourage OHV trespass. An historic road is shown continuing up Dove Spring Canyon, but it appears to be disused. The elevation range for Parcel D-2 is 540 feet, from 3,620 feet at the northeastern corner to 4,160 feet on the western side. The soils in this parcel are

Pinyonpeak-Wingap-Rock Outcrop and Goldpeak complex, all soils formed in granite and associated alluvial fans.

Vegetation resources. Parcel D-2 had some unusual and distinctive vegetation. First, Dove Spring Canyon contained a continuous band of desert riparian vegetation for over a quarter-mile consisting primarily of willow scrub, rushes, and salt grass, with a varied understory of herbs and grasses. Downstream from this extensive desert riparian scrub was an herbaceous-dominated area with only rushes and salt grass; this was mapped as meadow and seep. A narrow band of scalebroom scrub continued downstream from this point. Although too small to map, a dense band of fourwing saltbush (*Atriplex canescens*) was observed growing for several hundred feet along the north side of the wash; it appeared to be associated with lateral seepage. Still farther downstream was a broad wash and terrace supporting cheesebush scrub. The hills to the north of Dove Spring Canyon were steep, sandy, and sparsely vegetated; despite the high elevation, the species here were characteristic of lower Mojave mixed woody scrub—Acton's encelia, grape lupine, white bursage and Nevada ephedra. The uplands in most of Parcel D-2 were dominated by blackbrush scrub, much of which contains very sparse Joshua trees. Two broad, gently sloping areas had higher densities of Joshua tree and were mapped as Joshua tree/blackbrush woodland. Several north-facing slopes, perhaps with deeper soils, supported a diverse mix of shrubs containing spiny hopsage, narrow scaled felt thorn (*Tetradymia stenolepis*), Cooper's box thorn, and desert needlegrass; these were mapped as upper Mojave mixed woody scrub.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. The riparian scrub and meadow complex along Dove Spring Canyon was the largest single, continuous wetland and riparian area in the eastern acquisition area. In addition to being a sensitive natural community, this riparian and meadow habitat could support alkali mariposa-lily and Mojave tarplant, while the nearby washes could support solitary blazing star. Potential habitat was present in the sandy and gravelly uplands for white pygmy-poppy, Kern County evening-primrose, Death Valley sandmat and crowned muilla. Although talus slopes were limited, potential habitat also was present for Charlotte's phacelia.

Disturbance factors. We observed limited OHV use of the parcel west of the fenceline, and some of the tracks visible on the airphoto may be from livestock usage. Tracks were increasingly abundant east of the road and fenceline near the Dove Spring Open Area. No unusual weed infestations were noted.

Parcel D-3 (APN 153-130-05)

This 640-acre parcel is located about 1.5 miles southeast of Dove Spring. Dove Spring Road (SC 103) passes through the parcel and is intersected by designated routes SC 99 and SC 129 there. Parcel D-3 contains a high knoll, but most of the parcel drains to the east. One watercourse is detectable as an unvegetated channel draining eastward through the center of the parcel. The elevation range for the parcel is about 600 feet, from 4,040 feet in the southeastern corner to 4,606 feet at the top of the knoll. The soils in Parcel D-3 are mapped as Goldpeak-Wingap-Pinyonpeak complex, all soils formed over granite or alluvium formed from granite.

Vegetation resources. This parcel was dominated by blackbrush in the shrub layer; blackbrush scrub was mapped in the thinner and more rocky soils on the knolls and in the northern portion of the parcel. In deeper soils, Joshua trees provided significant cover and more shrubs were present, such as California buckwheat and green rabbitbrush. Here, the vegetation was mapped as Joshua tree/blackbrush woodland.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Special-status plants with potential to occur in Parcel D-3 include Kern County evening-primrose and white pygmy-poppy on gravelly flats; and Death Valley sandmat, solitary blazing star and crowned muilla in sandy washes and flats.

Disturbance factors. Some old tracks shown on the USGS Dove Spring quadrangle are not designated routes. A linear, apparently scraped, area extended slightly into the southeastern corner of the parcel; the cause or purpose of this disturbance is unknown. In addition, a few tracks were evident on airphotos, indicating a low level of existing disturbance.

Parcel D-4 (APN 153-150-04)

This 640-acre parcel is located about 3 miles southeast of Dove Spring. A designated road (SC 99) passes through the parcel from northwest to southeast, while another (SC 171) crosses from west to east. The parcel slopes gently eastward, with two ephemeral watercourses mapped on the USGS Dove Spring quadrangle. The elevation range in Parcel D-4 is about 300 feet, from 3,760 to 4,040 feet. The soils in Parcel D-4 are mapped entirely as Goldpeak gravelly loamy sand; these are soils formed in fan remnants of granitic origin.

Vegetation resources. This parcel was mapped entirely as Joshua tree/blackbrush woodland, although the Joshua trees barely provided 1 percent of cover in much of the parcel. Although the soils and vegetation mapping appear uniform at a broad scale, a modest amount of relief and variation in vegetation density is provided in the dissected topography of the old alluvial fans. The drainages contained a fair amount of cheesebush, while the rocky uplands contained species such as Cooper goldenbush (*Ericameria cooperi*) and spiny hopsage.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Death Valley sandmat was reported from this parcel in May 2012; systematic surveys would likely result in more observations of this species. Other species with at least moderate potential to occur include Kern County evening-primrose and white pygmy-poppy on sandy and gravelly flats, solitary blazing star in sandy washes, crowned muilla in open desert scrub, and Mojave fish hook cactus on rocky outcrops.

Disturbance factors. Several tracks cross Parcel D-4 in all directions. These are quite straight, suggesting OHV use more than cattle tracks. No invasive plant infestations were noted in this parcel.

3.3.4 Alphie Canyon Area Parcels

Alphie Canyon runs generally south-southeast through the survey area, from near Dove Spring southward to Blue Point, where it empties into Jawbone Canyon. Parcels are situated on both sides of the canyon. Several large tributary drainages empty into Alphie Canyon within the survey parcels.

Parcel A-1 (APN 153-140-05)

This 640-acre parcel is situated about 7 miles north of Jawbone Canyon and 2 miles south of Dove Spring Road. Alphie Springs Road (SC 176) passes more or less through the middle of the parcel, as does the central wash of Alphie Canyon. The parcel occupies the northernmost broad alluvial fans at the head of Alphie Canyon. The elevation range for the parcel is 480 feet, from 4,600 to 5,080 feet. The soils are Goldpeak-Pinyonpeak-Wingate complex and Wingate-

Pinyonpeak, soils formed over granite and alluvial fans formed from granite. The soils were gravelly and relatively thin.

Vegetation resources. Most of Parcel A-1 was mapped as Joshua tree/blackbrush woodland. As is typical in blackbrush supporting Joshua trees, the shrub layer was moderately diverse and supported other species characteristic of upper Mojave mixed woody scrub, such as horsebrush, big sage, and Nevada ephedra. As is typical for these thin, gravelly soils, the herbaceous layer was rather sparse. A bit of the southern portion of the parcel was mapped as blackbrush scrub, and desert wash was mapped along the main channel of Alphie Canyon for the length of the parcel.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. The gravelly and sandy flats in Parcel A-1 could support Kern County evening-primrose, white pygmy-poppy, and crowned muilla, while the sandy washes and alluvium could support Death Valley sandmat. Rock outcrops and talus slopes could support Mojave fish hook cactus and Charlotte's phacelia.

Disturbance factors. Aside from the designated trail, a few linear features can be seen on aerial photographs. Some connect with old trails shown on the USGS Dove Spring quadrangle and may be OHV trails, while others meander in a way that suggests they are cattle trails. The degree of disturbance in this parcel appears to be low to moderate. No infestations of invasive plants were noted during site surveys in 2012.

Parcel A-2 (APN 153-150-02)

This 400-acre parcel is situated about 6 miles north of Jawbone Canyon. It occupies more or less the northeastern diagonal half of a section and is almost entirely on the eastern side of Alphie Canyon and Alphie Springs Road (SC 176); both the canyon and the road pass through a corner of the parcel for a few hundred feet. In addition to Alphie Canyon, a narrow and poorly-defined draw drains eastward. The elevation range for this parcel is about 340 feet, from 4,280 feet in Alphie Canyon to 4,617 feet on a low knoll to the northwest. The soils in Parcel A-2 are Wingate-Pinyonpeak and Goldpeak-Pinyonpeak-Wingate complex, both soils formed over granite and alluvial fans formed from granite.

Vegetation resources. The vegetation in Parcel A-2 was mapped entirely as Joshua tree/blackbrush woodland. Although blackbrush was by far the most abundant and dominant shrub species, a variety of upper Mojave mixed woody scrub species were present, including Wiggins' cholla (*Cylindropuntia echinocarpa*), beavertail cactus (*Opuntia basilaris*), green rabbitbrush, and Nevada ephedra. A small wash was observed in this parcel; it had a defined channel but limited shrubby vegetation.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. The gravelly and sandy flats in Parcel A-2 could support Kern County evening-primrose, white pygmy-poppy, and crowned muilla, while the sandy washes and alluvium could support Death Valley sandmat. Rock outcrops and talus slopes could support Charlotte's phacelia.

Disturbance factors. The USGS Dove Spring quadrangle indicates an old road passing more or less northward through the parcel, but this is not a designated OHV route. It may still be seen on aerial photographs, along with a variety of linear features criss-crossing the parcel. It is not clear whether some of these are livestock trails or OHV trails. No infestations of invasive plants were noted during field surveys.

Parcel A-3 (APN 153-150-06)

This 280-acre parcel is located about 5 miles north of Jawbone Canyon. This is an "L"-shaped parcel with the southern leg crossing the wash in Alphie Canyon and the eastern, north-south leg on a plateau. Alphie Springs Road (SC 176) passes through this parcel, as does SC 171, the east-west connector to Dove Spring. The San Antonio Mine is nearby to the north and west of this parcel. The elevation range for Parcel A-3 is 400 feet, from 3,780 feet in Alphie Canyon to 4,200 feet on the plateau. The soils are Wingap-Pinyonpeak and Goldpeak soils which are formed over granite and alluvial fans derived from granite.

Vegetation resources. Most of the parcel was mapped as blackbrush scrub, although a portion of the northern arm was mapped as Joshua tree/blackbrush woodland, a diverse scrub with many cactus and large shrubs. Desert wash was mapped in the fairly broad bottom of Alphie Canyon as it passed through this parcel. It supported rubber rabbitbrush, shrubby ragwort, tarragon (*Artemisia dracunculus*), green rabbitbrush on the toe slopes, and grape lupine on the hillslopes above the wash.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. About 25 desert cymopterus plants were observed on a low ridge with loamy sand and a thinly crusted surface containing pebbles and gravel. This observation was unexpected because the nearest records for desert cymopterus are about 20 miles distant. Other species with potential to occur on Parcel A-3 include Death Valley sandmat in the deeper sands and washes, crowned muilla in open sandy places, and potentially Mojave fish hook cactus on rocky sites and Charlotte's phacelia in loose gravel or talus.

Disturbance factors. In addition to the two designated roads, airphotos show a number of traces criss-crossing Parcel A-3. This site has moderate disturbance, and vulnerability because of its proximity to several roads and washes.

Parcel A-4 (APN 153-170-03)

This 640-acre parcel is located 4 miles north of Jawbone Canyon. It is located east of Alphie Canyon proper and Alphie Canyon Road (SC176). The parcel is deeply cut by a tributary wash to Alphie Canyon on the western half, while the eastern half of the parcel consists of very gently sloping uplands. The elevation range for Parcel A-4 is 540 feet, from 3,320 feet in the bottom of the tributary wash to 3,856 feet at the top of a low knoll on the northeastern corner of the parcel. The soils in Parcel A-4 are Wingap, Pinyonpeak, Goldpeak and Jawbone-Typic Haplargids-Rock Outcrop soils which are formed over granite hills and alluvial fans formed from granite.

Vegetation resources. The vegetation in most of the parcel is blackbrush scrub, which extends over all of the eastern uplands and well into the western portion of the parcel. In the steep and somewhat dissected canyon near the drainage were Joshua tree/blackbrush woodland, Joshua tree/Lower Mojave mixed woody scrub woodland, creosote bush-white bursage scrub, and barren. These mapping units were situated in more dissected and steeper terrain, with the steepest and most exposed areas containing barren areas, and the more sheltered canyon supporting Joshua tree woodland. A very small area of alkaline meadow and seep habitat was mapped in the central drainage, which also contained desert wash along its length. The meadow and seep area contained some sandbar willow and arroyo willow, as well as rushes and salt grass. The western wash and canyon contained a very diverse assemblage of plants typically seen in protected, somewhat moist habitats; these included thick pod milk vetch (*Astragalus pachypus*), toad rush (*Juncus bufonius*),

and California goosefoot (*Chenopodium californicum*). Nearly 100 species were observed during field surveys in 2012.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Death Valley sandmat was observed along several hundred feet of the main wash, and could be more extensive than what was mapped. Other species with potential to occur in Parcel A-4 include white pygmy-poppy and crowned muilla in the sandy or gravelly flats in the uplands; alkali mariposa-lily; Mojave tarplant and solitary blazing star in and near the alkaline seep in the main wash; and Charlotte's phacelia and Mojave fish hook cactus in the loose gravel or talus and rock outcrops in the higher uplands.

Disturbance factors. There are no designated routes in Parcel A-4. The USGS Dove Spring quadrangle shows a north-south road parallel to Alphie Canyon Road, and some roads in the eastern half of the parcel. These do not appear to be in active use by OHVs. Aerial photographs show light trails in the blackbrush scrub; and trails were observed along the ridgelines and tracks were seen in the washes. Recent fencing near Alphie Springs Road may curtail use. In terms of invasives, some tamarisk was noted in the central wash near the meadow and seep habitat.

Parcel A-5 (APN 153-170-06)

This estimated 640-acre parcel is located 3 miles north of Jawbone Canyon in Alphie Canyon. This feature extends the length of the parcel from north to south, as well as containing Alphie Canyon Road (SC 176). The parcel is steeply dissected near Alphie Canyon but contains more gradual topography to the west. In addition to Alphie Canyon, an intermittently flooded wash, the parcel contains a series of nine seeps and springs along the Sierra Nevada fault line on the western side of the wash. This is the greatest concentration of such features in the eastern acquisition area. The elevation range in Parcel A-5 is 880 feet, from 3,040 feet in Alphie Canyon to 3,920 in the uplands to the west. The soils are mapped as Wingap-Pinyonpeak and Jawbone-Typic Haplargids, both formed in granite. However, the geologic map (Smith 1964) shows some metamorphic formations west of the Sierra Nevada fault line.

Vegetation resources. The vegetation of Parcel A-4 was fairly complex. The uplands on the western side were all mapped as blackbrush scrub, while the dissected canyons contained barren areas at the top of the slopes, Joshua tree/creosote bush woodland, lower Mojave mixed woody scrub and creosote bush scrub on the upper slopes. Near the canyon bottom was Joshua tree/lower Mojave mixed woody scrub woodland, and in the wash itself was desert wash scrub. On the terraces and benches was allscale scrub. The seeps and springs perched on the side slopes to the west of Alphie Canyon, including Alphie Springs, supported meadow and seep vegetation with areas of desert riparian scrub too small to map. These meadow and riparian areas supported Fremont cottonwood, arroyo willow, and even alkali sacaton, as well as iris-leaved rush and cattails.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. The numerous seeps, springs and desert riparian vegetation are sensitive areas. Two special-status plants were found in this parcel. Mojave fish hook cactus was found on the slopes to the west of Alphie Springs, Charlotte's phacelia was found on a steep slope with loose gravel and small rocks on the eastern side of the parcel. The colony of Charlotte's phacelia was found in very early flower in early April 2012, but by May 3 all plants had dried and become undetectable. Similar habitat was present elsewhere in the parcel.

Other special-status plants with potential to occur in Parcel A-5 include alkali mariposa-lily and Mojave tarplant in and near the seeps and springs; limestone dudleya in the rock outcrops; Death Valley sandmat and solitary blazing star in the washes and canyons;

Disturbance factors. Airphotos show a moderate amount of trails on the ridges in Parcel A-5. Numerous OHV tracks were observed in the canyons to the east of Alphie Springs Road, but these may have been created before the fencing now in place was installed.

Parcel A-6 (APN 153-170-04)

This 600-acre parcel is located on the eastern side of Alphie Canyon about 3 miles north of Jawbone Canyon. It consists of fairly gently sloping uplands in the eastern portion of the parcel and two deeply dissected canyons draining toward Alphie Canyon. There are no designated roads in this parcel, but Alphie Springs Road (SC 176) runs parallel to and just west of the western side of the parcel. The elevation range for Parcel A-6 is 480 feet, from 3,200 feet in the canyons to 3,680 feet in the eastern uplands. The soils are Jawbone, Wingate-Pinyonpeak-Goldpeak, Typic Torriorthents, and Dovecanyon loamy sands; all are formed in granite or granite alluvium.

Vegetation resources. The vegetation in the eastern uplands was mapped primarily as blackbrush scrub; however, near the eastern side of the parcel blackbrush became co-dominant with creosote bush. The dissected canyons supported lower Mojave mixed woody scrub on the more sheltered north- and west-facing exposures, with bladder sage, interior goldenbush, and sticky snakeweed (*Gutierrezia microcephala*), and creosote bush-white bursage scrub on the more exposed south-facing slopes, with Acton's encelia, California buckwheat, and occasional grape lupine. The washes themselves supported desert wash scrub such as shrubby ragwort and desert baccharis, but no seeps were mapped in this parcel.

Special-status plant resources. Death Valley sandmat was observed along the wash in Parcel A-6, and it is likely that additional populations could be found elsewhere in the parcel in suitable habitat. Open sandy or gravelly flats could support white pygmy-poppy and crowned muilla; solitary blazing star and creamy blazing star could occur in canyons, rock outcrops and washes; Charlotte's phacelia, limestone dudleya and Mojave fish hook cactus in the loose gravel or talus and rock outcrops in the higher uplands.

Disturbance factors. Although there are no designated OHV routes in Parcel A-6, the USGS Dove Spring quadrangle shows an historic route from east to west, connecting Alphie Springs with some of the routes on the eastern side of the acquisition area. Airphotos of this parcel show a moderate degree of OHV disturbance, with tracks on ridgelines. The soils were noted as fairly erodible on the hills and slopes where plant cover is limited naturally.

Parcel A-7 (APN 444-070-05)

This 477-acre parcel is located about 2 miles north of Jawbone Canyon. It consists of moderately rugged, dissected uplands cut by several southwest-trending canyons that empty into Alphie Canyon. The elevation range for Parcel A-7 is 640 feet, from 2,960 feet in the canyons in the southwestern corner to 3,584 feet at a knoll on the eastern side. The soils are primarily Typic Torriorthents-Rock Outcrop soils with a small amount of Dovecanyon loamy sand on the eastern side. Both are formed from granite; the former are soils formed in granitic parent material and the latter are formed in fan remnants formed from granitic alluvium.

Vegetation resources. Some of the uplands on the eastern and northern portions of Parcel A-7 were mapped as blackbrush scrub, while most of the central and southern portion of the parcel was mapped as lower Mojave mixed woody scrub, reflecting the decreasing elevation in the

lower portion of Alphie Canyon. Both canyons had extensive areas of desert wash scrub with desert baccharis, blackstem rabbitbrush and scalebroom near the active channel and cheesebush and allscale on the floodplain. No seeps or springs were observed, although groundwater rises to near-surface in a number of places where the canyons are constricted by resistant rocks; these areas often support stands of baccharis and shrubby ragwort. As with the rest of the survey area, herbs tended to be larger, more numerous and more diverse in the wash where slightly more moisture accumulated in this dry year.

Special-status plant resources. Death Valley sandmat was observed along the wash in Parcel A-7, and it is likely that additional populations could be found elsewhere in the parcel in suitable habitat. Open sandy or gravelly flats could support desert cymopterus and crowned muilla; solitary blazing star and creamy blazing star could occur in canyons, rock outcrops and washes; Charlotte's phacelia, limestone dudleya and Mojave fish hook cactus could be found in the loose gravel or talus and rock outcrops in the higher uplands.

Disturbance factors. There are no designated routes within Parcel A-7, although the USGS Cinco quadrangle shows some older tracks following the draws from the southwestern portion of the parcel, heading north and east to the more gentle terrain farther east. Airphotos of the uplands on the eastern side of the parcel show a number of roads and tracks, many of them connecting with the upper ends of the washes.

Parcel A-8 (APN 444-070-09)

This 640-acre parcel is located 1 mile north of Jawbone Canyon. Alphie Springs Road (SC176) and Butterbredt Canyon Road (SC123) both pass through this parcel. This lower portion of Alphie Canyon is characterized by very broad washes and steep, dissected uplands. The elevation range for this parcel is 640 feet, from 2,680 feet in the lower portion of the canyon to 3,320 feet in the rocky uplands. The soils in Parcel A-8 are mostly Jawbone-Typic Haplargids-Rock Outcrop association, with Typic Torriorthents also found in the uplands and Koehn fine sands in the washes. All are associated with granite parent material.

Vegetation resources. This parcel was mapped with blackbrush scrub in the northwestern portion, with creosote bush-white bursage scrub occupying most of the central portion of the parcel. The very broad wash and associated terraces occupy much of the central and eastern portion of the parcel. In the eastern, rocky but somewhat sheltered slopes, the vegetation was mapped as lower Mojave mixed woody scrub, a fine-textured mosaic with no one species dominant. A small amount of Joshua tree/creosote bush woodland was mapped in the southern portion of the parcel. The barren area in the central portion of the parcel had low cover, but a relatively high diversity of perennial species, including chaparral yucca, and many species of buckwheat. The eastern wash supported some scalebroom, with allscale, rubber rabbitbrush, green ephedra, and some Joshua tree, suggesting only occasional flooding.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. In terms of potential for special-status plants, open sandy or gravelly flats could support crowned muilla; Death Valley sandmat and blazing star could occur in canyons, rock outcrops and washes; Charlotte's phacelia, limestone dudleya and Mojave fish hook cactus in the loose gravel or talus and rock outcrops in the higher uplands.

Disturbance factors. As indicated in the introduction to this parcel, two designated roads pass through Parcel A-8. Another track is shown on the USGS Cinco quadrangle. However, airphotos

show a high concentration of tracks in the broad and generally level washes, both along Alphie Canyon and along Butterbredt Canyon Road.

3.3.5 Butterbredt Area Parcels

Parcel B-1 (APN 153-070-05)

This 632-acre parcel is located at the head of Butterbredt Canyon, less than a mile west of Gold Peak. Butterbredt Canyon Road (SC 123) passes through the parcel, as does Gold Peak Road (SC 124); the two join just west of Parcel B-1. The Pacific Crest Trail skirts this parcel on the north and western sides. This parcel contains a ridge of Gold Peak that divides two watersheds; the southern portion drains down Butterbredt Canyon into Jawbone Canyon, while the northern portion drains toward Kelso Creek and eventually to the South Fork of the Kern River. Although watercourses are mapped on the USGS Pinyon Mountain quadrangle, these appear to be ephemeral drainages that carry water only briefly during and after major storm events. The elevation range for Parcel B-1 is 560 feet, from 5,000 feet to 5,560 feet on the shoulder of Gold Peak. The soils mapped here are essentially all Grandora-Pinyonpeak association; these are soils formed in colluvium or residuum weathered from granite.

Vegetation resources. Joshua tree woodland was mapped nearly throughout Parcel B-1, with varying shrub understory elements. The south-facing slopes supported Joshua tree/blackbrush woodland, while the north-facing slope of the same ridge had Joshua tree/big sage woodland; this was a diverse area with green ephedra, bitterbrush, spiny hopsage and other shrub and perennial grass species. The highest and most exposed slope supported Joshua tree/California buckwheat woodland, and the deeper soil in the upper valley supported Joshua tree/upper Mojave mixed woody scrub woodland. Some rock outcrops supported only California buckwheat with no Joshua tree, but these were limited in extent.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Open, sandy or gravelly flats could support white pygmy-poppy, Kern County evening-primrose and crowned muilla; sandy washes could support Death Valley sandmat; rocky outcrops and gravel or talus slopes could support limestone dudleya and Charlotte's phacelia.

Disturbance. Based on reconnaissance survey and examination of airphotos, this parcel receives regular use on designated routes, but appeared to have limited off-route tracks. No unusual invasive plant infestations were noted.

Parcel B-2 (APN 153-140-08)

This 317-acre parcel is located in the upper portion of Butterbredt Canyon, about a mile south of Gold Peak. Butterbredt Canyon Road (SC 123) passes through the parcel, parallel to a drainage that is probably ephemeral and flows only during and immediately following major storm events. The elevation range for Parcel B-2 is 610 feet, from 4,720 to 5,360 feet. The soils in Parcel B-2 are Grandora-Pinyonpeak association and Goldpeak-Pinyonpeak-Wingap complex; both are soils formed on fans, hills and rocks of granitic origin.

Vegetation resources. Most of Parcel B-2 supported Joshua tree woodland with various understory shrub components. The deepest soils in the central part of Butterbredt Canyon supported Joshua tree/upper Mojave mixed woody scrub woodland, a diverse assemblage containing flat-topped buckwheat (*Eriogonum deflexum* var. *deflexum*), western desert penstemon (*Penstemon incertus*), grape lupine, and Cooper's box thorn, among others. The lower slopes supported Joshua tree/blackbrush woodland, lower in diversity than the preceding but with

considerable desert needlegrass. The higher rocky environments supported Joshua tree/California buckwheat woodland. The highest north-facing rocky slopes supported California buckwheat scrub alone.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Open, sandy or gravelly flats could support white pygmy-poppy, Kern County evening-primrose and crowned muilla; sandy washes could support Death Valley sandmat; rocky outcrops could support limestone dudleya.

Disturbance factors. The site visit and aerial photography were consistent in indicating a low level of disturbance from vehicles in this parcel.

Parcel B-3 (APN 153-140-07)

This 320-acre parcel is located in the upper portion of Butterbredt Canyon, about a mile south of Gold Peak. Butterbredt Canyon Road (SC 123) passes through the southwestern corner of the parcel. The USGS Pinyon Mountain quadrangle shows other tracks crossing this parcel from south to north toward Gold Peak, but these currently are not designated roads. This parcel slopes moderately but steadily to the south, with one mapped watercourse draining due south from Gold Peak and another draining southeastward in the southern portion of the parcel; these appear to be ephemeral, flowing only during and immediately following major rainfall events. The elevation range for Parcel B-3 is 600 feet, from 4,600 to 5,200 feet. The soils in Parcel B-3 are Grandora-Pinyonpeak association and Goldpeak-Pinyonpeak-Wingap complex; both are soils formed on fans, hills and rocks of granitic origin.

Vegetation resources. Joshua tree woodland was present throughout Parcel B-3 with several understory shrub elements. The lowest part of Butterbredt Canyon supported Joshua tree/ upper Mojave mixed woody scrub woodland, a rich variety of shrubs containing western desert penstemon, Nevada ephedra, flat-topped buckwheat, Cooper's box thorn and Anderson thornbush (*Lycium andersonii*). The extensive slopes to the north and a little to the south of the canyon floor supported Joshua tree/blackbrush woodland. A small area of steeper, north-facing slopes in the southern part of the parcel contained Joshua tree/California buckwheat woodland. The rocky gravel soils throughout the parcel contained a sparse but fairly diverse assemblage of herbs, including desert calico (*Loeseliastrum matthewsii*), Pringle eriophyllum (*Eriophyllum pringlei*), coreopsis (*Leptosyne (=Coreopsis) bigelovii*), and winged pectocarya (*Pectocarya penicillata*).

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Open, sandy or gravelly flats could support white pygmy-poppy, Kern County evening-primrose and crowned muilla; sandy washes could support Death Valley sandmat; rocky outcrops and talus or gravelly slopes could support limestone dudleya and Charlotte's phacelia.

Disturbance factors. A limited amount of evidence of off-route OHV use was noted in this parcel. No infestations of invasive weeds were noted.

Parcel B-4 (APN 153-160-02)

This 636-acre parcel is located farther down Butterbredt Canyon, and Butterbredt Canyon Road (SC 123) passes through the southwestern portion of the parcel. This parcel slopes steadily but moderately to the south-southeast, with several ephemeral drainages joining the main drainage in the parcel. Butterbredt Well is shown in the parcel on the USGS Pinyon Mountain quadrangle, but this water development is not currently operational. The elevation range of Parcel B-4 is 720

feet, from 4,320 to 5,040 feet. The soils in Parcel B-4 are almost all Goldpeak-Pinyonpeak-Wingap complex, soils formed on fans, hills and rocks of granitic origin.

Vegetation resources. The deeper soils in the canyon floor supported Joshua tree/upper Mojave mixed woody scrub woodland with a rich mix of rubber rabbitbrush, blackbrush, Cooper's box thorn, and horsebrush. Some of the west- and south-facing uplands supported Joshua tree/blackbrush woodland, while large areas supported blackbrush scrub alone.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Open, sandy or gravelly flats could support white pygmy-poppy, Kern County evening-primrose and crowned muilla; sandy washes could support Death Valley sandmat; gravel or talus slopes could support Charlotte's phacelia.

Disturbance factors. The site of Butterbredt Well, located in the southern portion of the parcel, consisted of a disturbed area where the well was located and old equipment remained, while the east side had a large stock tank that was being taken over by rubber rabbitbrush, a native invader of disturbed sites. Some non-native weeds were noted around the stock tank, such as horehound (*Marrubium vulgare*) and farmer's foxtail (*Hordeum murinum* ssp. *leporinum*), but these did not appear to be invading nearby undisturbed areas.

Parcel B-5 (APN 153-160-06)

This 323-acre parcel is located on the steep western slopes of Butterbredt Canyon, about 3 miles south of Gold Peak and 2.5 miles northwest of Butterbredt Springs. It has no access by designated roads. The elevation range of this parcel is 700 feet, from 4,500 to 5,200 feet. The soils in Parcel B-5 are Goldpeak-Pinyonpeak-Wingap complex, soils formed on fans, hills and rocks of granitic origin.

Vegetation resources. A broad band of Joshua tree/blackbrush woodland covered some of the gentle, lower slopes of this parcel. The remainder was mapped as blackbrush scrub.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Open, sandy or gravelly slopes could support white pygmy-poppy and Kern County evening-primrose; sandy slopes could support Death Valley sandmat; rocky outcrops could support limestone dudleya.

Disturbance factors. The USGS Dove Spring quadrangle shows a track passing through the parcel from south to north, traversing the slope. Traces of this track and another, leading from Butterbredt Well, may be seen on airphotos, as well as a few others. Overall, the disturbance from OHV and/or livestock use is light on this parcel. No weed infestations were noted.

Parcel B-6 (APN 153-160-04)

This 639-acre parcel is located on the east side of Butterbredt Canyon, with a very short portion of the designated road (SC 123) passing through the southwestern corner of the parcel. This parcel includes a portion of the ridgeline dividing Butterbredt and Alphie Canyon; most of the parcel slopes rather steeply to the southwest toward Butterbredt Canyon. Several ephemeral watercourses are shown on the parcel on the USGS Pinyon Mountain quadrangle. Although they have defined bed and bank, they most likely flow only during and following significant rainfall events. The elevation range for Parcel B-6 is 750 feet, from 4,060 to 4,818 feet. The soils in Parcel B-6 are Goldpeak-Pinyonpeak-Wingap complex, soils formed on fans, hills and rocks of granitic origin.

Vegetation resources. Almost all of the parcel was mapped as Joshua tree/blackbrush woodland. The Joshua trees were of varying density and cover, and in a few areas they were so sparse that the area was mapped as blackbrush scrub. Shrub diversity was fairly high, as is typical in Joshua tree/blackbrush; typical associates included Nevada ephedra, green rabbitbrush, and cheesebush in the lower areas. The wash contained a mix of cheesebush, green rabbitbrush, and rubber rabbitbrush, and the side slopes supported rock goldenbush, Acton's encelia, and grape lupine.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Open, sandy or gravelly flats could support white pygmy-poppy, Kern County evening-primrose and crowned muilla; sandy washes could support Death Valley sandmat; steep gravel or talus slopes could support Charlotte's phacelia.

Disturbance factors. The USGS Dove Spring quadrangle shows a four-wheel drive track along the ridgeline on the eastern side of Parcel B-6, and a perpendicular track leading up to the ridge from Butterbredt Canyon. These are plainly evident on airphotos, as are some other tracks on the ridgeline and in the lower portions of Butterbredt Canyon. No invasive weed infestations were noted.

Parcel B-7 (APN 153-180-04)

This 200-acre parcel is situated on the very steep southeastern slopes of Butterbredt Peak. It is located about a half-mile north and upslope from upper Jawbone Canyon Road, but contains no designated roads. The elevation range for this parcel is almost 1,000 feet, from 4,420 feet to 5,409 feet. The soils in Parcel B-7 are Wingap-Pinyonpeak association, soils formed on granite rocks.

Vegetation resources. Because this parcel is situated on a high, exposed slope, most of the parcel supported California buckwheat scrub. A gentler south-facing slope with deeper soil was mapped as having Joshua tree woodland with upper Mojave mixed woody scrub understory. A southwest-facing slope on the lower slopes of the parcel was mapped as supporting blackbrush scrub.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Open, sandy washes or slopes could support Death Valley sandmat; rocky outcrops could support limestone dudleya.

Disturbance factors. The USGS Pinyon Mountain quadrangle shows a track passing through this parcel from Jawbone Canyon Road at Hoffman Grade along the mid-slope of Butterbredt Peak. This track is clearly evident in the field and on airphotos, as are other, recent tracks leading to Butterbredt Peak. This parcel appeared to be at risk of erosion because of the thin vegetation cover, steep slopes, and loose soils. No weed infestations were noted.

Parcel B-8 (APN 153-180-02)

This 80-acre parcel is located on the lower slopes of Butterbredt Peak, on the western side of Butterbredt Canyon. The parcel slopes moderately steeply to the east, has no designated roads, and no recorded drainages. The elevation range for Parcel B-8 is 360 feet, from 4,140 to 4,500 feet. The soils in Parcel B-8 are Wingap-Pinyonpeak association, soils formed on granite rocks.

Vegetation resources. This parcel was mapped as having entirely blackbrush scrub. Although scattered Joshua trees were present, they did not contribute 1 percent cover.

Special-status plant resources. Open, sandy or gravelly flats could support Kern County evening-primrose and crowned muilla; sandy slopes or washes could support Death Valley sandmat.

Disturbance factors. No tracks were shown through the parcel on the USGS Pinyon Mountain quadrangle, and no tracks were obvious on the reference airphotos for the project. Thus, human disturbance on this parcel was concluded to be light.

Parcel B-9 (APN 153-180-12)

This 80-acre parcel is located at the point where Butterbredt Canyon narrows from the broad uplands to a more confined canyon. Butterbredt Canyon Road (SC 123) touches the western side of this parcel, but otherwise it is roadless. Butterbredt Spring is a developed feature with a stock pond and watering basins for livestock, but the canyon bottom also has natural springs that provide surface or near-surface water perennially. The slopes on either side of the canyon are moderately steep, and the elevation range for the parcel is 280 feet, from 3,720 to 4,000 feet. The soils in Parcel B-9 are Wingap-Pinyonpeak association, soils formed on granite rocks.

Vegetation resources. Butterbredt Spring is probably the best-known desert spring feature in the eastern acquisition area. Although the riparian area in Parcel D-2 on Dove Spring Canyon may be larger, Butterbredt Spring has a developed and maintained pond, and the presence of surface water creates considerable plant diversity and wildlife habitat. In addition to Fremont cottonwood and three species of willows, the riparian habitat included mule fat and desert baccharis. A pond, too small to map, was noted in the riparian area; it supported cattails and iris-leaved rush, while the peripheral moist areas supported yerba mansa (*Anemopsis californica*), rushes and salt grass. Downstream from Butterbredt Spring, the wash supported rubber rabbitbrush scrub. The southwest-facing slope above Butterbredt Spring was mapped as Joshua tree/blackbrush woodland, as were most of the upper slopes on the northeast side of the canyon. An upland slope on the northeast-facing side of Butterbredt Canyon was mapped as blackbrush scrub only.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Also sensitive are the desert riparian, meadow and seep, and pond habitats, which are rare in the Mojave Desert. Death Valley sandmat was observed in this parcel, in the wash below the spring, as well as on the road just to the west of Parcel B-9. The alkaline seep in the wash below the spring could provide habitat for Mojave tarplant and alkali mariposa-lily, although these were searched for and not found in 2012. Open, sandy or gravelly flats could support Kern County evening-primrose.

Disturbance factors. OHV use at Butterbredt Spring has been curtailed by fencing around the area; human access is still possible on foot, and this site is a popular destination for birdwatchers. Maintenance is needed to keep open water habitat in the pond, and other maintenance may also be required to keep the water development functioning. Project airphotos show traces of former OHV activity in and around this parcel.

Just outside the parcel boundary on Butterbredt Canyon Road was a stand of tree-of-heaven (*Ailanthus altissimus*), a woody species that is highly invasive in riparian habitats. Although this species was not seen in Parcel B-9 or any other EKCA parcel, its potential to spread presents a risk to the ecological values of Butterbredt Spring.

Parcel B-10 (APN 153-170-01)

This 640-acre parcel includes the ridgeline between Butterbredt and Alphie canyons, about 2 miles north of the confluence of these features. There are no designated roads in the parcel, although the USGS Dove Spring quadrangle indicates the presence of an historic track to a

ridgeline peak just north of Parcel B-10. Most of the parcel slopes moderately steeply to the south toward Butterbredt Canyon, with two canyons that probably contain springs. The southwestern corner of Parcel B-10 contains a portion of Butterbredt Canyon, with a wide desert wash and some desert riparian habitat. The elevation range for this parcel is 920 feet, from 3,640 to 4,760 feet. The soils in Parcel B-10 are Wingap-Pinyonpeak association, soils formed on granite rocks.

Vegetation resources. The great majority of the steep uplands in Parcel B-10 were mapped as blackbrush scrub. However, the slopes facing and immediately adjacent to Butterbredt Canyon were mapped as Joshua tree/blackbrush woodland. Butterbredt Canyon itself was mapped as having several small areas of desert riparian forest and scrub; these were thickets of willow along the watercourse. Between these stands were a few patches of rush and salt grass, but most of the wash was covered with a fairly dense stand of rubber rabbitbrush. The parcel contained two side canyons mapped as desert wash, and one had a small area of desert riparian forest and scrub at a spring.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Also sensitive are the desert riparian and meadow and seep habitats, which are rare in the Mojave Desert. Death Valley sandmat was observed in the wash in this parcel. The alkaline seeps in the wash could provide habitat for Mojave tarplant and alkali mariposa-lily, although these were searched for and not found in 2012. Open, sandy or gravelly flats could support Kern County evening-primrose and crowned muilla. Rocky outcrops and gravel or talus slopes below the outcrops could support limestone dudleya and Charlotte's phacelia

Disturbance factors. The Dove Spring quadrangle shows a track along the ridgeline on the eastern portion of Parcel B-10; this is evident on airphotos. A few other tracks are evident in airphotos, and this parcel was concluded to have low to moderate human disturbance. No invasive plants were noted in the parcel. The effects of cattle grazing were evident in this parcel, which, unlike Parcel B-9, is not fenced. Plenty of cattle tracks and a lone cow were observed near the riparian area during field surveys.

3.3.6 Kelso Valley Area Parcels

Parcel K-1 (APN 153-080-02)

This 320-acre parcel is situated at the northern end of Kelso Valley. The southern end of the parcel is situated on the upper slopes of the valley floor, then rises steeply toward St. John Ridge. Two ranch roads provide access to the southern end of the parcel and a spring and stock pond. Several drainages are indicated on the USGS Pinyon Mountain quadrangle, but these are ephemeral due to the extremely steep slopes. The elevation range of Parcel K-1 is over 1,300 feet, from 4,480 to 5,800 feet. The soils on the extremely steep slopes are Xyno-Rock Outcrop-Canebrake association, the lower slopes are Chollawell and Inyo soils, all formed over granite rock or in granitoid alluvium.

Vegetation resources. The upper slopes of Parcel K-1 were mapped as rocky outcropping and California buckwheat scrub. The middle slopes were mapped as Wright's buckwheat scrub, a mid-elevation species of alluvial fans. Interspersed with Wright's buckwheat scrub were fingers of rubber rabbitbrush scrub extending up the draws in deeper soils. In canyons at the top of the alluvial fans were several areas of coffeeberry scrub, an unusual type was associated with subsurface water or springs. The westernmost spring supported willows and had a developed pond below it; these were too small to map but were adjacent to the westernmost coffeeberry

scrub. Desert riparian forest and scrub was mapped as a small polygon in a canyon midway up the steep slope.

Special-status plant resources. Wright's buckwheat scrub is state-ranked S3, meaning it is a sensitive natural community. Desert riparian forest and scrub is rare in the survey area and is a sensitive natural community. The pond, even though man-made, provides important habitat for many species. Finally, the coffeeberry scrub, although not considered rare statewide, is a locally-unique riparian habitat.

In terms of special-status plants, a small area of Death Valley sandmat was mapped in the open sandy rabbitbrush scrub in the lower portion of the parcel. This species is likely to occur elsewhere in Parcel K-1. Other species likely to be encountered on the sandy to gravelly soils of the lower slopes and fans include Kern County evening-primrose, white pygmy-poppy, Kern Canyon clarkia, Kelso Creek monkeyflower, and crowned muilla. Rocky outcrops could support limestone dudleya, and moist habitats around the ponds, seeps and springs could support Mojave tarplant.

Disturbance factors. This parcel has two developed and maintained ranch roads and a developed pond, as well as other evidence of past human use. No OHV tracks were noted. The main disturbance factor in much of Kelso Valley is wildfire, and this parcel had ample evidence; several different single-age stands of rubber rabbitbrush were present in this parcel, each following a wildfire event.

Parcel K-2 (APN 153-080-08)

This 322-acre parcel is adjacent to Parcel K-1 and is situated on the northern end of Kelso Valley. Similar to that parcel, K-2 rises from the alluvial fans surrounding Kelso Valley to the extremely steep and rugged south-facing slopes of St. John Ridge. Access to this parcel is limited to a ranch road passing through its southwestern corner. Several drainages are indicated on the USGS Pinyon Mountain quadrangle, but these are ephemeral due to the extremely steep slopes. The elevation range of Parcel K-2 is 1,250 feet, from 4,390 to 5,640 feet. The soils on the extremely steep slopes are Xyno-Rock Outcrop-Canebrake association, the lower slopes are Chollawell and Inyo soils, all formed over granite rock or in granitoid alluvium.

Vegetation resources. The upper slopes of Parcel K-2 were mapped primarily as rocky outcropping with smaller areas mapped as California buckwheat scrub. The middle slopes were mapped as Wright's buckwheat, a mid-elevation species of alluvial fans. Rubber rabbitbrush scrub extended up the draws in deeper soils. Similar to Parcel K-1, an area of coffeeberry scrub was mapped in one of the more sheltered, deeper draws. A long strip of Joshua tree woodland with rubber rabbitbrush understory was mapped on one of the eastern draws.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Wright's buckwheat scrub is also state-ranked S3, meaning it is a sensitive natural community. The coffeeberry scrub, although not considered rare statewide, is a locally-unique riparian habitat.

In terms of special-status plants, a small area of Death Valley sandmat was mapped in the open sandy rabbitbrush scrub in the lower portion of the parcel. This species is likely to occur elsewhere in Parcel K-2. Other species likely to be encountered on the sandy to gravelly soils of the lower slopes and fans include Kern County evening-primrose, white pygmy-poppy, Kern Canyon clarkia, Kelso Creek monkeyflower, and crowned muilla. Rocky outcrops could support limestone dudleya.

Disturbance factors. As with Parcel K-1, different single-age stands of rubber rabbitbrush are indications of past wildfires. A lightly used ranch road passes through the southwestern corner of this parcel; otherwise, no evidence of tracks or other human disturbance was noted.

Parcel K-3 (APN 153-070-03)

This 40-acre parcel is located midway from the floor of northern Kelso Valley to the eastern ridgeline. No road access is available for this parcel, but the Pacific Crest Trail passes on the ridge line about 0.2 mile to the east and 300 feet higher in elevation. The parcel slopes moderately steeply to the west and south toward Kelso Valley and includes one ephemeral drainage. The elevation range for Parcel K-3 is only 160 feet, from 4,680 to 4,840 feet. The soils are Chollawell-Inyo complex, soils formed on fan remnants from granite sources.

Vegetation resources. The entirety of this relatively small parcel was mapped as Joshua tree/blackbrush woodland. A desert wash was also mapped in the northwest corner.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Several special-status plants have potential to occur in Parcel K-3.The sandy to gravelly soils of the lower slopes and fans could support Death Valley sandmat, Kern County evening-primrose, white pygmy-poppy, Kern Canyon clarkia, Kelso Creek monkeyflower, and crowned muilla.

Disturbance factors. Wildfire appears to be less frequent on the eastern side of Kelso Valley. No roads or tracks were evident on maps, photos, or visual inspection of this parcel. Disturbance from any cause was low on this parcel.

Parcel K-4 (APN 153-070-02)

Although considered one of the Kelso Valley group of parcels, this 321-acre parcel is situated mostly on the north and eastern side of the ridgeline separating Kelso Creek (which drains to the South Fork Kern River) from Kelso Valley. Butterbredt Canyon Road (SC 123) passes through the northeastern corner of the parcel; the Pacific Crest Trail passes through the southern portion of the parcel along the ridgeline. This site slopes fairly steeply to the north, with one well-defined, ephemeral drainage draining northward. This is a rocky site, with extensive granite outcroppings. The elevation range for the parcel is 620 feet, from 4,620 to 5,240 feet. The soils mapped here are all Grandora-Pinyonpeak association; these are soils formed in colluvium or residuum weathered from granite.

Vegetation resources. The lower, north-facing slopes of Parcel K-4 were mapped as big sage scrub. Although dominated by big sage, this area was a relatively rich mix of bitterbrush, ephedra and desert needlegrass, among others. The higher north-facing slopes were mapped as singleleaf pinyon pine woodland. Still rockier and more exposed slopes near the ridgeline were mapped as California buckwheat scrub. The two largest drainages were mapped as desert wash; they were generally unvegetated.

Special-status plant resources. Death Valley sandmat was mapped in the open sandy bottom of the north-draining draw in the northern portion of Parcel K-4. This species could occur elsewhere in this parcel in suitable habitat. Other species likely to be encountered on the sandy to gravelly soils include Kern County evening-primrose, white pygmy-poppy, Kern Canyon clarkia, Kelso Creek monkeyflower, and crowned muilla. Because of the extensive big sage habitat, this parcel may also contain habitat for intermontane lupine.

Disturbance factors. Butterbredt Canyon Road passes through the northwest corner of this parcel; other than this, and the nearby Pacific Crest Trail, we did not observe other indications of off-road travel or other disturbance. No invasive plant infestations were noted.

Parcel K-5 (APN 153-080-05)

This 160-acre parcel is situated on alluvial fans at the northern end of Kelso Valley. Accessible by a ranch road, this parcel slopes very gently to the southeast, with a couple of draws dissecting the alluvial fans. The elevation range for Parcel K-5 is only 150 feet, from 4,240 to 4,390 feet. The soils in this parcel are Inyo-Riverwash, Inyo, and Chollawell, all coarse soils formed on stream terraces, alluvial fans, and alluvium from mixed rocks.

Vegetation resources. Most of the high, broad terrace comprising this parcel was mapped as rubber rabbitbrush scrub. An area in the south of the parcel was mapped as big sage scrub; this was evidently an area spared from wildfire. The footprint of a more recent wildfire in the center of the parcel was mapped as annual grassland dominated by cheatgrass. The rocky slopes on the western side of the parcel were mapped as California buckwheat scrub, and a lower alluvial fan on the eastern side was mapped as Joshua tree/rubber rabbitbrush woodland. This area evidently has not burned recently.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Special-status plant species likely to be encountered on the sandy to gravelly soils include Kern County evening-primrose, white pygmy-poppy, Death Valley sandmat, Kelso Creek monkeyflower, and crowned muilla.

Disturbance factors. Parcel K-5 has ranch roads passing through it, some of which appear not to be in current use. The airphotos and field reconnaissance indicated little if any OHV trails. Wildfire is a major disturbance factor in this area, as indicated by several different even-age stands of rabbitbrush.

Parcel K-6 (APN 153-080-04)

This 640-acre parcel occupies the center of northern Kelso Valley. Kelso Valley Road bisects the parcel from north to south, and bajadas rise from the valley floor to the northeast. Several defined drainages drain toward the center of Kelso Valley, but these are generally ephemeral and are dry washes most of the time. The elevation range for this parcel is 420 feet, from 4,220 feet at the valley floor to 4,643 feet at the top of a knoll on the eastern side. The soils in this parcel are mostly Chollawell-Inyo complex, with some Inyo-Riverwash soils in the main drainage. These soils are formed in fan remnants and alluvium, mostly from granite parent material.

Vegetation resources. The lowest elevation areas of this parcel supported an unusually dense stand of Joshua tree/rubber rabbitbrush woodland. Farther upslope, the Joshua trees were sparse and the areas were mapped as rubber rabbitbrush only. On the higher alluvial fans, blackbrush scrub, sometimes with a Joshua tree overstory, predominated. Also present on old terraces between the drainages in the lower portion of the parcel were areas dominated by California buckwheat.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Special-status plant species likely to be encountered on the sandy to gravelly soils include Kern County evening-primrose, white pygmy-poppy, Death Valley sandmat, Kelso Creek monkeyflower, and crowned muilla.

Disturbance factors. In addition to Kelso Valley Road, this parcel contains some ranch roads that serve the western side of Kelso Valley. Other than these, evidence of vehicle impacts appeared to be very limited.

Parcel K-7 (APN 153-070-07)

This 640-acre parcel is located on the eastern side of Kelso Valley and extends from the upper slopes to an unnamed, very rugged and rocky peak separating Kelso Valley from Butterbredt Canyon to the east and the Kelso Creek watershed to the north. No roads approach this rough country; Kelso Valley Road is about 1.6 miles to the west. The elevation range for Parcel K-7 is over 1,500 feet, from 4,270 to 6,274 feet. The soils mapped here are almost entirely Grandora-Pinyonpeak association; these are soils formed in colluvium or residuum weathered from granite. The lower slopes contain a little Chollawell-Inyo complex, and the upper slopes Wingap-Pinyonpeak soils. All are associated with granite parent material.

Vegetation resources. Due to the extremely rugged terrain, the vegetation in nearly half of Parcel K-7 was very sparse California buckwheat scrub. A little Joshua tree/California buckwheat woodland was mapped in the southeastern corner of the parcel, while the western areas on lower, gentler slopes were blackbrush scrub and Joshua tree/blackbrush woodland.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Special-status plant species likely to be encountered on the sandy to gravelly soils include Kern County evening-primrose, white pygmy-poppy, Death Valley sandmat, Kelso Creek monkeyflower, and crowned muilla. Rocky slopes could support limestone dudleya, and open alluvial areas could support Tracy's eriastrum.

Disturbance factors. Due to the rugged terrain and remoteness of the site, no ranch roads, OHV trails, or tracks of any kind were observed on the USGS Pinyon Mountain quadrangle or the airphotos used in field surveys.

Parcel K-8 (APN 153-030-05)

This 640-acre parcel is situated on the uppermost slopes of western Kelso Valley, and includes 7,704-foot Sorrell Peak, the highest peak surrounding Kelso Valley and the highest point in the survey area. A logging road touches Parcel K-8 along the western ridgeline in several points but no road access exists throughout most of this extremely steep and rugged east-facing slope. Parcel K-8 is the headwaters for Water Canyon, a perennial stream extending for nearly 3 miles before disappearing into the deep alluvium in Kelso Valley. The elevation range for Parcel K-8 is over 1,400 feet, from 5,280 to 7.704 feet. The soils here are almost all Sorrell-Martee-Rock Outcrop association; these are soils formed in residuum weathered from granitoid rocks.

Vegetation resources. This parcel was mapped as having Jeffrey pine forest on the very steep upper slopes and interior live oak on the lower, but still steep and rocky, slopes. The Jeffrey pine forest had scattered white fir, sugar pine, and ocean spray (*Holodiscus discolor)*, species typical of high mountain forests. The relatively sparse cover in the interior live oak mapping unit suggested a relatively recent fire had occurred and the live oaks were sprouting afterward. Although cover was limited, this species would be expected to eventually develop into a closed-canopy forest in the absence of fire. It is likely that riparian habitat is present along the steep drainages in Parcel K-8, but these could not be investigated during 2012 surveys.

Special-status plant resources. This parcel could not be surveyed in detail for special-status plants, but the elevation range and variety of aspects provided in this rugged terrain suggest the possible occurrence of a number of species. The rock outcrops and talus slopes could provide habitat for Spanish Needle onion. Moist meadows along watercourses could support Palmer's mariposa-lily and Transverse Range phacelia. Rock outcrops could support unexpected larkspur and limestone dudleya, while shaded slopes could support pine fritillary. Open, gravelly areas could provide habitat for Tracy's eriastrum and Kern County evening-primrose. The lower, chaparral and woodland could contain habitat for Tehachapi monardella and fragile pentachaeta.

Disturbance factors. Aside from a forest road along the upper, western edge of the parcel, the rugged terrain precludes the development of roads and tracks in this parcel. It was concluded to have low levels of human disturbance. However, wildfire is clearly an important disturbance factor on the eastern slopes of Piute Mountain.

Parcel K-9 (APN 153-100-03)

This 640-acre parcel is located on the western slopes of Kelso Valley, 2 miles east of Sorrell Peak. It is located on moderately sloping, dissected bajadas above the valley floor and contains two significant watercourses, Water Canyon and Esperanza Creek. Ranch roads provide access to the center of the parcel and the northeastern corner. The elevation range of Parcel K-9 is about 500 feet, from 4,175 to 4,680 feet. The mapped soils for this parcel are fairly complex; most of the central portion slope is mapped as Chollawell, cobbly and gravelly complex, with Kernville-Faycreek Rock Outcrop on the higher slopes and Inyo gravelly loam on the lower slopes. The main drainage through the parcel is Inyo-Riverwash. These soils range from those formed over granitic parent material to those formed in cobbly colluvium, finer-textured alluvial fans, and floodplains, but all are of granitic origin.

Vegetation resources. This parcel had extensive evidence of recent fire; the central areas of big sage scrub were the unburned areas, while the adjacent rubber rabbitbrush scrub represented vegetation development several years following a fire. The hillsides on the southern portion of the parcel were mapped as wedge leaf ceanothus scrub, which is a successional type that would eventually be replaced by interior live oak. The Joshua tree/rabbitbrush woodland in the eastern part of the parcel represented an area that has not experienced major fire for a long time. The desert riparian scrub in this parcel was well developed, because Water Canyon flows as a perennial stream well into the deep alluvium of Kelso Valley; along it, nearly a half-mile of willows and other species such as desert olive grew abundantly. Desert olive was also mapped as a dominant riparian type along Esperanza Creek in the northwest corner of the parcel. Gray pine woodland followed the deep alluvium along another watercourse in the northern portion of Parcel K-9.

Special-status plant resources. Sensitive natural communities in Parcel K-9 include Joshua tree woodland, desert riparian forest and scrub, and desert olive riparian scrub. This was the only parcel with a mapped example of desert olive scrub.

A number of special-status plants could occur in this parcel, especially in light of the elevation range, variety of slopes and exposures, and the presence of seeps, springs, and streams. Parcel K-9 had a CNDDB record (Occ. 13) of Kelso Creek monkeyflower, and a record for Palmer's mariposa-lily in the next section to the west (Occ. 66). This occurrence record was verified during field surveys, and an isolated individual Palmer's mariposa-lily was also observed within Parcel K-9 on a stream terrace. Somewhat moist stream terraces and seeps also could provide habitat for Mojave tarplant, which is known from two records on the adjacent section (CNDDB occs. 67 and 68), as well as Mojave paintbrush. In addition to these known localities, the lower-elevation

gravelly and sandy flats could contain habitat for white pygmy-poppy, Kern County evening-primrose, crowned muilla, Kern Canyon clarkia and Death Valley sandmat. Higher slopes and flats could provide habitat for intermontane lupine and Transverse Range phacelia. Rocky outcrops could support limestone dudleya.

Disturbance factors. Fire is an ongoing disturbance factor on the west side of Kelso Valley. Several ranch roads cross the lower bajadas, but end at the base of the steep foothills of Piute Mountain. No evidence of off-road vehicle activity was noted in this parcel.

Parcel K-10 (APN 153-090-01)

This 640-acre parcel is located on the eastern side of Kelso Valley, on moderately sloping to fairly steep bajadas. The nearest access, then, is Kelso Valley Road, about 1.2 miles to the west. The elevation range for Parcel K-10 is 520 feet, from 4,180 to 4,700 feet. Soils are almost entirely Chollawell-Inyo complex, formed on fan remnants of granitic material. Some finer-textured soils are present at the lower elevations near the bottom of Kelso Valley.

Vegetation resources. The great majority of this parcel was mapped on the mid- to upper slopes as Joshua tree/blackbrush woodland. Nearer the valley floor, Joshua tree combined with rubber rabbitbrush as the primary understory species. The wash in the northwest corner was mapped as desert wash, but may have only an unvegetated channel.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Special-status species likely to be encountered on the sandy to gravelly soils of the lower flats, slopes and fans include Kern County evening-primrose, white pygmy-poppy, Death Valley sandmat, Kern Canyon clarkia, Kelso Creek monkeyflower, intermontane lupine, Tracy's eriastrum, and crowned muilla. Rocky outcrops could support limestone dudleya.

Disturbance factors. The USGS Pinyon Mountain quadrangle shows a track on the eastern side of this parcel traversing the slope up to the ridgeline; several other tracks traverse the parcel from east to west and north to south.

Parcel K-11 (APN 153-090-03)

This 640-acre parcel is situated on the ridgeline separating Kelso Valley from Butterbredt Canyon. It contains steep and rugged terrain, rising 1,000 feet from 4,800 feet on the upper slopes of Kelso Valley to the ridgeline peaks at 5,803 feet. About one-fourth of the parcel drains toward Butterbredt Canyon, while the remainder drains toward Kelso Valley. The USGS Pinyon Mountain quadrangle shows several ephemeral watercourses draining to the east, south and west. The soils in Parcel K-11 are Wingap-Pinyonpeak association, soils formed on granite rocks.

Vegetation resources. The highest and most exposed portions of the ridgetop were mapped as California buckwheat scrub, while lower areas were mapped as blackbrush scrub, Joshua tree/blackbrush woodland, and Joshua tree/California buckwheat woodland.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Special-status likely to be encountered on the sandy to gravelly soils of the lower slopes and fans include Kern County evening-primrose, white pygmy-poppy, Death Valley sandmat, and Kelso Creek monkeyflower. Rocky outcrops could support limestone dudleya.

Disturbance factors. Although one track was noted crossing the ridgeline from Butterbredt Canyon to Kelso Valley, the overall level of disturbance on this parcel appeared to be light.

Parcel K-12 (APN 153-100-13)

This 603-acre parcel is located on the western side of Kelso Valley, rising from mid-slope to the ridgeline to the west. This parcel is accessible only at the upper portion from some lightly used roads that provide access to a mine on the upper ridgeline. The slope generally descends in an eastward direction, although the slope also contains several prominent ridges. Several drainages and a spring are indicated on the USGS Claraville quadrangle. The elevation range for this parcel is over 2,100 feet, from 4,600 to 6,760 feet. The soils here are almost all Sorrell-Martee-Rock Outcrop association; these are soils formed in residuum weathered from granitoid rocks.

Vegetation resources. The great majority of this parcel was mapped as interior live oak woodland, on the upper slopes and the main north-facing lower slopes. Dense singleleaf pinyon pine woodland was mapped in the central north-facing slope, and California juniper woodland was mapped on the exposed south-facing slopes.

Special-status plant resources. The tremendous elevation range and variety of aspects provided in this rugged terrain suggest the possible occurrence of a number of species. The rock outcrops and talus slopes could provide habitat for Spanish Needle onion at the higher elevations and possibly limestone dudleya at the lower elevations. Moist meadows, seeps and springs along watercourses could support Palmer's mariposa-lily, Mojave tarplant and Transverse Range phacelia. Shaded slopes could support pine fritillary. The lower chaparral and woodland could contain habitat for Tehachapi monardella.

Disturbance factors. There is little evidence of human disturbance within Parcel K-12. Fire is a frequent disturbance factor on the western side of Kelso Valley and the eastern side of Piute Mountain.

Parcel K-13 (APN 153-100-10)

This 640-acre parcel is located in the valley floor of Kelso Valley. Kelso Valley Road passes through the parcel on the eastern side, and other ranch roads, not accessible for this survey, cross the parcel from east to west. The parcel contains Green Spring, and a ranch headquarters with a number of buildings and corrals. The spring itself is not as evident as the very extensive meadows surrounding it, which extend for several hundred acres and extending well beyond this parcel. The elevation range for Parcel K-13 is only 150 feet, from 4,020 to 4,175 feet. The soils in the central meadow and wetland portion of the parcel are mapped as Kelval fine sandy loam, occasionally flooded; and in the lowest areas, Kernfork loam, saline-sodic, occasionally flooded. The surrounding uplands are mostly Inyo gravelly loamy coarse sand and other valley floor soils formed in alluvium from granitic origin.

Vegetation resources. The most spectacular vegetation feature in this parcel was the very large meadow surrounding Green Spring. Occupying nearly 100 acres within Parcel K-13, this wetland had seasonally ponded water and rushes in the lowest portion, then a mix of salt grass, alkali sacaton, and other seasonal wetland species. The perimeter contained southern checkerbloom (*Sidalcea sparsiflora*), California hesperochiron (*Hesperochiron californicum*), and a species of blue-eyed grass believed to be Nevada blue-eyed grass (*Sisyrhinchium* cf. *halophilum*). The spring itself contained desert riparian vegetation including Fremont cottonwood and willows. Also present in this area was a ranch headquarters, including a residence, some outbuildings, and corrals, all mapped as developed. Surrounding the wetland was a large area of rubber rabbitbrush scrub; slightly upslope was Joshua tree/rubber rabbitbrush woodland. Also within this parcel was

a large area of annual grassland, evidently the result of a recent wildfire. On the western slope of Kelso Valley, this parcel also included a small area of California juniper woodland. A small pond was present near the developed ranch headquarters.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Meadow and spring, desert riparian and pond are all locally unique or considered sensitive statewide.

Three special-status plants were either observed or reported from Parcel K-13. CNDDB Occurrence 35 for alkali mariposa-lily is at Green Spring; although checked several times this spring, we did not locate any flowering individuals, but suitable habitat was very extensive. Death Valley sandmat was found in open fine sand in uplands around the eastern periphery of the marshes, and it is expected that more colonies could be present elsewhere in the parcel. Mojave paintbrush was observed under rubber rabbitbrush along the eastern edge of the marsh and also is likely to be present elsewhere in the parcel as well.

A number of special-status plants could also occur in lower-elevation gravelly and sandy flats in this parcel, such as white pygmy-poppy, Kern County evening-primrose and crowned muilla. Kelso Creek monkeyflower has been reported nearby and would be expected in the small streamlets in the uplands.

Disturbance factors. This parcel has a moderate level of disturbance from cattle ranching, including buildings, corrals, ranch roads, and other development features. Wildfire is also a factor, as evidenced by the recent fire and resulting loss of shrubland. No evidence of OHV use was noted.

Parcel K-14 (APN 153-090-05)

This 640-acre parcel is located on the southeastern part of Kelso Valley about a quarter-mile east of Kelso Valley Road and two miles north of Jawbone Canyon Road. No designated roads pass through this parcel. It is situated on a lower bajada dissected by many small ephemeral watercourses. These coalesce into some large and well-defined watercourses at the lower, southwestern portion of the parcel. The elevation range for this parcel is 570 feet, from 4,230 to 4,900 feet. Most of the soils in Parcel K-14 are mapped as Chollawell gravelly loamy coarse sand formed on fan remnants.

Vegetation resources. Most of this alluvial slope was vegetated with Joshua tree/blackbrush woodland; some areas were blackbrush scrub only. The two primary wash systems supported Joshua tree/goldenbush woodland on the higher reaches, while the lower reach supported Joshua tree/rubber rabbitbrush woodland.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Several special-status plants could occur in this parcel. CNDDB Occurrence 12 for Kelso Creek monkeyflower is located within Parcel K-14. The lower-elevation gravelly and sandy flats could contain habitat for white pygmy-poppy, Kern County evening-primrose, Tracy's eriastrum, crowned muilla, and Death Valley sandmat.

Disturbance factors. The USGS Pinyon Mountain quadrangle shows two tracks passing through the parcel. Several other lightly used tracks were evident on aerial photographs; this parcel appeared to have a light level of disturbance. No invasive weed infestations were noted during field surveys.

Parcel K-15 (APN 153-051-03)

This 634-acre parcel is located on the slope of Piute Mountain west of southern Kelso Valley. Geringer Grade, a steep portion of Jawbone Canyon Road, passes through the southwestern corner of the parcel; this is the only road access to the parcel. The Pacific Crest Trail passes less than a quarter-mile west of Parcel 15. Cottonwood Creek, a perennial stream that eventually empties into Jawbone Canyon several miles to the southeast, runs through the center of the parcel. The parcel slopes steeply to the south and east. The elevation range for this parcel is 1,600 feet, from 4,880 to 6,480 feet. The soils in this parcel are in the Sorrell-Martee-Rock Outcrop group; these are soils formed in residuum weathered from granitoid rocks.

Vegetation resources. Most of this parcel was mapped as interior live oak woodland. Some of the more sheltered north-facing slopes were mapped as Jeffrey pine forest, and a few areas were mapped as annual grassland. However, the mapping unit near Geringer Grade was high in species diversity and native species richness. It appeared to be an area of naturally thin soil supporting an herbaceous-dominated grassland rather than the result of wildfire, as was the case for many other parcels in Kelso Valley. Typical species in this area included blue field gilia, Arizona popcorn flower, California poppy, coreopsis, and variable linanthus. Unfortunately, time did not allow the Cottonwood Creek drainage to be investigated to determine its characteristics.

Special-status plant resources. This parcel could not be surveyed in detail for special-status plants, but the elevation range and variety of aspects provided in this rugged terrain suggest the possible occurrence of a number of species. The rock outcrops and talus slopes could provide habitat for Spanish Needle onion. Moist meadows along watercourses could support Palmer's mariposa-lily and Transverse Range phacelia. Rock outcrops could support unexpected larkspur and limestone dudleya, while shaded slopes could support pine fritillary. Open, gravelly areas could provide habitat for Tracy's eriastrum and Kern County evening-primrose. The lower, chaparral and woodland could contain habitat for Tehachapi monardella and fragile pentachaeta.

Disturbance factors. Human disturbance appeared to be limited on this parcel, due to the steep terrain and limited accessibility.

Parcel K-16 (APN 153-120-02)

This 640-acre parcel is located pm the steep slopes on the west side of the southern end of Kelso Valley, about a mile west of Jawbone Canyon Road as it passes through the valley. This parcel is west-facing, with several deep canyons. A spring known as Quail Spring is located near the lower, eastern edge of the parcel. The elevation range for Parcel K-16 is over 1,000 feet, from 4,200 to 5,280 feet. The soils in the steep uplands in this parcel are mostly in the Sorrell-Martee-Rock Outcrop and Kernville-Faycreek-Rock Outcrop groups; these are soils formed in residuum weathered from granitoid rocks.

Vegetation resources. Most of this steep and rugged parcel was mapped as singleleaf pinyon pine woodland, especially where fire has not recently cleared the woody vegetation. On a north-facing slope, California juniper dominated; this appeared to be situated in an area that may have burned in recent years. The lowest area on the south side of Parcel K-16 was mapped as annual grassland; this appeared to be a recently-burned area. On the steep, exposed slope above the grassland, California buckwheat occupied the most exposed areas, but this was a very diverse area with many woody species showing recovery from the fire; California fremontia (*Fremontodendron californicum*), penstemon, wedge leaf ceanothus, and chaparral yucca were present. Gray pine, interior live oak and a mix of these species were mapped in the more sheltered

areas, some of which may have burned. A small area of rocky outcropping was mapped along the watercourse in the center of the parcel.

Special-status plant resources. The tremendous elevation range and variety of aspects provided in this rugged terrain suggest the possible occurrence of a number of species. Death Valley sandmat was observed in the lower slopes of this varied parcel. The rock outcrops and talus slopes could provide habitat for Spanish Needle onion at the higher elevations and possibly limestone dudleya at the lower elevations. Moist meadows, seeps and springs along watercourses could support Palmer's mariposa-lily, Mojave tarplant and Transverse Range phacelia. Shaded slopes could support pine fritillary. Open, gravelly areas could provide habitat for white pygmy-poppy, Tracy's eriastrum, Kelso Creek monkeyflower, Kern Canyon clarkia and Kern County evening-primrose. The lower, chaparral and woodland could contain habitat for Tehachapi monardella and fragile pentachaeta. Moist edges of meadows could support Mojave paintbrush.

Disturbance factors. This parcel is essentially roadless, and little indication of vehicle access was evident on the project airphotos. Wildfire is a notable disturbance factor on the western side of Kelso Valley. However, livestock grazing was noted as a disturbance factor in the burned area in the southeastern corner of the parcel.

Parcel K-17 (APN 153-120-04)

This 120-acre parcel is located just to the south of Parcel K-13 on the floor of Kelso Valley. It contains more of the extensive wetlands arising from Green Springs and environs. This parcel is nearly level, extending across the valley floor from Kelso Valley Road. The elevation range for Parcel K-17 is only 90 feet, from 4,000 to 4,090 feet. The soils in the low-lying central meadow and wetland are mapped as Kernfork loam, saline-sodic, occasionally flooded. The surrounding uplands are mostly Chollawell and Inyo gravelly loamy coarse sand, valley floor soils formed in alluvium from granitic origin.

Vegetation resources. The most prominent vegetation feature in this parcel was the very large rush-dominated meadow that occupied nearly half of Parcel K-17. Surrounding the meadow was rubber rabbitbrush scrub, except for a large area of annual grassland dominated by cheatgrass. This appeared to be the location of a recent wildfire.

Special-status plant resources. Death Valley sandmat was found in open fine sand in uplands around the southern periphery of the marshes, and it is expected that more colonies could be present elsewhere in the parcel. Alkali mariposa-lily and Mojave paintbrush are reported from marsh habitat and marsh edges on the adjacent Parcel K-13 and could occur in Parcel K-17 as well. Gravelly and sandy flats in this parcel could support species such as white pygmy-poppy, Kern County evening-primrose and crowned muilla. Kelso Creek monkeyflower has been reported nearby and could be found in small streamlets in the uplands.

Disturbance factors. Wildfire is a significant disturbance factor in the shrublands, periodically removing the shrub cover and replacing it with annual grassland. Many native shrubs are sensitive to fire, and may not recover if subjected to repeated, frequent fires. The hydrology of this area has doubtless been affected by the adjacent landing strip, construction and maintenance of nearby Kelso Valley Road and the ranch road running east-west through this parcel. Although wildfire and hydrology disturbance are substantial, disturbance from OHV usage was not noted.

Parcel K-18 (APN 153-110-01)

This 632-acre parcel is located in the southern portion of Kelso Valley, mostly north and east of the intersection of Jawbone Canyon Road and Kelso Valley Road. The parcel consists of a gently

sloping, southwest-facing dissected bajada. A meadow or drainage flowing southward is noted along the western edge of the parcel. The elevation range for Parcel K-18 is 260 feet, from 3,950 to 4,210 feet. The soils in this parcel are mostly Chollawell and Inyo gravelly sandy soils formed on fan remnants and alluvium formed from granitic rocks.

Vegetation resources. This parcel supported several unusual or unique mapping units. As with most of Kelso Valley, the lower portion of the valley supported rubber rabbitbrush scrub, and Joshua tree/rabbitbrush woodland, while much of the uplands supported blackbrush scrub and Joshua tree/blackbrush woodland. However, this parcel was distinctive in that its north-facing slopes supported extensive areas of California juniper/blackbrush woodland and Joshua tree/Nevada ephedra woodland, which were not mapped elsewhere in the survey area. These seem to be more cold-tolerant vegetation types. The large drainage on the northern portion of Parcel K-18 supported a stand of cheesebush scrub, a vegetation type more common in the eastern acquisition area.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Several special-status plants could occur in this parcel. The lower-elevation gravelly and sandy flats could contain habitat for white pygmy-poppy, Kern County evening-primrose, Tracy's eriastrum, crowned muilla, intermontane lupine, Kelso Creek monkeyflower, fragile pentachaeta and Death Valley sandmat.

Disturbance factors. Identified roads have been mapped on all sides of this parcel, including Jawbone Canyon Road, Kelso Valley Road, and tracks mapped on the USGS Pinyon Mountain quadrangle. The level of disturbance was high around the periphery and low in the center of the parcel, where no obvious human disturbance or tracks were noted.

Parcel K-19 (APN 153-110-03)

This 634-acre parcel is located just west of Butterbredt Peak on the gently sloping slopes above Kelso Valley. Jawbone Canyon Road passes through the parcel, and several ephemeral watercourses drain to the west toward Kelso Valley. The elevation range for Parcel K-19 is 200 feet, from 4,000 to 4,200 feet. The soils here are Wingap-Pinyonpeak in the uplands, Chollawell gravelly sands on the upper bajadas, and Hoffman-Tips-Pilotwell association soils formed on middle and lower slopes; all are formed in granite parent material or alluvium formed from granitoid rocks. The southern portion of the parcel was mapped as having non-marine sedimentary substrate, perhaps formed from eroding granitic formations.

Vegetation resources. As in Parcel K-18, California juniper provided a substantial contribution to vegetation cover in this parcel. The north-facing slopes to the south of Jawbone Canyon Road supported primarily California juniper/blackbrush woodland, while the upper slopes farther north supported California juniper-Joshua tree/blackbrush woodland, and the most rocky areas supported California juniper/California buckwheat woodland. The lower slopes supported Joshua tree/blackbrush woodland. Most of the desert wash scrub supported typical species such as cheesebush and goldenbush, but the lower reaches of the wash were much more diverse, and were mapped as upper Mojave mixed woody scrub.

Special-status plant resources. Although widespread and abundant in the survey area, Joshua tree woodland is state-ranked S3, meaning it is a sensitive natural community. Several special-status plants could occur in this parcel. The gravelly and sandy flats could contain habitat for white pygmy-poppy, Kern County evening-primrose, Tracy's eriastrum, Kelso Creek monkeyflower,

crowned muilla, and Death Valley sandmat. The edges of juniper stands could contain fragile pentachaeta, and the rocky outcrops could support limestone dudleya.

Disturbance factors. Apart from the presence of Jawbone Canyon Road, which passes through this parcel, both historic and recent OHV tracks seemed limited or absent. As noted elsewhere, the eastern side of Kelso Valley experiences less wildfire than the western side.

Parcel K-20 (APN 153-120-07)

This 513-acre parcel is located at the southern end of Kelso Valley, in the low, marshy area south of the intersection of Jawbone Canyon Road and Kelso Valley Road. This parcel contains a feature labeled "Schoolhouse Well" on the USGS Cross Mountain quadrangle. The parcel is low, gently sloping to the south, and has an elevation range of 230 feet, from 3,870 to 4,100 feet. This parcel contains some of the lowest-lying land in Kelso Valley, and the soils in the low-lying wetland are mapped as Kernfork loam, saline-sodic, occasionally flooded. The surrounding uplands are mostly Chollawell gravelly loamy coarse sand, valley floor soils formed in alluvium from granitic origin.

Vegetation resources. Parcel K-20 was perhaps one of the most interesting parcels in Kelso Valley. It contained a very extensive area of meadow and seep in the eastern portion, but it was more alkaline in general than the meadows farther north, supporting mainly rushes as well as California hesperochiron, yerba mansa, salt grass, alkali sacaton and even western nitrophila (*Nitrophila occidentalis*). Much of the parcel also supported annual grassland, evidently the result of recent wildfire. The habitat immediately adjoining the meadow was rubber rabbitbrush scrub, while further upland is California juniper/rubber rabbitbrush woodland. The slopes on the southern tip of Parcel K-20 contained the only example of blue oak woodland found in the Kelso Valley parcels. This was an open woodland with a few gray pine and a variety of understory perennials, such as shrubby ragwort, wedge leaf ceanothus, and Sandberg bluegrass. An extensive desert wash was mapped on the western side of the parcel; this contained a beautiful stand of California evening-primrose.

Special-status plant resources. Death Valley sandmat was found in open fine sand in uplands around the periphery of the marshes, and it is expected that more colonies could be present elsewhere in the parcel. The marsh and peripheral habitat could support alkali mariposa-lily and Mojave paintbrush. Less likely, but possible in a high rainfall year in alkaline clay soil in the margins of the marshes is pale yellow layia. Gravelly and sandy flats could support species such as white pygmy-poppy, Kern County evening-primrose, Tracy's eriastrum, and crowned muilla. Kelso Creek monkeyflower has been reported nearby and would be expected in the small streamlets in the uplands. Fragile pentachaeta could occur in the uplands near the junipers.

Disturbance factors. Jawbone Canyon Road bisects the parcel from north to south, and a ranch road provides access to Schoolhouse Well. The roads almost certainly interfere with the natural hydrology of the meadows, and grading associated with the landing strip to the north may have altered the hydrology as well. Wildfire plays a role in the ecology of this part of Kelso Valley, as evidenced by the large area of annual grassland on the parcel. Groundwater pumping, whether for ranching, domestic use, and possibly for wind energy development, could also affect the natural hydrology of this site.

3.3.7 Landers Meadow Parcels

As the name suggests, the Landers Meadow parcels are located in a mountain meadow on the eastern side of the crest of Piute Mountain.

Parcel L-1 (APN 153-012-03)

This 123-acre parcel is situated at the western end of Landers Meadow on the eastern side of Piute Mountain, about a mile from the camp of Claraville. Piute Mountain Road passes through this parcel, and the Pacific Crest Trail skirts around the northern and western edges of the parcel. The parcel slopes very gently to the west, emptying into Landers Creek a short distance farther west; Landers Creek is a tributary of Kelso Creek, in the South Fork Kern River watershed. The elevation range for Parcel L-1 is 170 feet, from 6,210 to 6,380 feet. The soils include the Wind River-Dome Rock group of soils formed in residuum from metamorphic, metasedimentary or granitic rock; Monache soils, marshy soils formed in alluvium from granite; and a small amount of Scodie, Sacatar-Canebrake complex soils formed in residuum weathered from granitoid rocks. Since Smith (1964) shows the parent material in and around Landers Meadow as granitic, any metamorphic influences on the soils are probably limited.

Vegetation resources. A meadow extended the entire length of Parcel L-1; this was mainly dominated by rushes, but transitioned into big sage scrub forming dry meadows in the adjacent uplands. These contained big sage with rubber rabbitbrush, beardless wildrye (*Elymus triticoides*), desert needlegrass, and prickly poppy. The gently sloping uplands to the north and south of the meadow supported open Jeffrey pine forest. Big sage, greenleaf manzanita, and sticky-leafed rabbitbrush were present in the forest understory, along with pine bluegrass, lupine, and leafy daisy (*Erigeron* sp.). A very small pond was situated near the southern border of Parcel L-1; it supported veronica and spikerush.

Special-status plant resources. The marsh and pond habitats are considered sensitive because they are limited statewide. Two special-status plants are reported from the marshes and dry meadows at Landers Meadow and are assumed to be present in both parcels L-1 and L-2: Palmer's mariposa-lily (CNDDB Occ. 10) and Mojave paintbrush (CCH, 2012). A number of other species could occur here: Kern Canyon clarkia on dry slopes; Breedlove's buckwheat in Jeffrey pine forest; fragile pentachaeta in grassy openings in conifer forest; Transverse Range phacelia in sandy or rocky slopes, flats and meadows; and San Bernardino aster in the marshes of Landers Meadow.

Disturbance factors. As indicated in preceding paragraphs, Piute Mountain Road passes through Parcel L-1. No other roads are indicated on the USGS Claraville quadrangle, but airphotos indicate at least one unimproved road provides access to Landers Meadow from the paved road. No indication of off-road vehicle activity was noted during field surveys.

Parcel L-2 (APN 153-012-05)

This 41-acre parcel is located in the central portion of Landers Meadow, immediately to the east of Parcel L-1. This parcel is a very short distance south of Piute Mountain Road. As with Parcel L-1, this parcel slopes very gently to the west, eventually draining into Landers Creek, a tributary of Kelso Creek, in the South Fork Kern River watershed. The elevation range for this nearly level parcel is only 30 feet, from 6,320 to 6,350 feet. The soils here are Deerspring fine sandy loams and Monache variant soils in the lowlands and Scodie-Sacatar-Canebrake complex on the uplands.

Vegetation resources. The meadow was vegetated with rush-dominated meadow and seep vegetation, with periodically saturated adjacent sites dominated by big sagebrush. The uplands supported open Jeffrey pine forest.

Special-status plant resources. The marsh habitat is considered sensitive because it is limited statewide. Two special-status plants are reported from the marshes and dry meadows at Landers Meadow and are assumed to be present in both parcels L-1 and L-2: Palmer's mariposa-lily (CNDDB Occ. 10) and Mojave paintbrush (CCH, 2012). A number of other species could occur here: Kern Canyon clarkia on dry slopes; Breedlove's buckwheat in Jeffrey pine forest; fragile pentachaeta in grassy openings in conifer forest; Transverse Range phacelia in sandy or rocky slopes, flats and meadows; Shevock's bristle moss in shaded rocky underhangs in granite rock; and San Bernardino aster in the marshes of Landers Meadow.

Disturbance factors. No roads are indicated on either USGS Claraville quadrangle or on airphotos for Parcel L-2. No indication of off-road vehicle activity was noted during field surveys.

Parcel L-3 (APN 153-012-07)

This 81-acre parcel is located just to the southeast of Parcel L-2 and is situated on the north-facing uplands to the south of Landers Meadow. It is located about a quarter-mile south of Piute Mountain Road. Some minor and probably ephemeral watercourses drain from Parcel L-3 toward Landers Meadow, which drains into Landers Creek, a tributary of Kelso Creek, in the South Fork Kern River watershed. The elevation range for this parcel is 440 feet, from 6,400 feet near Landers Meadow to 6,840 feet on the upper slopes. The soils are mapped as Scodie-Sacatar-Canebrake association, and the Sorrell-Martee-Rock Outcrop association, both formed in residuum from weathered granitoid rocks.

Vegetation resources. All of this parcel was mapped as open Jeffrey pine forest. Associated species included singleleaf pinyon pine, canyon live oak, and Oregon oak. The understory contained patchy areas of shrubs, including big sage, wedge leaf ceanothus, Bridge's penstemon (*Penstemon rostriflorus*), and sulfur buckwheat (*Eriogonum umbellatum*). Boulder outcrops added to the habitat diversity of this parcel.

Special-status plant resources. Several special-status species could occur here: Kern Canyon clarkia on dry slopes; Breedlove's buckwheat in Jeffrey pine forest; fragile pentachaeta in grassy openings in conifer forest; Transverse Range phacelia in sandy or rocky slopes, flats and meadows; Shevock's bristle moss in shaded rocky underhangs in granite rock; pine fritillary on shaded granitic slopes; and Spanish Needle onion, limestone dudleya and unexpected larkspur on rock outcrops.

Disturbance factors. A road is shown on the USGS Claraville quadrangle just north of the northern edge of Parcel L-3, and there may be some traces of roads through the forest within the parcel. There were no designated roads or tracks, and the airphotos indicated little if any off-road activity.

3.3.8 Caliente Creek Parcels

The Caliente Creek parcels are situated on the western slope of Piute Mountain, in the Caliente Creek watershed. These parcels were not visited during the 2012 surveys, and information on soils and vegetation is taken from CALVEG (US Forest Service, 2012).

Parcel C-1 (APN 442-020-20)

This 640-acre parcel is situated in Hugh Mann Canyon. The watercourse passing through the center of the parcel is unnamed on USGS geologic maps, but is a tributary of Weaver Creek, a tributary of Caliente Creek. The USGS Emerald Mountain quadrangle indicates the presence of one spring on the parcel; additional, smaller springs may be present as well. The elevation range for the parcel is 1,250 feet, from 3,480 feet at the bottom of the canyon to 4,730 at the ridgeline

on the northern edge of the parcel. The soils on Parcel C-1 are primarily Tunis-Tollhouse-Sorrell Association, soils of steep mountain slopes formed in residuum from weathered gneiss and/or granitoid rocks. Since the geologic map (Smith, 1964) indicates the presence of extensive metamorphic formations in this area, the soils are likely to be formed from gneiss in this area.

Vegetation resources. Much of the lower, south-facing slopes of Hugh Mann Canyon are mapped as California juniper woodland, while the upper slopes support California buckwheat shrubland. Near the ridgeline are some smaller areas of gray pine woodland and big sage scrub. Openings in the shrubland and woodland support annual grassland. In the deepest, north-facing portion of the canyon is blue oak woodland; elsewhere on the north-facing slope are annual grassland, California buckwheat scrub, gray pine woodland and big sage scrub (US Forest Service, 2012).

Special-status plant resources. A number of special-status plants could occur within this parcel. Meadows and seeps could support California androsace and streambank spring beauty; open areas of shale or loose alluvium could support Tracy's eriastrum; gabbro or granodiorite soils could support Piute cypress; bare, sunny, shrubby areas could support calico monkeyflower; sandy or gravelly soils could contain habitat for slender threadplant; red clay soils or gravelly loam in woodland or grassland could support Piute Mountains navarretia; openings in woodland and chaparral could support fragile pentachaeta and aromatic canyon gooseberry.

Disturbance factors. The USGS Emerald Mountain quadrangle shows a four-wheel drive road traversing the south-facing slope up the canyon, passing from the northwest portion of the parcel across the canyon, the rising up the steep north-facing slope to the ridge on the south side of the parcel. A second light-duty road more or less follows the drainage eastward through the parcel. Airphotos indicate more well-defined roads at the top of the ridge on the south side of the parcel.

Parcel C-2 (APN 442-010-10)

This 160-acre parcel is located on the south side Hugh Mann Canyon, which contains an unnamed watercourse that is tributary to Weaver Creek, itself a tributary of Caliente Creek. The parcel is perched on a steep north-facing slope with an elevation range of 620 feet, from 4,000 feet at the streambed to 4,620 feet at the ridge. No watercourses or springs are indicated on the parcel, although small seeps and springs may be present. The soils on Parcel C-2 are Tunis-Tollhouse-Sorrell Association, soils of steep mountain slopes formed in residuum from weathered gneiss and/or granitoid rocks. The geologic map for this region (Smith, 1964) indicates the presence of extensive metamorphic formations in this area, so the soils are likely to be formed from gneiss parent material.

Vegetation resources. Vegetation is mapped as blue oak woodland in the lower portion of the canyon. One area of gray pine is indicated on the mid-slopes, and the remaining mid- to upper portions of the slopes support big sage scrub, with annual grassland in openings (US Forest Service, 2012).

Special-status plant resources. A number of special-status plants could occur within this parcel. Meadows and seeps could support California androsace and streambank spring beauty; open areas of shale or loose alluvium could support Tracy's eriastrum; gabbro or granodiorite soils could support Piute cypress; bare, sunny, shrubby areas could support calico monkeyflower; sandy or gravelly soils could contain habitat for slender threadplant; red clay soils or gravelly loam in woodland or grassland could support Piute Mountains navarretia; openings in woodland and chaparral could support fragile pentachaeta.

Disturbance factors. A four-wheel drive road passes from the adjacent Parcel C-1 through the northwestern corner of Parcel C-2, then descends to the canyon bottom. Just to the north of the parcel, the topographic map shows several old structures near the creek floodplain. The dense brushy vegetation and steep slopes make it unlikely that this area would have much ongoing human disturbance.

Parcel C-4 (APN 442-030-01)

This 640-acre parcel is situated on the upper slopes of Back Canyon and includes the ridge separating this canyon from Hugh Mann Canyon. The elevation range for the parcel is 1,400 feet, from 3,600 feet in the lower draws of Back Canyon to 5,000 feet on the highest portion of the ridgeline on the northern portion of the parcel. Most of the parcel has south- and west-facing steep slopes. Although some watercourses are shown on the USGS map, the high, exposed position on the ridge suggests that these are ephemeral streams. The soils in Parcel C-4 are Locobill-Backcanyon-Sesame complex (steep mountainous slopes with soils formed from weathered granitoid and metamorphic rocks) and Tunis-Tollhouse-Sorrell association (mountain slopes with soils formed from weathered gneiss or from granitoid rocks. As with Parcel C-1, the geologic map indicates the presence of extensive igneous-derived metamorphic parent material in this area.

Vegetation resources. About half of the parcel and most of the south- and west-facing slopes support extensive areas of California juniper woodland. Some areas near the ridgetop support blue oak woodland and annual grassland, with a few patches of California buckwheat scrub in the more rocky areas. The north-facing slopes at the top of the ridge support big sage scrub and a dense stand of gray pine and interior live oak woodland. More sheltered north-facing slopes farther downslope nearer Back Canyon support dense singleleaf pinyon pine woodland (US Forest Service, 2012).

Special-status plant resources. A number of special-status plants could occur within this parcel. Meadows and seeps could support California androsace and streambank spring beauty; open areas of shale or loose alluvium could support Tracy's eriastrum; gabbro or granodiorite soils could support Piute cypress; bare, sunny, shrubby areas could support calico monkeyflower; sandy or gravelly soils could contain habitat for slender threadplant; red clay soils or gravelly loam in woodland or grassland could support Piute Mountains navarretia; and openings in woodland and chaparral could support fragile pentachaeta.

Disturbance factors. The USGS Emerald Mountain quadrangle indicates a single unimproved road running along the ridgeline near the northern edge of the parcel and then ending on a ridge in the center of the parcel. Several roads approach the parcel on the western side but do not enter the parcel.

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Appendix A. Special-status Species Considered as Potentially Occurring in the Eastern Kern County Acquisition Survey Area

Appendix A. Special-status Plant Species Considered as Potentially Occurring in the Eastern Kern County Acquisition Project Area.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Allium shevockii Spanish needle onion	--/--/S/1B.3	S. Sierra Nevada, Piute and Tehachapi mountains; Spanish Needle Peak, Emerald Mountain, Sand Canyon, Horse Canyon	Metamorphic outcrops, clay, gravel or talus; pinyon-juniper woodlands and upper montane coniferous forests; 2,800-8,200 feet	Perennial bulbiferous herb/ May – July	**Moderate**. Mapped at North Sky River Wind Farm (2010) and rock outcrops S of Jawbone Canyon. Metamorphic substrate possibly present at Landers Meadow, generally lacking elsewhere, but outliers could occur.
Amsinckia douglasiana Douglas' fiddleneck	--/--/--/4/2	Widely distributed in cismontane California, primarily in South Coast and Transverse Ranges; records from Oregon to Baja California	Dry, hard soil in valley and foothill grassland, oak woodland; usually on shale soils; 0-6,400 feet	Annual herb/March-May	**Unlikely to occur.** Nearest record is from Keene quadrangle, Caliente Road near Hwy. 58, Piute Mountains. Caliente Creek parcels are >15 miles out of known range and lack shale substrate.
Androsace elongata ssp. *acuta* California androsace	--/--/--/4.2	Ranges from Oregon to Baja California, mostly cismontane	Highly localized; clay soils in meadows and seeps; cismontane woodland, chaparral, valley and foothill grassland, coastal scrub, pinyon and juniper woodland, 500-4,000 feet	Annual herb/February-May	**High.** Nearby records from Woolstaff Creek, N of Tehachapi Pass, and Glennville suggest species could be present in Caliente Creek parcels; less likely in Kelso Valley parcels.
California macrophylla Round-leaved filaree	--/--/S/1B.1	Widely distributed in cismontane California from Lassen to San Diego counties	Clay flats in cismontane woodland, valley and foothill grassland; 50-4,000 feet	Annual herb/March-July	**Unlikely to occur.** Several records from N of Tehachapi and near Glennville, >15 miles from Caliente Creek parcels which may lack clay substrate.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Calochortus palmeri var. *palmeri* Palmer's mariposa-lily	--/--/S/1B.2	Tehachapi Mountain area, Inner Coast Ranges, Transverse Ranges, San Jacinto Mountains	Meadows, vernally moist places in yellow-pine forest, chaparral; 3,300-7,900 feet	Perennial bulbiferous herb/ May-July	**Present**. Reported from Landers Meadow and observed on one parcel in Kelso Valley; likely to occur on other parcels along western side of Kelso Valley.
Calochortus striatus Alkali mariposa-lily	--/--/S/1B.2	Central Valley, Sierra Nevada and deserts; from Delano south to Los Angeles and E to Red Rock Canyon	Alkaline meadows, moist creosote-bush scrub, chaparral, chenopod scrub; 200-5,300 feet	Perennial bulbiferous herb, April-June	**Present**. CNDDB records from Green Spring in Kelso Valley. Likely in alkaline seeps in Alphie Canyon, Butterbredt and Dove Spring areas; not observed in 2012.
Camissonia integrifolia Kern River evening-primrose	--/--/S/1B.3	Limited to Kern River Canyon, Kern County	Chaparral, open brushy slopes; sometimes reported from floodplain; 2,200-3,300 feet	Annual herb/May	**Unlikely to occur**. Appears to be restricted to Kern River watershed, several miles north of project area.
Camissonia kernensis ssp. *kernensis* Kern County evening-primrose	--/--/--/4.3	Southeast Sierra Nevada, western Mojave Desert (Piute, El Paso Mtns.; Grapevine Canyon, Kern County)	Sandy slopes, granitic flats, generally in sagebrush scrub or Joshua-tree woodland; 2,600–7,000 feet	Annual herb/ March-May	**High**. A CNDDB occurrence is near Parcel K-9 on Esperanza Creek. Suitable habitat in several parcels in Kelso Valley, Landers Meadow, Alphie Canyon, Butterbredt Canyon areas.
Canbya candida White pygmy-poppy	--/--/--/4.2	Southern California deserts from Inyo National Forest south to San Bernardino, southern Sierra Nevada, Tehachapi Mountain area	Joshua tree woodland, Mojavean desert scrub - sandy places; 1,900-4,900 feet	Annual herb/ April – May	**High**. Mapped at North Sky River Wind Farm; other records from Dove Spring Canyon, 9 mi. N of Ricardo. Suitable habitat present in many parcels in Kelso Valley, Butterbredt Canyon, Alphie Canyon, Jawbone and Sugarloaf areas.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Castilleja plagiotoma Mojave paintbrush	--/--/--/4.3	Southern Sierra Nevada, Tehachapi Mountain area, Inner South Coast Ranges, Transverse Ranges, Mojave Desert	Dry sagebrush scrub, pinyon woodland; 950-8,200 feet	Perennial herb (hemipara-sitic)/April - June	**Present**. Observed near Green Spring in Kelso Valley, reported from Landers Meadow; high potential to occur in moist, alluvial habitats elsewhere, especially in Kelso Valley.
Chamaesyce vallis-mortae Death Valley sandmat	--/--/--/4.2	East of the Sierra Nevada, Mojave Desert	Mojavean desert scrub; dry, sandy places; < 4,800 feet	Perennial herb/May - October	**Present**. Observed at many parcels in Kelso Valley, Butterbredt Canyon, reported from parcels in Sugarloaf area and likely to occur on many more parcels.
Chorizanthe spinosa Mojave spineflower	--/--/--/4.2	Western Mojave Desert; Kern, Fresno, Los Angeles and San Bernardino counties	Sand or gravel, also with clay; 50-4,800 feet	Annual herb/April - July	**Present.** Observed on Parcel S-6, suitable habitat present at several other parcels; reported from several more sites in general area.
Clarkia xantiana ssp. *parviflora* Kern Canyon clarkia	--/--/--/4.2	Southern Sierra Nevada (especially Kern River drainage); Kern, Tulare, Inyo, Los Angeles counties	Dry slopes, sandy or rocky substrate; chaparral, valley and foothill grassland, cismontane woodland, Great Basin scrub - 2,400-5,200 feet.	Annual herb/May-June	**Moderate**. Most records are north of project area in the Kern River drainage. Nearest record is on Piute Mountain Road 3.5 miles W of Kelso Valley Road, en route to Landers Meadow.
Claytonia lanceolata var. *peirsonii* Peirson's spring beauty	--/--/--/3.1	Most records from San Gabriel Mts., San Bernardino County; also from Eastern Tehachapi Mountains	Gravelly woodland, meadows in upper and subalpine coniferous forests; 4,900-9,000 feet	Perennial herb/May - July	**Unlikely to occur**. Most records are from San Bernardino County, with a single record from Jawbone Canyon near the summit of Cross Mountain. Suitable habitat limited in project area.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Claytonia parviflora ssp. *grandiflora* Streambank spring beauty	--/--/--/4.2	Sierra Nevada foothills, Tehachapi Mountain area; Butte to Kern counties	Vernally moist, rocky, often disturbed sites in cismontane woodlands; 500-4,800 feet	Annual herb/ May - July	**Moderate**. Herbarium record from Caliente Canyon suggests species may be present in Caliente Creek parcels; also reported from Aqueduct road near Water Canyon S of Jawbone Canyon.
Cymopterus deserticola Desert cymopterus	--/--/S/1B.2	Mojave Desert; Kern, Los Angeles and San Bernardino counties	Joshua tree woodland, Mojavean desert scrub; sandy soils; 2,000-5,000 feet	Perennial herb/March-May	**Present.** Observed in Parcel A-3, an extension of known range; low potential to occur elsewhere in project area.
Deinandra arida Red Rock tarplant	--/SR/S/1B.2	Western Mojave Desert (El Paso Mountains, eastern Kern County), primarily in Red Rock Canyon	Mojavean desert scrub, washes, canyon slopes, edges of springs, seeps; clay and volcanic tuff substrates; 1,000-3,300 feet	Annual herb/ April– November	**Moderate**. All known records are from Red Rock Canyon, several miles east of project area; suitable clay substrate may be present in some Eastern Acquisition area parcels.
Deinandra mohavensis Mojave tarplant	--/SE/S/1B.3	Southern Sierra Nevada, San Bernardino Mtns (extirpated), Peninsular Ranges, western edge of Mojave Desert	Moist sites, sand bars, grassy riparian habitats, openings in chaparral, desert scrub, woodland; 1,500-5,300 feet	Annual herb/May -January	**High**. Nearest record is a side canyon near Blue Point. Suitable habitat in project area, most likely in Butterbredt, Alphie Canyon areas.
Delphinium inopinum Unexpected larkspur	--/--/--/4.3	S. Sierra Nevada; Kings Canyon National Park, Inyo National Forest south to mountains east of Bakersfield	Rock outcrops, meta-morphic and limestone substrates; upper montane conifer forest, red fir forest and western white pine forest; 6,000-9,800 feet	Perennial herb/ May-August	**Moderate**. Closest known occurrence is near Piute Peak, 5 miles W of project area. Possibly suitable substrate could be found at Landers Meadow.

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Delphinium parryi ssp. *purpureum* Mount Pinos larkspur	--/--/--/4.3	Tehachapi Mountain area, outer South Coast Ranges, western Transverse Ranges	Often on white calcareous rock; dry chaparral; sage-brush scrub, Mojavean desert scrub, pinyon-juniper woodland, 3,300-8,500 feet	Perennial herb/April - June	**Unlikely to occur**. Mapped at nearby North Sky River Wind Farm in 2010 but project area somewhat out of range and calcareous substrate lacking.
Delphinium purpusii Rose-colored larkspur	--/--/S/1B.3	Kern, Tulare counties; most records are in Kern River Canyon	Chaparral, cismontane woodland, pinyon and juniper woodland; rocky areas with granite or carbonate substrate; 980-4,400 feet	Perennial herb/April-May	**Unlikely to occur**. Known records are all restricted to the Kern River Canyon to the north of the project area.
Dudleya abramsii ssp. *calcicola* Limestone dudleya	--/--/--/4.3	S. Sierra Nevada; Inyo, Kern and Tulare counties	Open, rocky, granite or limestone outcrops in chaparral or pinyon-juniper woodlands; 1,600-8,500 feet	Perennial herb/April-August	**High**. Several records within five miles of project parcels. Suitable habitat is present in rocky areas throughout project area.
Eriastrum brandegeeae Brandegee's eriastrum	--/--/--/1B.1	Inner North Coast ranges and southern Sierra Nevada; most authorities currently restrict species to North Coast Ranges	Open flats of volcanic soils, shales in chaparral and woodlands; 1300-3280 feet	Annual herb, April-August	**Unlikely to occur**. Although some recent records are 2.5 miles from project area, volcanic and shale substrate are absent in project area.
Eriastrum tracyi Tracy's eriastrum	--/CR/--/ 3.2	Klamath Ranges, Modoc Plateau, San Francisco Bay Area Inner North Coast Ranges, S Sierra Nevada	Open areas on shale or alluvium in chaparral or cismontane woodland; 1,300-3,300 feet	Annual herb/ May-August	**Moderate**. Mapped at nearby North Sky River Wind Farm in 2010. Shale habitat lacking but alluvium and apparently potential habitat is present in Kelso Valley and Caliente Creek parcels.

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Eriogonum breedlovei var. *breedlovei* Breedlove's buckwheat	--/--/--/1B.2	Piute Mountains, Kern County	Pinyon and juniper woodland, upper montane coniferous forest; carbonate, quartzite; 7,500-8,200 feet.	Perennial herb, June-September	**Moderate** in Landers Meadow parcels. Nearest records are 2-4 miles to NW at slightly higher elevations.
Eriogonum kennedyi var. *pinicola* Kern buckwheat	--/--/S/1B.1	Southeastern Sierra Nevada foothills (Sweet Ridge, south of Cache Peak, SE Kern County)	Gravel in chaparral and pinyon juniper woodlands; carbonate and basalt substrate; 5,500-5,900 feet	Perennial herb/May - June	**Unlikely to occur**. Mapped at North Sky River Wind Farm, 10 miles distant. Basalt and carbonate substrate lacking in project area.
Eschscholzia minutiflora ssp. *twisselmannii* Red Rock poppy	--/--/S/1B.2	Deserts E of Bakersfield to NE of Lancaster; most records in Rand and El Paso Mountains	Mojavean desert scrub, desert washes, flats slopes; usually on volcanic substrate; <8,500 feet	Annual herb/ March – May	**Moderate**. Many nearby records from Rand and El Paso Mtns. Volcanic soils not present in project area. Outliers could occur in eastern portion of project area in clay soils.
Eschscholzia procera Kernville poppy	--/--/--/3	Kern County; apparently limited to region of Kernville, Kern River Canyon	Sandy floodplains in cismontane woodland; 2,600-3,400 ft	Perennial herb/June-September	**Unlikely to occur**. Appears to be limited to the Kern River drainage. Nearest records are N of Lake Isabella, >15 miles NW of project area
Fritillaria pinetorum Pine fritillary	--/--/--/4.3	Central Sierra Nevada, Tehachapis, Transverse Ranges; Mono, Tuolumne, Inyo, to Los Angeles, San Bernardino cos.	Shaded metamorphic or granitic slopes in chaparral, coniferous forest, and pinyon-juniper woodlands; 5,900-10,500 feet	Perennial bulbiferous herb/ May-September	**Moderate**. Nearest occurrence is approximately 4.5 miles from western edge of project area. Suitable habitat in western Kelso Valley, Landers Meadow areas.
Hesperocyparis nevadensis Piute cypress	--/--/S/1B.2	S Sierra Nevada; Fresno, Kern and Tulare counties	Granodiorite, gabbro, limestone; pinyon/juniper or oak/pine woodland,	Perennial evergreen tree	**Moderate**. Nearest records are from Back Canyon, W side of Piute Mountains. Could be

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
			chaparral, closed-cone cypress forest; 2,400-5,900 feet		found in Caliente Creek parcels.
Heterotheca shevockii Shevock's golden-aster	--/--/S/1B.1	Lower Kern River Canyon, Greenhorn Mountains; Kern County	Sandy soils; chaparral, cismontane woodland; 700-3,000 ft	Perennial herb/August-November	**Unlikely to occur**. Nearest record is about 20 miles NW of project area at lower elevation.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	--/--/S/1B.1	Central Valley southward through coastal counties, Tehachapi Range and Mojave Desert; Baja California	Marshes and swamps, coastal salt marshes, playas, and vernal pools; 3-4,000 feet	Annual herb/ February-June	**Unlikely to occur**. Nearest record, possibly extirpated, is from Tehachapi. Suitable playa and vernal pool habitat unlikely in Caliente Creek parcels.
Layia heterotricha Pale yellow layia	--/--/S/1B.2	S Inner Coast Ranges to San Joaquin Valley edges; many extirpated records	Pinyon and juniper woodland, cismontane woodland, valley and foothill grassland; open areas in alkaline or clay soils; 900-5,600 feet	Annual herb/ March-June	**Moderate.** Nearest location is Sand Canyon; only potentially suitable habitat would be in Caliente Creek parcels.
Lupinus pusillus var. *intermontanus* Intermontane lupine	--/--/--/2.3	E of Sierra Nevada; Lassen, Inyo, Modoc and Mono counties to Washington, Montana, Arizona	Great basin scrub, open, sandy areas; 4,000-5,300 feet	Annual herb/ May - June	**Moderate**. Closest occurrence is one mile south of the project area and is dated 1956. Suitable habitat most likely in Kelso Valley parcels.
Mentzelia eremophila Solitary blazing star	--/--/PI/4.2	Western Mojave desert; Inyo, Kern, San Bernardino counties	Canyons, rocky slopes and washes, roadsides, creosote-bush scrub; 1,900-4,100 feet	Annual herb/ March - May	**High**. Many occurrences from Red Rock Canyon SP and environs. Suitable habitat present in Alphie Canyon, Butterbredt Canyon, Dove Spring and Kelso Valley areas.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Mentzelia tridentata Creamy blazing star	--/--/S/1B.3	S California deserts from east of the Inyo National Forest south to Imperial and San Diego counties	Creosote bush scrub; mud hills; 2,300-4,300 feet	Annual herb/ April-May	**High**. Closest known occurrence is one mile east of project area; suitable present habitat, esp. in Sugarloaf and Jawbone areas.
Mimulus pictus Calico monkeyflower	--/--/S/1B.2	Southern Central Valley and foothills of Sierras from Visalia to north of Lancaster	Bare, sunny, shrubby areas around granite outcrops in forests and woodlands; 300-4,300 feet	Annual herb, March-May	**Moderate**. Nearest known occurrences to Caliente Creek parcels are at Keene Station and grade to Walker Basin.
Mimulus shevockii Kelso Creek monkeyflower	--/--/S/1B.2	S Sierra Nevada foothills (Cortez and Cyrus Canyons), W edge of Mojave Desert (Kelso Creek) Kern County	Alluvial fans, dry streamlets, generally on granitic soils; 2,900-4,300 feet	Annual herb/March – May	**Present**. Records show this species is present in the project area within Kelso Valley and suitable habitat is present on many parcels there.
Monardella linoides ssp. *oblonga* Tehachapi monardella	--/--/S/1B.3	Tehachapi Mountain area, northwestern Transverse Ranges; mostly on W side of Sierra Nevada	Chaparral, conifer woodland to forest, gravelly, dry slopes, flats; 4,900-8,500 feet	Perennial rhizomatus herb/ June - August	**Moderate**. Mapped at nearby North Sky River Wind Farm in 2010. Project area is slightly out of range but suitable habitat may be present in western Kelso Valley and Landers Meadow.
Muilla coronata Crowned muilla	--/--/--/4.2	East side S Sierra Nevada, Mojave Desert, expected in Tehachapi Mountains; W Nevada	Open Mojave desert scrub, Joshua tree woodland, pinyon-juniper woodland; 3200-5300 feet	Perennial bulbiferous herb/ March-May	**High**. Suitable habitat in project area; known occurrences are recorded to the north, east and south.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Navarretia setiloba Piute Mountains navarretia	--/--/S/1B.1	West side of Piute Mountains, Kern and Tulare counties	Red clay soils, clay soils, gravelly loam; cismontane woodland, pinyon juniper woodland, valley and foothill grassland; 1,000-3,700 feet	Annual herb/April-July	**Low to Moderate.** Nearest record is from Caliente Road near Walker Basin about 12 miles from Caliente Creek parcels; suitable habitat may be present.
Nemacladus gracilis Slender threadplant	--/--/--/4.3	S San Joaquin Valley and Sierra Nevada foothills to Los Angeles County	Sandy or gravelly soils; cismontane woodland, valley and foothill grassland; 400-6,300 feet	Annual herb/March-May	**High.** Known occurrences from Caliente and foothills of Tehachapi Mountains; most likely in Caliente Creek parcels.
Orthotrichium shevockii Shevock's bristle moss	--/--/S/1B.3	Piute Mountains, southern Sierra Nevada; Kern and Tulare counties	Underhangs of granitic rock; lower montane coniferous forest, Joshua tree woodland, pinyon and juniper woodland; 2,500-7,000 feet	Moss	**Moderate.** Only reported records are from Scodie Mountains to the north. Suitable habitat may be present in Landers Meadow parcels.
Pentachaeta fragilis Fragile pentachaeta	--/--/--/4.3	S Sierra Nevada, San Joaquin Valley, southern South Coast Ranges, western Transverse Ranges	Grassy areas, chaparral, arid woodland, conifer forest; 160-6,900 feet	Annual herb/ March – June	**High.** Reported in S Kelso Valley. Suitable habitat may be present in Landers Meadow and several Kelso Valley parcels.
Perideridia pringlei Adobe yampah	--/--/--/4.3	Tehachapi Mountain area, South Coast Ranges, Western Transverse Ranges	Grassy slopes, red clay, calcareous and serpentine outcrops in coastal scrub, chaparral, cismontane woodland, pinyon and juniper woodland; 980-5,900 feet	Perennial herb, April -June	**Unlikely to occur**. Mapped at North Sky River Wind Farm, Caliente, and Keene Ranch, but no serpentine or calcareous substrate known from project area.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Phacelia exilis Transverse Range phacelia	--/--/--/4.3	S Sierra Nevada, western Transverse Ranges, San Gabriel and San Bernardino Mountains	Sandy or rocky slopes, flats, and meadows in montane coniferous forests and pebble plains; 3,600-8,900 ft.	Annual herb/May-August	**High**. An occurrence record is about 1 mile from Landers Meadow; suitable habitat is present in this area and possibly in western Kelso Valley parcels.
Phacelia hubbyi Hubby's phacelia	--/--/--/4.2	N South Coast, Santa Cruz Island, W Transverse Ranges; east of Bakersfield	Gravelly or rocky slopes, chaparral, grassland; < 3,300 feet	Annual herb/April – July	**Unlikely to occur**. Although reported in 1975 from Water Canyon, all other records are >40 miles distant. Record may be a misidentification of a more common species.
Phacelia nashiana Charlotte's phacelia	--/--/S/1B.2	S Sierra Nevada, eastern Tehachapi Mountains and the western edge of the Mojave Desert.	Sandy to rocky, granitic east-facing slopes, generally Joshua tree or pinyon/juniper woodland; 2,000- 7,900 feet	Annual herb, March – June	**Present.** Observed on one parcel in 2012; known localities on other parcels; suitable habitat extensive in eastern portion of project area.
Ribes menziesii var. *ixoderme* Aromatic canyon gooseberry	--/--/S/1B.2	S Sierra Nevada; Fresno, Kern, Tulare counties	In forest openings; chaparral, cismontane woodland; 2,000-3,800 feet	Shrub/April	**Moderate.** Nearest known locality is in Caliente Canyon, on Loraine quadrangle; suitable habitat likely present on Caliente Creek parcels.
Sclerocactus polyancistrus Mojave fish hook cactus	--/--/--/4.2	Mojave Desert from Inyo to San Bernardino counties; Nevada	Great Basin scrub, Joshua tree woodland, Mojavean desert scrub; usually on carbonate; 2,100-7,700 feet	Shrub (stem succulent)/April-July	**Present.** Observed on Parcel A-5; suitable habitat present in many parcels.
Streptanthus cordatus var. *piutensis*	--/--/S/1B.2	Southern high Sierra Nevada (Piute Mountains)	Roadbanks, cliffs on meta-morphic red clay soils; broadleafed upland forest, closed-cone coniferous	Perennial herb/June-July	**Moderate**. Mapped at nearby North Sky River Wind Farm in 2010; metamorphic substrate present in Caliente Creek area.

Scientific Name **Common Name**	**Status Fed/CA/ BLM/CRPR**	**Distribution**	**Habitat**	**Life form/ Flowering period**	**Potential to Occur in Project Area**
Piute Mountains jewel-flower			forest, pinyon-juniper woodland, open chaparral, Piute cypress stands; 3,900-5,600 feet		
Symphyotrichum defoliatum San Bernardino aster	--/--/S/1B.2	Primarily San Gabriel, San Bernardino Mountains, and Peninsular Ranges; Kern to San Luis Obispo, San Diego, Imperial counties	Vernally moist sites, often disturbed places; meadows, seeps, marshes and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, grassland; < 6,700 feet	Perennial rhizomatous herb/July–November	**Present**. Reported by Twisselmann (1967) from Landers Meadow

[a] Status explanations:

Federal:

-- = Not listed as endangered, threatened or candidate for listing

State:

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

California Rare Plant Rank (CRPR):

*=Known populations believed extirpated from that county.

1A= List 1A species: Presumed extinct in California.

1B= List 1B species: Rare, threatened, or endangered in California and elsewhere.

2=List 2 species: Rare, threatened, or endangered in California but more common elsewhere.

3=List 3 species: Plants about which more information is needed to determine their status.

4= List 4 species. Plants of limited distribution- a watch list.

Threat Code extensions and their meanings:

.1 - Seriously endangered in California

.2 – Fairly endangered in California

.3 – Not very endangered in California

Bureau of Land Management Rank (BLM, 2011):

S= Special status plant (Ridgecrest Resource Area or Bakersfield Resource Area)

[b] Potential Occurrence explanations:

Present: Species was observed during project surveys, or species records documented 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 5-mile radius of the project area. 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 5-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 5-mile radius of the project area. However, few components of suitable habitat are present within or adjacent to the project area.

Unlikely to occur: CNDDB or other documents do not record the occurrence of the species within or reasonably near the project area, and components of suitable habitat are lacking within or adjacent to the project area

Sources: Bureau of Land Management (2011), California Natural Diversity Database (2012), Consortium of California Herbaria (2012), CalFlora database (2012), California Native Plant Society (2012)

Appendix B. Plant Species Observed, by Parcel, Eastern Kern County Acquisition Project, Eastern Parcels

APPENDIX B. PLANT SPECIES OBSERVED, BY PARCEL, EASTERN KERN COUNTY ACQUISITION PROJECT, EASTERN PARCELS																																				
BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																		
AGAVACEAE		AGAVE FAMILY																																		
Hesperoyucca whipplei	*Yucca whippleyi*	Chaparral yucca	X		X		X					X									X				X										
Yucca brevifolia		Joshua tree						X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
AMARANTHACEAE		AMARANTH FAMILY																																		
Amaranthus sp.		Amaranthus													X						X															
APIACEAE		CARROT FAMILY																																		
Cymopterus deserticola		Desert cymopterus																		X																
Lomatium sp.		Lomatium					X																			X										
Lomatium mohavense		Mohave wild parsley										X	X		X	X	X	X	X	X	X	X				X	X	X	X		X				
ARACEAE		ARUM FAMILY																																		
Lemna minor		Smaller duckweed																																X		
ASTERACEAE		SUNFLOWER FAMILY																																		
Acamptopappus sphaerocephalus		Goldenhead		X									X		X	X							X											X	X
Acamptopappus sphaerocephalus var. *hirtellus*		Hairy goldenhead								X												X	X												
Ambrosia acanthicarpa		Annual bursage								X	X		X																						
Ambrosia dumosa		White bursage	X	X	X	X	X	X	X	X	X	X	X		X						X		X	X	X										
Ambrosia salsola var. *salsola*	*Hymenoclea salsola var. salsola*	Cheesebush	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X		X			X	X
Anisocoma acaulis		Scale bud			X									X	X																				X
Artemisia dracunculus		Tarragon																		X		X														
Artemisia tridentata		Big sage																X								X									
Baccharis salicifolia	*B. glutinosa*	Mule fat, seep willow	X		X										X						X	X												X	X
Baccharis sergiloides		Desert baccharis	X				X														X	X	X	X										X	X
Bebbia juncea	*Bebbia juncea v. aspera*	Sweetbush	X	X			X																												
Brickellia sp.		California brickellia	X																		X	X			X										
Brickellia californica		California brickellia					X																												
Brickellia desertorum		Desert brickellia	X									X			X						X	X	X	X	X										X
Brickellia microphylla		Little leaved brickellia	X		X																														
Calycoseris parryi		Yellow tackstem			X																					X									
Chaenactis sp.		Pincushion	X								X		X		X								X	X		X	X								
Chaenactis carphoclinia var. *carphoclinia*		Pebble pincushion				X	X			X			X																						
Chaenactis fremontii		Fremont pincushion	X		X																					X									
Chaenactis macrantha		Mojave pincushion																				X													
Chaenactis stevioides		Esteve pincushion	X																									X							X
Cirsium sp.		Thistle													X																				
Corethrogyne filaginifolia	*Lessingia filaginifolia*	Common sandaster																								X									
Encelia actoni		Acton's encelia	X	X	X	X	X		X	X		X		X	X				X	X	X	X	X	X	X		X	X			X			X	X
Ericameria cooperi var. *cooperi*		Cooper goldenbush	X								X	X			X	X	X	X	X	X	X	X	X	X				X	X		X				
Ericameria cuneata		Rock goldenbush	X		X										X	X			X			X	X	X	X	X					X			X	X

BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																	
Ericameria linearifolia		Interior goldenbush	X								X	X		X		X	X		X	X	X	X	X	X	X	X	X	X	X		X			X	X
Ericameria nauseosa	*Chrysothamnus nauseosus*	Rubber rabbitbrush			X			X	X	X	X		X	X	X			X		X	X	X	X		X		X	X	X		X			X	X
Ericameria paniculata	*Chrysothamnus paniculatum*	Blackstem rabbitbrush		X	X	X	X			X			X											X											
Ericameria teretifolia	*Chrysothamnus teretifolium*	Green rabbitbrush	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X			X	X
Eriophyllum sp.		Woolly sunflower																								X									
Eriophyllum ambiguum		Annual woolly sunflower	X	X	X		X	X		X		X			X					X		X	X	X	X	X		X						X	
Eriophyllum ambiguum var. *paleaceum*		Annual woolly sunflower																			X													X	
Eriophyllum pringlei		Pringle eriophyllum	X							X	X	X		X	X	X	X	X	X	X	X		X		X	X	X	X	X		X			X	
Eriophyllum wallacei		Wallace eriophyllum								X													X	X	X			X							
Gutierrezia microcephala		Sticky snakeweed	X				X					X	X								X	X	X	X	X										
Gutierrezia sarothrae		Matchweed					X																												
Lactuca serriola		Prickly lettuce													X																				
Lasthenia californica		Goldfields						X				X	X				X			X	X			X											
Layia glandulosa		White layia												X	X											X	X	X							
Lepidospartum squamatum		Scalebroom	X	X	X	X	X		X	X	X		X		X							X		X	X									X	
Leptosyne bigelovii	*Coreopsis bigelovii*	Coreopsis	X		X		X			X			X		X		X		X	X	X	X	X	X	X		X	X						X	X
Lessingia glandulifera var. *peirsonii*		Vinegar weed																								X		X							
Logfia depressa	*Filago depressa*	Dwarf cottonrose		X																															
Logfia filaginoides	*Filago californica*	California cottonrose	X																																
Malacothrix glabrata		Desert dandelion	X			X				X					X						X	X		X									X	X
Pseudognaphalium luteoalbum	*Gnaphalium luteoalbum*	White cudweed													X																				
Senecio flaccidus		Shrubby ragwort	X				X								X					X	X	X	X	X	X									X	X
Sonchus asper ssp. *asper*		Sow thistle													X																				
Stephanomeria exigua		Small wirelettuce										X										X				X	X	X			X				
Stephanomeria parryi		Parry rock pink														X					X														
Stephanomeria pauciflora		Wire lettuce	X	X	X		X			X	X	X	X		X					X	X	X	X	X	X					X			X	X
Stylocline sp.		Stylocline									X																								
Stylocline gnaphaloides		Everlasting stylocline											X																						
Syntrichopappus fremontii		Fremont's syntrichopappus												X		X	X			X	X			X				X	X						
Tetradymia axillaris var. axillaris		Catclaw horsebrush										X						X										X	X						
Tetradymia axillaris var. *longispina*		Catclaw horsebrush		X				X																	X									X	
Tetradymia glabrata		Little leaf horsebrush																				X													
Tetradymia stenolepis		Mojave horsebrush	X	X	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X		X			X	X
Uropappus lindleyi		Silver puffs													X	X																		X	
Xylorhiza tortifolia var. *tortifolia*		Mojave aster	X	X	X		X	X		X			X							X	X	X	X	X										
BORAGINACEAE		BORAGE FAMILY																																	
Amsinckia intermedia	*Amsinckia menziesii var. i.*	Common fiddleneck													X																			X	
Amsinckia menziesii		Fiddleneck			X																														
Amsinckia tessellata var. *tessellata*		Devil's lettuce	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X		X	X	X		X			X	X

BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																	
Cryptantha sp.		Cryptantha	X				X			X						X											X								
Cryptantha barbigera		Bearded cryptantha	X																			X												
Cryptantha circumscissa		Western forget me not	X	X	X					X				X			X			X		X	X	X										X	
Cryptantha circumscissa var. *circumscissa*		Cushion cryptantha								X																									
Cryptantha micrantha		Purple root cryptantha	X							X	X	X	X		X					X	X		X												
Cryptantha nevadensis		Nevada forget me not															X																		
Cryptantha pterocarya		Winged nut forget me not	X		X							X			X		X			X	X		X	X		X									
Cryptantha utahensis		Scented forget me not	X																							X									
Emmenanthe penduliflora var. *penduliflora*		Whispering bells	X																																
Eucrypta chrysanthemifolia var. *chrysan.*		Common eucrypta																																X	
Heliotropium curassavicum		Chinese parsley													X						X	X	X											X	X
Pectocarya sp.		Pectocarya	X									X											X				X								
Pectocarya heterocarpa		Chuckwalla pectocarya										X															X								
Pectocarya linearis ssp. *ferocula*		Slender comb seed	X							X										X															
Pectocarya penicillata		Winged pectocarya		X	X					X		X	X	X	X		X			X	X	X					X								X
Pectocarya platycarpa		Broad nutted comb bur										X																							
Pectocarya setosa		Moth combseed	X							X			X	X	X	X	X			X	X														
Phacelia sp.		Phacelia	X	X	X			X			X										X	X	X												
Phacelia crenulata		Notch leaved phacelia					X			X													X												
Phacelia distans		Common phacelia																			X														
Phacelia fremontii		Fremont's phacelia											X												X		X								
Phacelia nashiana		Charlotte's phacelia																				X													
Phacelia tanacetifolia		Tansy leafed phacelia	X	X	X																	X				X		X						X	X
Pholisma arenarium		Dune food	X		X																														
Pholistoma membranaceum		White fiesta flower	X		X		X								X													X						X	
Plagiobothrys arizonicus		Arizona popcorn flower	X	X	X	X				X		X	X		X				X			X		X											
BRASSICACEAE		MUSTARD FAMILY																																	
Boechera sp.		Rockcress																											X						
Brassica tournefortii		Saharan mustard	X		X	X		X																											
Caulanthus coulteri		Coulter's jewel flower																																X	
Caulanthus lasiophyllus	*Guillenia lasiophylla*	California mustard	X		X		X			X			X								X	X		X											
Descurainia pinnata		Yellow tansy mustard			X									X	X							X		X		X		X						X	
Lepidium flavum		Yellow pepper grass	X									X									X														
Lepidium fremontii	*L. fremontii var. stipitatum*	Desert pepper grass		X	X	X	X			X		X			X						X	X	X	X	X									
Lepidium lasiocarpum ssp. *lasiocarpum*		Sand peppergrass																			X														
Lepidium nitidum	*L. n.itidum var howellii; var. oreganum*	Shining pepper grass										X																							
Sisymbrium sp.		Tumble mustard					X																												
Stanleya pinnata var. *pinnata*		Prince's plume					X														X	X	X	X										X	X
Tropidocarpum gracile		Slender tropidocarpum	X							X		X	X		X		X																		

BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																	
CACTACEAE		CACTUS FAMILY																																	
Cylindropuntia echinocarpa	*Opuntia echinocarpa*	Silver cholla	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X		X				X
Echinocactus polycephalus		Cottontop cactus			X		X																												
Opuntia basilaris var. *basilaris*		Beavertail cactus	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X			X	X
Sclerocactus polyancistrus		Mojave fish hook cactus																				X													
CARYOPHYLLACEAE		PINK FAMILY																																	
Loeflingia squarrosa		Spreading loeflingia											X																						
CHENOPODIACEAE		GOOSEFOOT FAMILY																																	
Atriplex canescens var. *canescens*		Fourwing saltbush		X				X				X			X								X	X	X	X	X	X	X					X	X
Atriplex confertifolia		Shadscale								X												X													
Atriplex hymenelytra		Desert holly					X																												
Atriplex polycarpa		Allscale	X		X	X	X			X		X	X								X	X	X	X	X										
Chenopodium californicum		California goosefoot													X						X														
Grayia spinosa		Hop-sage	X	X	X							X	X	X	X	X	X	X		X	X	X	X	X	X										
Kraschenninnikovia lanata		Winter fat	X		X		X			X			X								X	X	X	X	X									X	X
CLEOMACEAE		SPIDERFLOWER FAMILY																																	
Peritoma arborea var. *angustata*	*Isomeris arborea var. arborea*	Bladderpod	X	X	X	X	X			X		X	X																						
CONVOLVULACEAE		MORNING-GLORY FAMILY																																	
Cuscuta californica		California dodder																			X														
Cuscuta denticulata		Desert dodder			X						X		X																						
CUPRESSACEAE		CYPRESS FAMILY																																	
Juniperus californica		California juniper											X			X						X	X				X		X					X	
CYPERACEAE		SEDGE FAMILY																																	
Carex sp.		Sedge													X							X													
Carex praegracilis		Field sedge																				X													
Schoenoplectus pungens var. longispicatus	*Scirpus americanus var. longispicatus*	Common threesquare													X																				
EPHEDRACEAE		EPHEDRA FAMILY																																	
Ephedra nevadensis		Nevada ephedra	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X			X	X
Ephedra viridis		Green ephedra																								X	X	X							
EUPHORBIACEAE		SPURGE FAMILY																																	
Chamaesyce sp.		Rattlesnake weed					X																												
Chamaesyce albomarginata		Rattlesnake weed								X											X	X	X	X										X	X
Chamaesyce micromera		Desert spurge								X																									
Chamaesyce vallis-mortae		Death valley sandmat								X											X		X											X	X
Croton setigerus	*Eremocarpus setigerus*	Dove weed											X																						
FABACEAE		PEA FAMILY																																	
Acmispon sp.		Lotus				X																	X	X											
Acmispon strigosus	*Lotus subpinnatus*	Strigose lotus	X		X		X								X						X		X												
Acmispon wrangelianus	*Lotus w.; L. subpinnatus*	Lotus	X																																

BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																	
Astragalus sp.		Milkvetch						X		X								X										X							
Astragalus didymocarpus var. *didymocarpus*		Common dwarf milkvetch								X																									
Astragalus lentiginosus var. *variabilis*		Freckled milkvetch												X													X	X	X						
Astragalus pachypus var. *pachypus*		Thick pod milkvetch																			X	X													
Lupinus concinnus		Bajada lupine	X				X														X		X					X					X	X
Lupinus excubitus var. *excubitus*		Grape lupine	X		X		X					X			X					X	X	X	X	X	X		X	X			X			X	
Lupinus shockleyi		Shockley lupine																										X							
Melilotus indicus	*Melilotus indica*	Annual yellow sweetclover																			X	X		X										X	
Prosopis glandulosa var. *torreyana*		Mesquite										X																							
Psorothamnus arborescens var. *minuti.*		Mojave indigo bush	X	X	X	X	X	X	X	X	X	X	X								X	X	X	X	X										
Senna armata		Desert senna		X	X	X	X						X												X										
FAGACEAE		OAK FAMILY																																	
Quercus turbinella		Shrub live oak												X																					
GERANIACEAE		GERANIUM FAMILY																																	
Erodium cicutarium		Redstem filaree	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X			X	X
JUNCACEAE		RUSH FAMILY																																	
Juncus sp.		Rush																			X														
Juncus balticus/mexicanus		Baltic rush/Mexican rush													X						X	X	X	X										X	X
Juncus bufonius var. bufonius		Toad rush																			X														
Juncus xiphioides		Iris leaved rush					X															X														
LAMIACEAE		MINT FAMILY																																	
Marrubium vulgare		Horehound																											X						
Salvia columbariae		Chia sage	X	X	X		X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X			X	X	X		X			X	X
Salvia dorrii var. *dorrii*		Dorr's sage										X							X		X			X											
Scutellaria mexicana	*Salazaria mexicana*	Bladder sage	X	X	X	X	X	X		X	X	X	X		X					X	X	X	X	X	X										X
LILIACEAE		LILY FAMILY																																	
Allium or Calochortus		Onion or mariposa-lily																	X																
Calochortus kennedyi var. kennedyi		Desert mariposa												X		X	X			X	X														
LOASACEAE		LOASA FAMILY																																	
Eucnide urens		Desert bush nettle			X		X																												
Mentzelia sp.		Blazing star			X		X							X		X	X										X								
Mentzelia albicaulis		White stemmed blazing star	X																		X		X											X	
Mentzelia veatchiana		Veatch's blazing star																					X			X									
Petalonyx nitidus		Shiny leaf sandpaper plant	X		X																														
MALVACEAE		MALLOW FAMILY																																	
Eremalche exilis		White mallow	X																																
Sphaeralcea ambigua var. *ambigua*		Apricot mallow	X									X				X	X	X	X	X	X	X					X	X	X		X			X	X
MONTIACEAE		MINER'S LETTUCE FAMILY																																	
Calandrinia ciliata		Redmaids	X									X																							

BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																	
NYCTAGINACEAE		FOUR-O'CLOCK FAMILY																																	
Mirabilis laevis	*Includes M. californica, M. bigelovii*	Desert wishbone bush	X	X	X		X			X	X	X	X	X						X	X	X	X	X											X
Mirabilis laevis var. *crassifolia*	*M. californica*	California four o'clock									X																								
Mirabilis laevis var. *retrorsa*	*M. bigelovii var. retrorsa*	Wishbone bush																		X															X
OLEACEAE		OLIVE FAMILY																																	
Camissonia sp.		Primrose											X													X									
Camissonia campestris		Field primrose								X				X	X		X			X	X	X	X	X			X							X	
Chylismia claviformis ssp. *claviformis*	*Camissonia claviformis*	Evening-primrose	X	X	X		X			X			X								X	X	X	X		X								X
Eremothera boothii ssp. *desertorum*	*Camissonia boothii ssp. desertorum*	Woody bottle washer	X	X	X	X	X			X			X							X	X	X	X	X		X								
Oenothera sp.		Evening primrose						X																											
Tetrapteron palmeri	*Oenothera palmeri*	Evening primrose															X			X															
OROBANCHACEAE		BROOMRAPE FAMILY																																	
Castilleja chromosa	*Castilleja angustifolia*	Desert paintbrush																				X													
Castilleja foliolosa		Texas paintbrush	X																		X		X												
PAPAVERACEAE		POPPY FAMILY																																	
Eschscholzia californica		California poppy	X																																
Eschscholzia minutiflora var. minutiflora		Coville's poppy	X												X							X	X	X											
Platystemon californicus		Cream cups	X																																
PLANTAGINACEAE		PLAINTAIN FAMILY																																	
Penstemon incertus		Western desert penstemon			X									X												X	X								
Plantago ovata		Desert plantain			X	X	X			X			X									X													
Veronica anagallis-aquatica		Water speedwell													X																				
POACEAE		GRASS FAMILY																																	
Bromus berteroanus	*Bromus trinii*	Chilean chess									X																								
Bromus diandrus		Ripgut brome																																X	
Bromus madritensis ssp. *rubens*		Red brome	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X			X	X
Bromus tectorum		Cheatgrass	X	X	X	X	X			X	X	X		X	X	X		X	X		X	X	X	X		X	X	X	X				X	X
Distichlis spicata		Salt grass													X						X	X												X	
Elymus elymoides var. *elymoides*		Squirreltail									X			X	X					X		X				X		X	X		X				
Elymus multisetus		Big squirreltail								X											X														X
Elymus triticoides		Beardless wild rye																			X	X													X
Festuca microstachys	*Vulpia microstachys*	Fescue											X																						
Hordeum marinum ssp. *gussoneanum*		Barley																				X													
Hordeum murinum ssp. *leporinum*		Farmer's foxtail													X						X								X						
Melica sp.		California melic																																	X
Muhlenbergia rigens		Deergrass					X																												
Poa secunda ssp. *secunda*		Sandberg's bluegrass	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X
Polypogon monspeliensis		Annual beard grass					X													X	X														
Schismus sp.		Mediterranean grass	X	X	X	X	X	X	X	X	X	X			X	X	X				X	X	X	X	X				X						

BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																	
Schismus barbatus		Mediterranean grass																	X															X	X
Sporobolus airoides		Alkali sacaton																				X													
Stipa hymenoides	*Achnatherum hymenoides*	Sand grass								X	X		X													X									
Stipa speciosa	*Achnatherum speciosum*	Desert needlegrass	X	X	X		X	X	X	X	X	X		X	X		X		X	X		X	X	X	X	X	X	X	X		X			X	X
POLEMONIACEAE		PHLOX FAMILY																																	
Eriastrum sp.		Desert woollystar	X	X						X	X	X			X	X	X	X	X	X		X	X	X		X	X	X	X		X				X
Eriastrum densifolium ssp. *mohavense*		Perennial woolly star											X													X		X							X
Eriastrum diffusum		Miniature woolly star	X							X										X	X	X	X		X										
Gilia sp.		Gilia	X		X																					X		X							
Gilia brecciarum		Small gilia															X																		
Gilia scopulorum		Rock gilia	X																				X												
Leptosiphon aureus ssp. *aureus*	*Linanthus aureus ssp. aureus*	Golden linanthus								X								X	X							X									
Loeseliastrum matthewsii		Desert calico	X				X			X				X	X		X	X	X	X	X	X	X	X	X			X	X				X	X
POLYGONACEAE		BUCKWHEAT FAMILY																																	
Centrostegia thurberi		Red triangles									X					X	X			X		X	X			X									
Chorizanthe brevicornu		Brittle spine flower								X														X											
Chorizanthe spinosa		Mojave spineflower											X																						
Chorizanthe watsonii		Watson's spineflower															X			X															
Eriogonum sp.		Buckwheat								X			X				X	X	X	X				X	X		X	X			X				
Eriogonum brachyanthum		Yellow buckwheat												X																					
Eriogonum brachypodum		Parry's buckwheat															X																		
Eriogonum clavatum		Buckwheat					X			X												X													
Eriogonum davidsonii		Davidson buckwheat	X																	X		X													
Eriogonum deflexum		Flat topped buckwheat	X	X			X			X		X					X			X	X	X												X	
Eriogonum fasciculatum var. *polifolium*		California buckwheat	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
Eriogonum gracillimum		Rose and white buckwheat								X											X														
Eriogonum heermannii		Heerman buckwheat			X		X																											X	
Eriogonum inflatum var. *inflatum*		Desert trumpet	X	X	X		X			X	X	X	X					X		X	X	X	X	X	X										
Eriogonum maculatum		Angle stermed buckwheat	X																																
Eriogonum nidularium		Whisk broom								X																									
Eriogonum nudum		Weston's buckwheat			X							X										X	X		X										
Eriogonum nudum var. *westonii*		Weston's buckwheat	X				X					X								X	X	X	X	X											
Eriogonum plumatella		Flat topped buckwheat																									X	X	X		X			X	X
Eriogonum pusillum		Yellow turban	X	X	X	X				X		X			X						X	X	X	X		X								X	
Eriogonum reniforme		Kidney leaf buckwheat			X																														
Eriogonum trichopes		Little desert buckwheat		X																															
Mucronea perfoliata		California spineflower																		X															
Oxytheca perfoliata		Saucer plant											X								X														
Rumex sp.		Dock													X																				

BOLD indicates special-status species		PARCEL CODE	J-1	J-2	J-3	J-4	J-5	S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10
Taxon	**Synonymy**	**Common name**																																	
RANUNCULACEAE		BUTTERCUP FAMILY																																	
Delphinium sp.		Larkspur			X																	X													
ROSACEAE		ROSE FAMILY																																	
Coleogyne ramosissima		Blackbush	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Prunus andersonii		Desert peach													X																				
Prunus fasciculata var. *fasciculata*		Desert almond	X		X		X																												
Purshia tridentata		Bitterbrush																			X	X	X	X		X									
RUBIACEAE		MADDER FAMILY																																	
Galium sp.		Bedstraw			X																		X												
SALICACEAE		WILLOW FAMILY																																	
Populus fremontii ssp. *fremontii*		Fremont cottonwood											X									X												X	X
Salix sp.		Willow											X		X																				
Salix exigua var. *exigua*		Sandbar willow																			X														X
Salix laevigata		Polished willow					X						X																					X	X
Salix lasiolepis		Arroyo willow																			X		X	X										X	X
SAURURACEAE		LIZARD'S TAIL FAMILY																																	
Anemopsis californica		Yerba mansa													X							X													
SIMAROUBACEAE		SIMAROUBA FAMILY																																	
Ailanthus altissima		Tree of heaven																																X	
SOLANACEAE		POTATO FAMILY																																	
Datura wrightii		Jimsonweed	X		X		X																X											X	
Lycium andersonii		Anderson's box thorn	X	X	X		X			X	X			X		X	X		X	X	X	X	X	X			X	X	X					X	X
Lycium cooperi		Cooper's box thorn	X	X	X			X		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X
TAMARICACEAE		TAMARISK FAMILY																																	
Tamarix chinensis		Chinese tamarisk																			X		X	X											
Tamarix ramosissima		Tamarisk																					X	X											
TYPHACEAE		CATTAIL TAMILY																																	
Typha latifolia		Cattail					X															X												X	
URTICACEAE		NETTLE FAMILY																																	
Urtica dioica ssp. *holosericea*		Stinging nettle																																X	
ZYGOPHYLLACEAE		CALTROP FAMILY																																	
Larrea tridentata		Creosote bush	X	X	X	X	X	X	X	X	X	X				X	X		X	X	X	X	X	X	X				X		X				X

Appendix C. Plant Species Observed, by Parcel, Eastern Kern County Acquisition Project, Western Parcels

APPENDIX C. PLANT SPECIES OBSERVED, BY PARCEL, EASTERN KERN COUNTY ACQUISITION PROJECT, WESTERN PARCELS																													
BOLD indicates special-status species		PARCEL CODE	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-1	L-2	L-3	C-1	C-2	C-4
Taxon	**Synonymy**	**Common name**																										
ADOXACEAE		MUSKROOT FAMILY																										
Sambucus nigra ssp. *caerulea*	*Sambucus mexicana*	Blue elderberry									X																	
AGAVACEAE		AGAVE FAMILY																										
Hesperoyucca whipplei	*Yucca whippleyi*	Chaparral yucca	X	X							X							X										
Yucca brevifolia		Joshua tree	X	X	X	X	X	X			X	X			X	X			X	X	X	X						
AMARANTHACEAE		AMARANTH FAMILY																										
Nitrophila occidentalis		Western nitrophila																				X						
APIACEAE		CARROT FAMILY																										
Apium graveolens		Celery or smallage													X													
Lomatium sp.		Lomatium				X				X	X											X						
Lomatium macrocarpum		Large fruited lomatium								X																		
Lomatium mohavense		Mohave wild parsely	X	X		X					X					X		X		X	X							
Perideridia parishii		Parish's yampah																					X					
Tauschia parishii		Parish's tauschia	X															X										
APOCYNACEAE		DOGBANE FAMILY																										
Apocynum sp.		Dogbane											X															
ASCLEPIADACEAE		MILKWEED FAMILY																										
Asclepias californica		California milkweed	X	X							X							X										
Asclepias erosa		Desert milkweed																		X								
Asclepias fascicularis		Milkweed									X		X		X							X						
ARACEAE		ARUM FAMILY																										
Lemna sp.		Duckweed													X													
ASTERACEAE		SUNFLOWER FAMILY																										
Acamptopappus sphaerocephalus		Goldenhead														X												
Achillea millefolium		Yarrow																						X				
Agoseris heterophylla		Mountain dandelion													X													
Ambrosia acanthicarpa		Annual bursage													X													
Ambrosia salsola var. *salsola*	*Hymenoclea salsola var. salsola*	Cheesebush					X	X					X			X				X	X							
Anaphalis margaritacea		Pearly everlasting																					X					
Anisocoma acaulis		Scale bud				X											X	X										
Artemisia dracunculus		Tarragon																				X	X					
Artemisia tridentata		Big sage	X			X	X	X		X	X			X	X	X		X	X	X	X	X	X	X		X	X	X
Baccharis salicifolia	*B. glutinosa*	Mule fat, seep willow	X								X		X		X							X						
Brickellia desertorum		Desert brickellia																X										
Chaenactis stevioides		Esteve pincushion				X																						
Chrysothamnus viscidiflorus ssp. *viscidiflorus*		Sticky leaved rabbitbrush																					X	X	X			
Cirsium arvense		Canada thistle													X													
Cirsium occidentale		Western thistle									X							X										

BOLD indicates special-status species		PARCEL CODE	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-1	L-2	L-3	C-1	C-2	C-4
Taxon	**Synonymy**	**Common name**																										
Corethrogyne filaginifolia	*Lessingia filaginifolia*	Common sandaster	X	X							X						X	X										
Encelia actoni		Acton's encelia	X													X												
Ericameria cuneata		Rock goldenbush	X			X				X			X				X	X										
Ericameria linearifolia		Interior goldenbush	X	X		X	X	X			X	X			X	X				X	X	X						
Ericameria nauseosa	*Chrysothamnus nauseosus*	Rubber rabbitbrush	X	X		X	X	X		X	X	X			X	X	X	X	X	X	X	X	X	X	X			
Ericameria teretifolia	*Chrysothamnus teretifolium*	Green rabbitbrush	X		X		X	X	X							X				X	X							
Erigeron foliosus		Fleabane				X										X		X										
Erigeron foliosus var. *foliosus*		Thread stemmed fleabane									X																	
Erigeron foliosus var. *hartwegii*		Hartweg's fleabane								X																		
Eriophyllum sp.		Woolly sunflower									X																	
Eriophyllum ambiguum		Annual woolly sunflower		X													X											
Eriophyllum ambiguum var. *paleaceum*		Annual woolly sunflower																				X						
Eriophyllum confertiflorum var. *confertiflorum*		Golden yarrow								X	X							X										
Eriophyllum lanatum var. *obovatum*		Southern sierra woolly sunflower															X											
Eriophyllum pringlei		Pringle eriophyllum	X	X		X	X	X			X	X				X		X	X	X	X							
Gutierrezia microcephala		Sticky snakeweed													X					X								
Heterotheca sessiliflora		Goldenaster		X												X		X				X						
Hieracium horridum		Shaggy hawkweed								X																		
Iva axillaris		Poverty weed																				X						
Lasthenia californica		Goldfields									X				X				X	X		X						
Layia glandulosa		White layia	X	X		X	X	X									X											
Lepidospartum squamatum		Scalebroom											X															
Leptosyne bigelovii	*Coreopsis bigelovii*	Coreopsis				X					X						X	X										
Lessingia glandulifera var. *peirsonii*		Vinegar weed	X	X		X	X	X				X				X				X	X		X					
Logfia filaginoides	*Filago californica*	California cottonrose									X																	
Malacothrix glabrata		Desert dandelion													X				X									
Matricaria discoidea	*Chamomilla suaveolens*	Pineapple weed, chamomile													X							X	X					
Senecio flaccidus		Shrubby ragwort									X					X		X	X	X		X						
Senecio flaccidus var. *monoensis*		Mono groundsel	X																									
Sonchus asper ssp. *asper*		Sow thistle		X							X																	
Stephanomeria exigua		Small wirelettuce	X	X			X	X							X	X				X		X						
Stephanomeria exigua ssp. *exigua*		Mitra		X																								
Stephanomeria pauciflora		Wire lettuce									X							X			X							
Syntrichopappus fremontii		Fremont's syntrichopappus														X												
Taraxacum officinale		Red seeded dandelion													X													
Tetradymia sp.		Horsebrush								X																		
Tetradymia axillaris var. axillaris		Catclaw horsebrush										X	X		X				X	X		X						
Tetradymia axillaris var. *longispina*		Catclaw horsebrush														X					X							
Tetradymia canescens		Gray horsebrush								X														X	X			

BOLD indicates special-status species		PARCEL CODE	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-1	L-2	L-3	C-1	C-2	C-4
Taxon	**Synonymy**	**Common name**																										
Tetradymia glabrata		Little leaf horsebrush					X	X																				
Tetradymia stenolepis		Mojave horsebrush					X	X				X				X				X	X							
Xanthium strumarium		Cocklebur	X																									
BORAGINACEAE		BORAGE FAMILY																										
Amsinckia tessellata var. *tessellata*		Devil's lettuce	X	X		X	X	X			X	X			X	X	X	X	X	X	X							
Cryptantha sp.		Cryptantha		X							X																	
Cryptantha circumscissa		Western forget me not		X		X	X	X			X					X	X			X	X		X					
Cryptantha echinella		Prickly cryptantha									X																	
Cryptantha micrantha		Purple root cryptantha															X			X								
Cryptantha nevadensis		Nevada forget me not																X										
Cryptantha oxygona		Sharp nut cryptantha									X																	
Cryptantha pterocarya		Winged nut forget me not				X											X											
Heliotropium curassavicum		Chinese parsley											X		X				X			X						
Hesperochiron californicus		California hesperochiron													X													
Pectocarya sp.		Pectocarya					X	X												X		X						
Pectocarya heterocarpa		Chuckwalla pectocarya					X	X																				
Pectocarya penicillata		Winged pectocarya					X	X							X				X									
Pectocarya setosa		Moth combseed									X				X	X				X	X							
Phacelia cicutaria		Caterpillar phacelia																X										
Phacelia crenulata		Notch leaved phacelia		X																								
Phacelia davidsonii		Davidson's phacelia								X																		
Phacelia distans		Common phacelia				X																						
Phacelia fremontii		Fremont's phacelia				X										X												
Phacelia imbricata		Imbricate phacelia															X	X										
Phacelia ramosissima		Branching phacelia									X																	
Phacelia species		Phacelia	X	X							X																	
Pholisma arenarium		Dune food											X															
Pholistoma auritum var. *auritum*		Blue fiesta flower									X																	
Pholistoma membranaceum		White fiesta flower											X															
Plagiobothrys sp.		Popcorn flower									X																	
Plagiobothrys arizonicus		Arizona popcorn flower					X	X			X						X			X								
BRASSICACEAE		MUSTARD FAMILY																										
Boechera pulchra	*Arabis pulchra*	Beautiful rockcress									X										X							
Boechera sp.		Rockcress									X																	
Caulanthus lasiophyllus	*Guillenia lasiophylla*	California mustard																			X							
Descurainia pinnata		Yellow tansy mustard				X														X								
Descurainia sophia		Herb sophia													X							X	X					
Erysimum capitatum var. *capitatum*	*incl. E. capitatum var.. angustatum*	Sanddune wallflower									X							X										
Erysimum capitatum var. *purshii*		Pursh's wallflower								X													X					

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Taxon	**Synonymy**	**Common name**																										
Hirschfeldia incana		Summer mustard													X							X						
Hornungia procumbens	*Hutchinsia procumbens*	Prostrate hutchinsia																				X						
Lepidium sp.		Pepper grass													X							X						
Lepidium appelianum	*Cardaria pubescens*	Hairy whitetop													X													
Lepidium draba	*Cardaria draba*	Whitetop																				X						
Lepidium perfoliatum		Klamath pepper grass													X				X	X		X						
Nasturtium officinale	*Rorippa nasturtium-aquaticum*	Watercress	X																									
Sisymbrium sp.		Tumble mustard																		X		X						
Sisymbrium altissimum		Tumble mustard									X				X				X				X					
Stanleya pinnata var. *pinnata*		Prince's plume											X															
CACTACEAE		CACTUS FAMILY																										
Cylindropuntia echinocarpa	*Opuntia echinocarpa*	Silver cholla	X	X		X	X	X			X	X			X	X			X	X	X							
Opuntia basilaris var. *basilaris*		Beavertail cactus	X	X		X	X	X			X				X	X		X	X	X	X	X						
CAMPANULACEAE		BELLFLOWER FAMILY																										
Nemacladus sp.		Thread plant				X																						
CAPRIFOLIACEAE		HONEYSUCKLE FAMILY																										
Symphoricarpos rotundifolius		Mountain snowberry																							X			
CARYOPHYLLACEAE		PINK FAMILY																										
Minuartia sp.		Sandwort															X											
CHENOPODIACEAE		GOOSEFOOT FAMILY																										
Atriplex canescens var. *canescens*		Fourwing saltbush	X								X		X			X				X								
Chenopodium album		Lambs quarters	X												X							X						
Chenopodium californicum		California goosefoot	X																			X						
Grayia spinosa		Hop-sage													X							X						
CLEOMACEAE		SPIDERFLOWER FAMILY																										
Cleomella parviflora		Slender cleomella													X							X						
CONVOLVULACEAE		MORNING-GLORY FAMILY																										
Calystegia longipes		Piute morning glory									X																	
Cuscuta sp.		Dodder	X																									
Cuscuta californica		California dodder										X																
Cuscuta denticulata		Desert dodder																		X								
CRASSULACEAE		STONECROP FAMILY																										
Dudleya lanceolata		Southern california dudleya									X																	
CUPRESSACEAE		CYPRESS FAMILY																										
Juniperus californica		California juniper	X	X										X	X	X				X	X	X				X		X
CYPERACEAE		SEDGE FAMILY																										
Carex sp.		Sedge													X							X	X	X				
Eleocharis parishii		Parish's spike rush	X	X											X													
Eleocharis quinqueflora		Fewflower spikerush													X													

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Taxon	**Synonymy**	**Common name**																										
EPHEDRACEAE		EPHEDRA FAMILY																										
Ephedra nevadensis		Nevada ephedra	X	X			X	X			X	X	X			X				X	X							
Ephedra viridis		Green ephedra	X			X	X	X			X							X		X	X							
EQUISETACEAE		HORSETAIL FAMILY																										
Equisetum sp.		Horsetail									X																	
ERICACEAE		HEATHER FAMILY																										
Arctostaphylos glauca		Bigberry manzanita								X																		
Arctostaphylos patula		Green leaf manzanita																						X	X			
EUPHORBIACEAE		SPURGE FAMILY																										
Chamaesyce albomarginata		Rattlesnake weed	X	X		X	X	X			X		X			X		X	X	X	X	X						
Chamaesyce vallis-mortae		Death valley sandmat	X	X		X	X	X					X		X	X		X	X			X						
FABACEAE		PEA FAMILY																										
Acmispon sp.		Lotus		X		X					X																	
Acmispon argophyllus	*Lotus argophyllus*	Lotus	X	X														X										
Acmispon strigosus	*Lotus subpinnatus*	Strigose lotus	X														X	X										
Acmispon wrangelianus	*Lotus w.; L. subpinnatus*	Lotus		X																								
Astragalus lentiginosus var. *variabilis*		Freckled milkvetch				X	X	X				X			X	X				X	X							
Glycyrrhiza lepidota		Wild licorice																				X						
Hosackia crassifolia var. *crassifolia*	*Lotus crassifolius var. crassifolius*	Broad leaved lotus									X																	
Lotus corniculatus		Bird's foot trefoil													X							X						
Lupinus sp.		Lupine								X	X												X					
Lupinus bicolor		Miniature lupine															X	X										
Lupinus breweri var. *grandiflorus*		Showy brewer's lupine								X																		
Lupinus elatus		Silky lupine																		X								
Lupinus excubitus var. *excubitus*		Grape lupine	X	X							X		X		X	X	X	X	X	X	X	X						
Melilotus indicus	*Melilotus indica*	Annual yellow sweetclover	X																			X						
Trifolium sp.		Clover													X													
FAGACEAE		OAK FAMILY																										
Quercus agrifolia		Coast live oak																X										
Quercus chrysolepis		Gold cup live oak								X															X			
Quercus douglasii		Blue oak																				X				X	X	X
Quercus garryana var. *breweri*		Oregon oak								X															X			
Quercus wislizeni		Interior live oak, chaparral oak								X	X			X			X											X
Quercus wislizeni var. *frutescens*		Interior scrub oak																X				X						
GARRYACEAE		SILKTASSEL FAMILY																										
Garrya flavescens		Ashy silk tassel												X				X										
GERANIACEAE		GERANIUM FAMILY																										
Erodium cicutarium		Redstem filaree	X	X		X	X	X			X	X			X	X	X	X	X	X	X	X						
Geranium californicum		California geranium																					X					

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Taxon	**Synonymy**	**Common name**																										
GROSSULARIACEAE		GOOSEBERRY FAMILY																										
Ribes quercetorum		Oak gooseberry	X	X							X																	
IRIDACEAE		IRIS FAMILY																										
Sisyrinchium sp. (may be *S. halophilum*)		Blue eyed grass													X							X						
JUNCACEAE		RUSH FAMILY																										
Juncus balticus/mexicanus		Baltic rush/Mexican rush	X										X		X				X			X	X	X				
Juncus bufonius var. bufonius		Toad rush													X													
Juncus xiphioides		Iris leaved rush									X		X										X					
LAMIACEAE		MINT FAMILY																										
Monardella exilis		Mojave monardella					X	X								X												
Monardella linoides		Narrow leaved monardella																							X			
Monardella linoides ssp. *linoides*		Flax like monardella								X	X																	
Monardella odoratissima ssp. *glauca*		Monardella																X										
Salvia columbariae		Chia sage	X	X		X					X					X		X		X	X	X						
Salvia dorrii var. *dorrii*		Dorr's sage																		X	X							
Scutellaria mexicana	*Salazaria mexicana*	Bladder sage																			X							
LILIACEAE		LILY FAMILY																										
Calochortus kennedyi var. kennedyi		Desert mariposa																			X							
Calochortus palmeri var. palmeri		Palmer's mariposa-lily									X																	
Calochortus kennedyi var. kennedyi		Desert mariposa																			X							
Calochortus palmeri var. palmeri		Palmer's mariposa-lily									X																	
Calochortus venustus		Butterfly mariposa-lily									X																	
LOASACEAE		LOASA FAMILY																										
Mentzelia sp.		Blazing star				X										X												
Mentzelia congesta		Clustered blazing star															X	X										
MALVACEAE		MALLOW FAMILY																										
Eremalche exilis		White mallow																		X								
Fremontodendron californicum		California fremontia									X			X				X										
Malacothamnus fremontii		Fremont's bush mallow									X																	
Sidalcea sp.		Checkerbloom													X													
Sidalcea sparsifolia		Southern checkerbloom													X							X						
Sphaeralcea ambigua var. *ambigua*		Apricot mallow													X	X			X	X	X							
Sphaeralcea ambigua var. *rosacea*		Rosy apricot mallow									X											X						
MONTIACEAE		MINER'S LETTUCE FAMILY																										
Calyptridium monandrum		Common pussypaws	X															X										
NYCTAGINACEAE		FOUR-O'CLOCK FAMILY																										
Abronia pogonantha		Mohave sand verbena																					X					
Mirabilis laevis	*Includes M. californica, M. bigelovii*	Desert wishbone bush		X		X										X												
Mirabilis laevis var. *retrorsa*	*M. bigelovii var. retrorsa*	Wishbone bush																			X							
OLEACEAE		OLIVE FAMILY																										
Forestiera pubescens		Desert olive									X																	

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Taxon	**Synonymy**	**Common name**																										
Camissonia sp.		Primrose																							X			
Camissonia campestris		Field primrose				X	X	X				X									X							
Chylismia claviformis ssp. *claviformis*	*Camissonia claviformis*	Evening-primrose	X	X																								
Epilobium canum ssp. *canum*		California fuchsia									X																	
Oenothera californica ssp. *californica*		California evening primrose	X	X			X	X			X				X	X		X	X			X						
OROBANCHACEAE		BROOMRAPE FAMILY																										
Castilleja sp.		Paintbrush								X	X				X													
Castilleja applegatei		Wavy leaf paintbrush																					X					
Castilleja applegatei ssp. *martinii*		Martin's paintbrush									X																	
Castilleja minor ssp. *spiralis*		Lesser paintbrush																X										
Castilleja plagiotoma		Mojave paintbrush													X													
Pedicularis semibarbata		Pine woods lousewort								X																		
PAPAVERACEAE		POPPY FAMILY																										
Argemone munita		Prickly poppy													X	X			X					X				
Eschscholzia californica		California poppy		X							X						X	X										
Platystemon californicus		Cream cups															X											
PHYRMACEAE		LOPSEED FAMILY																										
Mimulus sp.		Monkeyflower													X													
Mimulus aurantiacus		Sticky monkeyflower	X	X														X										
Mimulus guttatus		Yellow monkeyflower	X								X				X													
PINACEAE		PINE FAMILY																										
Abies concolor		White fir								X																		
Pinus jeffreyi		Jeffrey pine		X			X	X		X				X			X						X	X	X			
Pinus lambertiana		Sugar pine								X																		
Pinus monophylla		Single leaf pinyon	X											X			X	X					X	X	X			X
Pinus sabiniana		Gray pine									X						X	X				X				X	X	X
PLANTAGINACEAE		PLAINTAIN FAMILY																										
Keckiella breviflora		Gaping keckiella																					X					
Penstemon sp.		Penstemon				?				X																		
Penstemon incertus		Western desert penstemon	X			X	X	X			X				X	X		X		X	X							
Penstemon rostriflorus		Bridge's penstemon																					X		X			
Penstemon speciosus		Showy penstemon								X													X					
Plantago lanceolata		Ribwort																				X						
Veronica anagallis-aquatica		Water speedwell	X	X							X				X													
POACEAE		GRASS FAMILY																										
Agrostis sp.		Bent grass	X																									
Avena barbata		Slender wild oat									X		X															
Avena fatua		Wild oat																X										
Bromus berteroanus	*Bromus trinii*	Chilean chess	X								X																	

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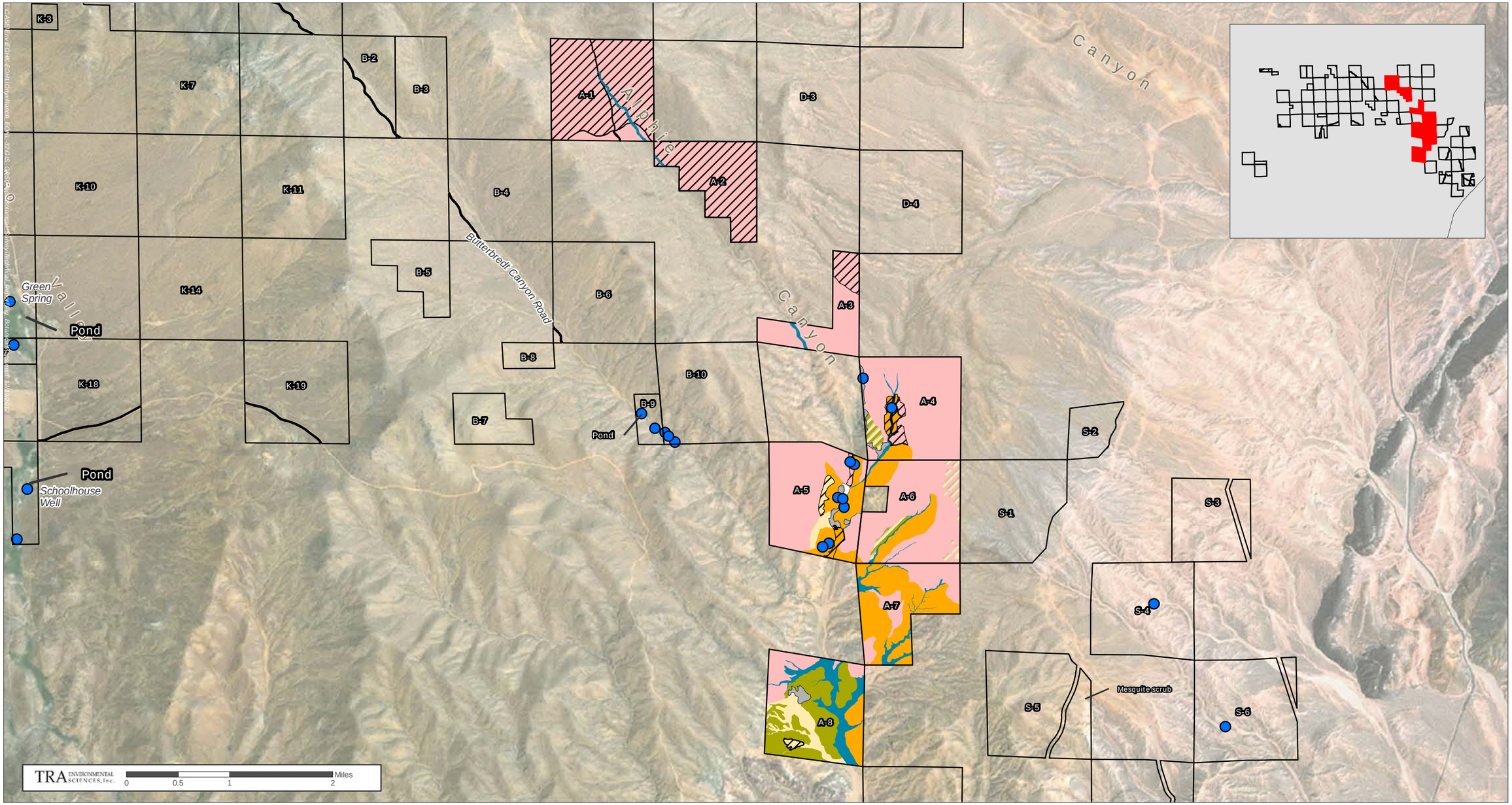
Taxon	**Synonymy**	**Common name**																										
Bromus carinatus var. *carinatus*		California brome	X												X		X	X				X						
Bromus diandrus		Ripgut brome	X								X				X		X	X				X						
Bromus hordeaceus		Soft chess													X							X						
Bromus madritensis ssp. *rubens*		Red brome		X		X	X	X			X	X			X	X			X	X	X	X						
Bromus tectorum		Cheatgrass	X	X		X	X	X		X	X	X			X	X	X	X	X	X	X	X	X	X	X			
Distichlis spicata		Salt grass	X												X				X			X	X					
Elymus elymoides var. *elymoides*		Squirreltail				X				X												X	X	X	X			
Elymus multisetus		Big squirreltail	X	X		X	X	X		X	X	X	X		X	X				X	X							
Elymus triticoides		Beardless wild rye											X		X					X		X	X	X				
Festuca sp.		Fescue													X													
Festuca bromoides	*Vulpia bromoides*	Brome fescue															X											
Festuca octoflora	*Vulpia octoflora*	Sixweeks grass										X					X			X	X	X						
Festuca perennis	*Lolium multiflorum*	Rye grass													X													
Hordeum brachyantherum		Meadow barley													X							X						
Hordeum marinum ssp. *gussoneanum*		Barley																				X						
Hordeum murinum ssp. *leporinum*		Farmer's foxtail	X												X							X						
Melica imperfecta		Coast range melic	X	X		X					X		X				X				X							
Melica stricta		Rock melic													X													
Muhlenbergia rigens		Deergrass									X							X										
Poa annua		Annual blue grass													X													
Poa bulbosa		Bulbous blue grass													X													
Poa secunda ssp. *secunda*		Sandberg's bluegrass	X			X	X	X		X	X	X				X	X			X	X	X	X	X				
Polypogon interruptus		Ditch beard grass	X																									
Polypogon monspeliensis		Annual beard grass									X		X		X													
Schismus barbatus		Mediterranean grass													X													
Sporobolus airoides		Alkali sacaton													X							X						
Stipa hymenoides	*Achnatherum hymenoides*	Sand grass																					X					
Stipa speciosa	*Achnatherum speciosum*	Desert needlegrass	X	X		X	X	X		X	X	X			X	X		X		X	X	X		X				
POLEMONIACEAE		PHLOX FAMILY																										
Eriastrum sp.		Desert woollystar		X												X												
Eriastrum densifolium		Giant eriastrum								X										X								
Eriastrum densifolium ssp. *mohavense*		Perennial woolly star														X					X							
Eriastrum diffusum		Miniature woolly star											X															
Eriastrum pluriflorum		Many flowered eriastrum									X																	
Eriastrum sapphirinum		Sapphire eriastrum	X			X														X	X							
Eriastrum signatum		Eriastrum									X				X				X	X								
Gilia sp.		Gilia								X													X	X				
Gilia capitata		Blue field gilia															X	X										
Gilia ochroleuca ssp. *bizonata*		Volcanic gilia																X										

BOLD indicates special-status species		PARCEL CODE	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-1	L-2	L-3	C-1	C-2	C-4
Taxon	**Synonymy**	**Common name**																										
Leptosiphon aureus ssp. *aureus*	*Linanthus aureus ssp. aureus*	Golden linanthus	X			X	X	X			X										X							
Leptosiphon parviflorus	*Linanthus parviflorus*	Variable linanthus															X											
Linanthus parryae		Parry s linanthus				X														X								
Loeseliastrum matthewsii		Desert calico	X	X		X	X	X				X				X				X	X							
Phlox austromontana		Southern mountain phlox								X																		
POLYGONACEAE		BUCKWHEAT FAMILY																										
Centrostegia thurberi		Red triangles				X										X												
Chorizanthe watsonii		Watson's spineflower														X					X							
Eriogonum sp.		Buckwheat								X		X			X		X						X	X				
Eriogonum baileyi var. *baileyi*		Bailey's buckwheat				X					X				X	X			X	X	X							
Eriogonum davidsonii		Davidson buckwheat													X				X									
Eriogonum deflexum		Flat topped buckwheat	X																									
Eriogonum fasciculatum var. *polifolium*		California buckwheat	X	X	X	X	X	X	X		X	X			X	X		X		X						X		X
Eriogonum gracile var. *gracile*		Slender buckwheat													X													
Eriogonum inflatum var. *inflatum*		Desert trumpet									X																	
Eriogonum nudum		Weston's buckwheat															X											
Eriogonum nudum var. *westonii*		Weston's buckwheat									X					X		X		X								
Eriogonum plumatella		Flat topped buckwheat					X	X				X	X							X								
Eriogonum pusillum		Yellow turban				X																						
Eriogonum roseum		Wand buckwheat																X				X						
Eriogonum umbellatum		Sulphur buckwheat																								X		
Eriogonum wrightii var. *subscaposum*		Wright's buckwheat								X																		
Eriogonum wrightii var. *wrightii*		Wright's buckwheat	X	X		X				X	X			X	X	X		X		X	X	X						
Polygonum sp.		Knotweed																				X						
Pterostegia drymarioides		Fairy mist																X										
Rumex sp.		Dock	X								X				X							X	X					
Rumex salicifolius		Willow leaved dock	X																									
POTAMOGETONACEAE		PONDWEED FAMILY																										
Stuckenia pectinata	*Potamogeton pectinata*	Sago pondweed	X																									
PTERIDACEAE		BRAKE FAMILY																										
Cheilanthes covillei		Coville's lip fern	X	X														X			X							
RANUNCULACEAE		BUTTERCUP FAMILY																										
Clematis ligusticifolia		Creek clematis									X																	
Delphinium hansenii ssp. *kernense*		Kern larkspur									X																	
Delphinium parryi ssp. *parryi*		San bernardino larkspur									X																	
RHAMNACEAE		BUCKTHORN FAMILY																										
Ceanothus cuneatus var. *cuneatus*		Wedgeleaf ceanothus								X	X			X				X				X				X		
Ceanothus leucodermis		Chaparral whitethorn															X	X										
Ceanothus vestitus		Mojave ceanothus									X																	

BOLD indicates special-status species		PARCEL CODE	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-1	L-2	L-3	C-1	C-2	C-4
Taxon	**Synonymy**	**Common name**																										
Frangula californica ssp. *tomentella*	*Rhamnus tomentella ssp. tomentella*	Hoary coffeeberry	X	X							X							X										
Rhamnus crocea		Redberry									X																	
Rhamnus ilicifolia		Evergreen buckthorn									X																	
ROSACEAE		ROSE FAMILY																										
Cercocarpus sp.		Mountain mahogany								X																		
Cercocarpus betuloides var. *betuloides*		Birch leaf mountain mahogany									X							X					X					
Coleogyne ramosissima		Blackbush		X	X	X	X	X	X		X	X			X	X				X	X	X						
Holodiscus discolor		Oceanspray								X																		
Potentilla gracilis		Northwest cinquefoil									X																	
Prunus fasciculata		Desert almond				X																						
Prunus fasciculata var. *fasciculata*		Desert almond																			X	X						
Purshia tridentata		Bitterbrush		X		X	X	X													X							
Rosa woodsii		Woods' rose									X																	
Rosa woodsii ssp. *ultramontana*		Interior rose																					X					
RUBIACEAE		MADDER FAMILY																										
Galium andrewsii		Phlox leaved bedstraw																X										
Galium hallii		Nodding bedstraw																X										
Galium porrigens		Climbing bedstraw									X																	
SALICACEAE		WILLOW FAMILY																										
Populus fremontii ssp. *fremontii*		Fremont cottonwood													X													
Salix sp.		Willow																					X					
Salix exigua var. *exigua*		Sandbar willow									X				X								X					
Salix gooddingii		Gooding's willow											X															
Salix laevigata		Polished willow	X	X							X				X			X										
Salix lasiolepis		Arroyo willow									X																	
Salix scouleriana		Scouler willow								X																		
SAURURACEAE		LIZARD'S TAIL FAMILY																										
Anemopsis californica		Yerba mansa	X										X		X							X						
SCROPHULARIACEAE		FIGWORT FAMILY																										
Scrophularia californica		California bee plant	X															X										
Scrophularia desertorum		Desert figwort																			X							
SIMAROUBACEAE		SIMAROUBA FAMILY																										
Ailanthus altissima		Tree of heaven													X					X								
SOLANACEAE		POTATO FAMILY																										
Datura wrightii		Jimsonweed					X	X			X		X									X						
Lycium andersonii		Anderson's box thorn														X					X							
Lycium cooperi		Cooper's box thorn											X		X	X				X	X	X						
Solanum sp.		Blue witch								X																		
THEMIDACEAE		BRODIAEA FAMILY																										

BOLD indicates special-status species		PARCEL CODE	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	K-12	K-13	K-14	K-15	K-16	K-17	K-18	K-19	K-20	L-1	L-2	L-3	C-1	C-2	C-4
Taxon	**Synonymy**	**Common name**																										
Dichelostemma capitatum		Blue dicks															X											
TYPHACEAE		CATTAIL TAMILY																										
Typha latifolia		Cattail									X				X													
URTICACEAE		NETTLE FAMILY																										
Urtica dioica ssp. *holosericea*		Stinging nettle	X															X										
VERBENACEAE		VERBENA FAMILY																										
Verbena sp.		Verbena									X																	
VIOLACEAE		VIOLET FAMILY																										
Viola purpurea		Goosefoot violet								X							X											
VISCACEAE		MISTLETOE FAMILY																										
Arceuthobium campylopodum		Pine dwarf mistletoe																X										
Phoradendron bolleanum		Bollean mistletoe																X										
Phoradendron serotinum ssp. *tomentosum*	*Phoradendron villosum*	Oak mistletoe																				X						

Appendix D. Vegetation Maps of the Eastern Kern County Acquisition Parcels



Botanical Survey Alphie Canyon Parcel Group

- Seep/Spring
- Vegetation Alliances and Associations
- Desert wash and mixed scrub
- Pond
- Meadow and Seep
- Rock Outcrop
- Barren
- Developed
- Annual Grassland
- Sensitive Vegetation Type
- Allscale scrub
- Blackbrush scrub
- Big sagebrush scrub
- Blackbrush-creosote bush scrub
- Scalebroom scrub
- California buckwheat scrub
- Cheesebush scrub
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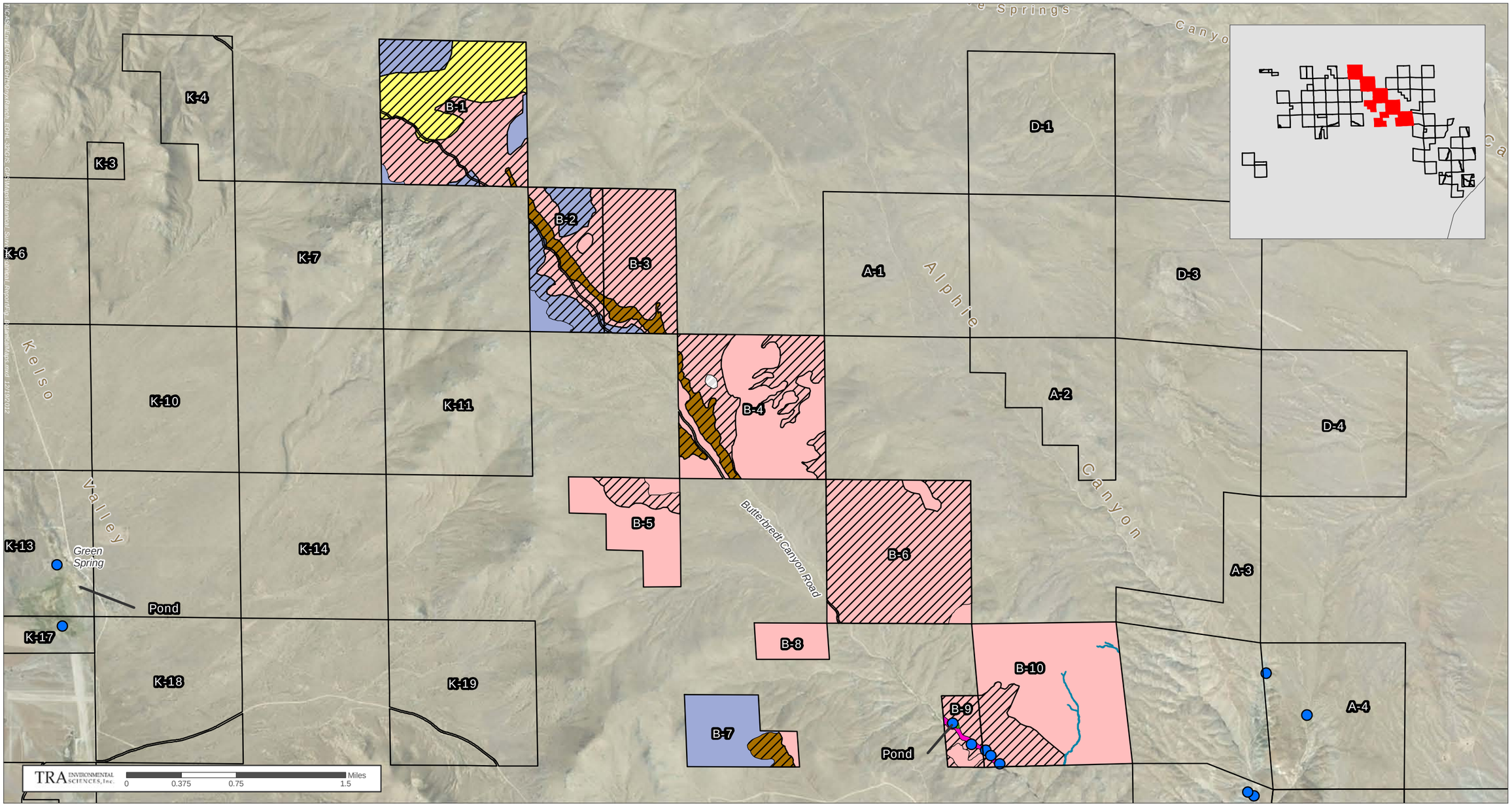

Botanical Survey Butterbredt Parcel Group

- Seep/Spring
- Pond
- Rock Outcrop
- Barren
- Developed
- Meadow and Seep

Vegetation Alliances and Associations

- Desert wash and mixed scrub
- Annual Grassland
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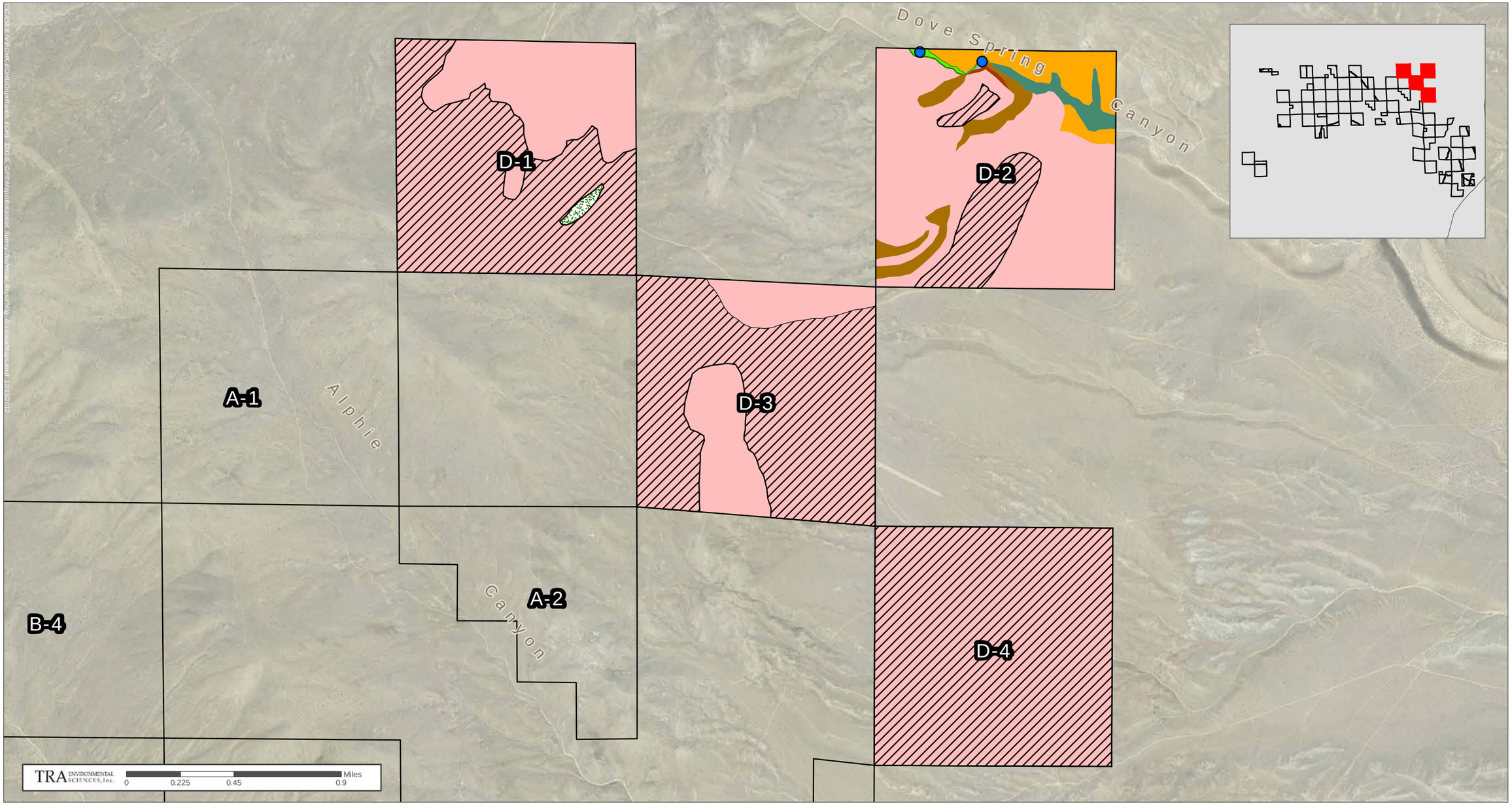

Botanical Survey Dove Spring Parcel Group

- Seep/Spring
- Vegetation Alliances and Associations
- Desert wash and mixed scrub
- Pond
- Meadow and Seep
- Rock Outcrop
- Barren
- Developed
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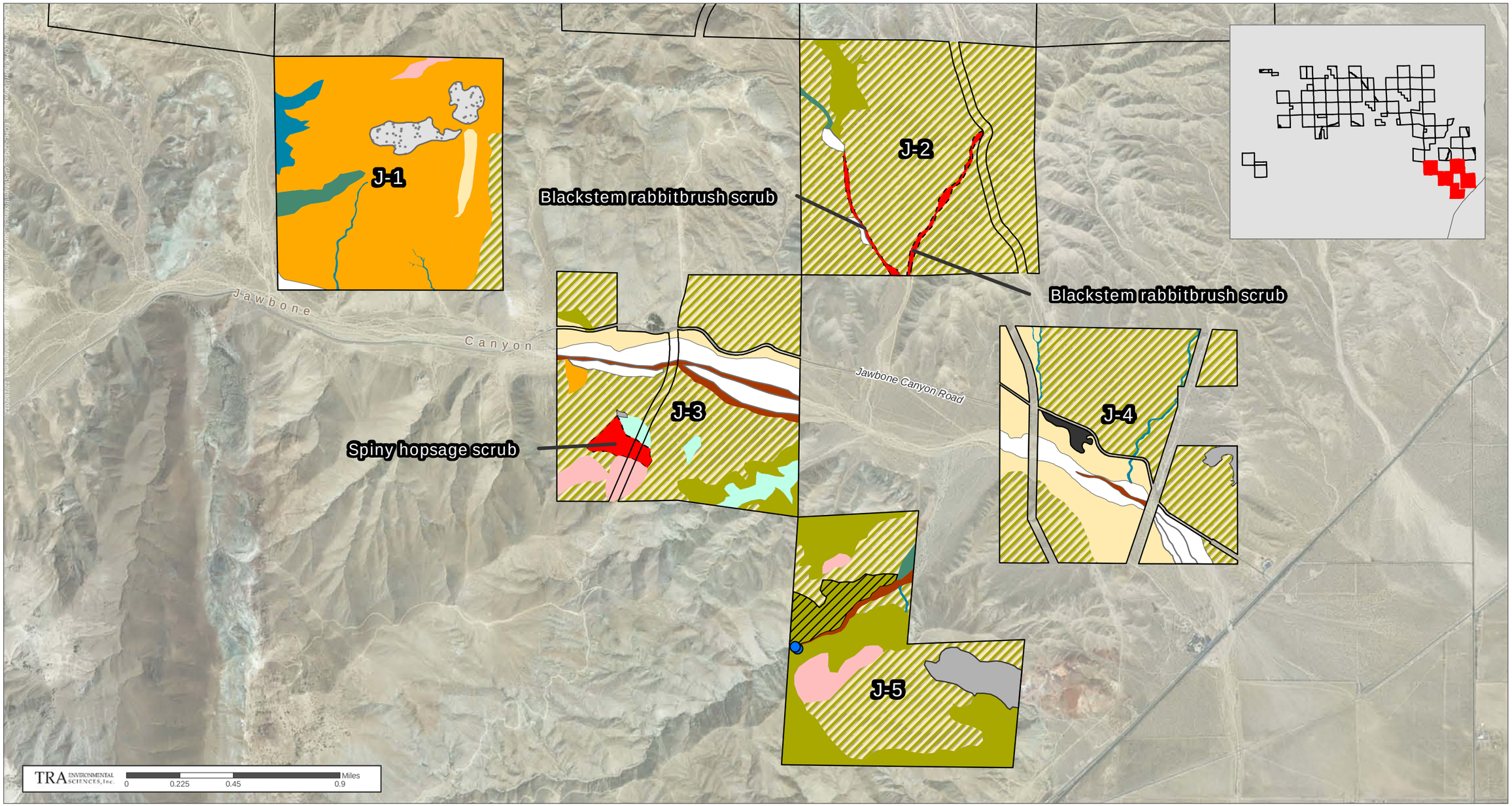

Botanical Survey Jawbone Parcel Group

- Seep/Spring
- Vegetation Alliances and Associations
- Desert wash and mixed scrub
- Pond
- Meadow and Seep
- Rock Outcrop
- Barren
- Developed
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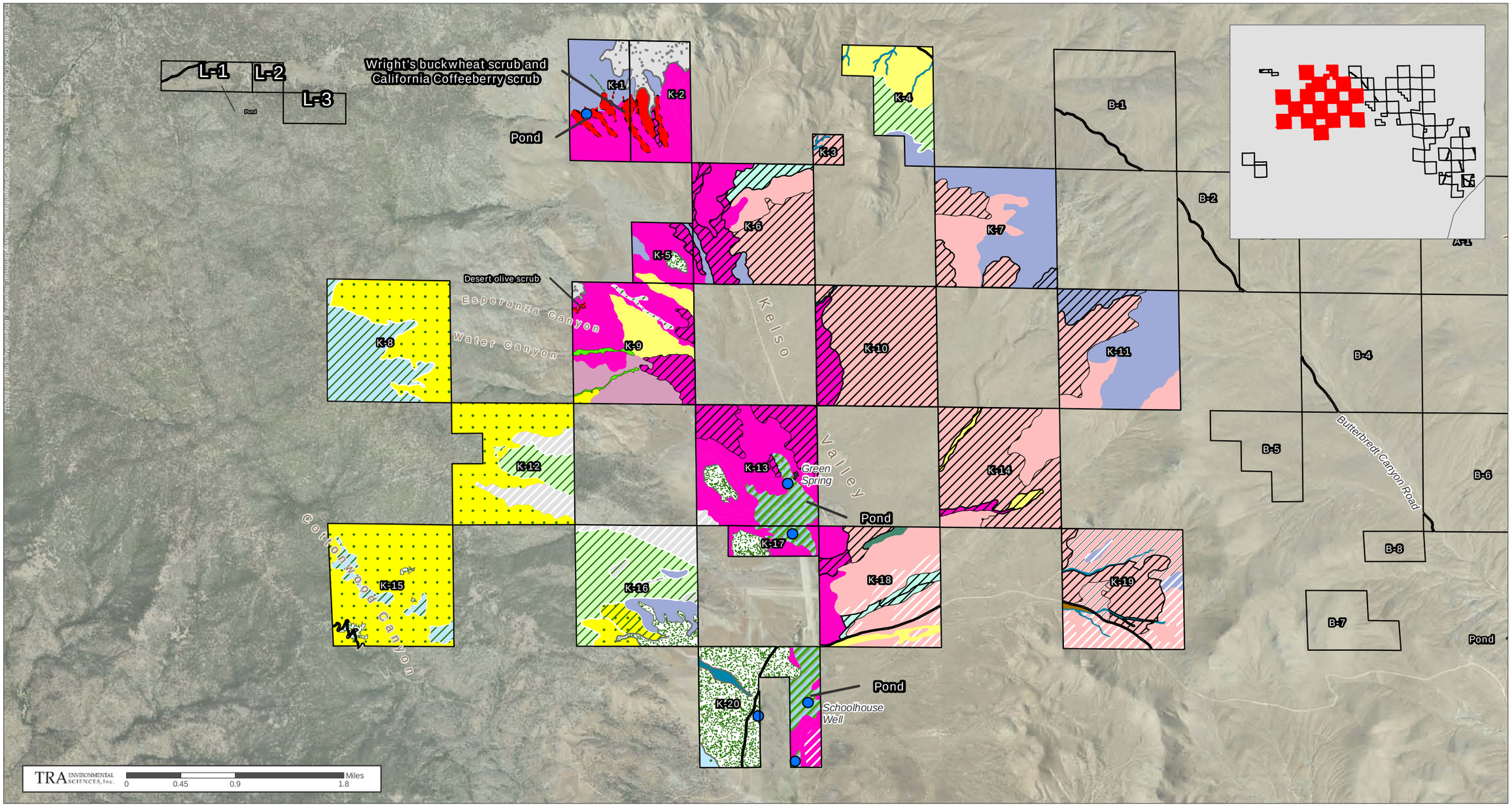

Botanical Survey Kelso Valley Parcel Group

- Seep/Spring
- Pond
- Meadow and Seep
- Rock Outcrop
- Barren
- Developed

Vegetation Alliances and Associations

- Desert wash and mixed scrub
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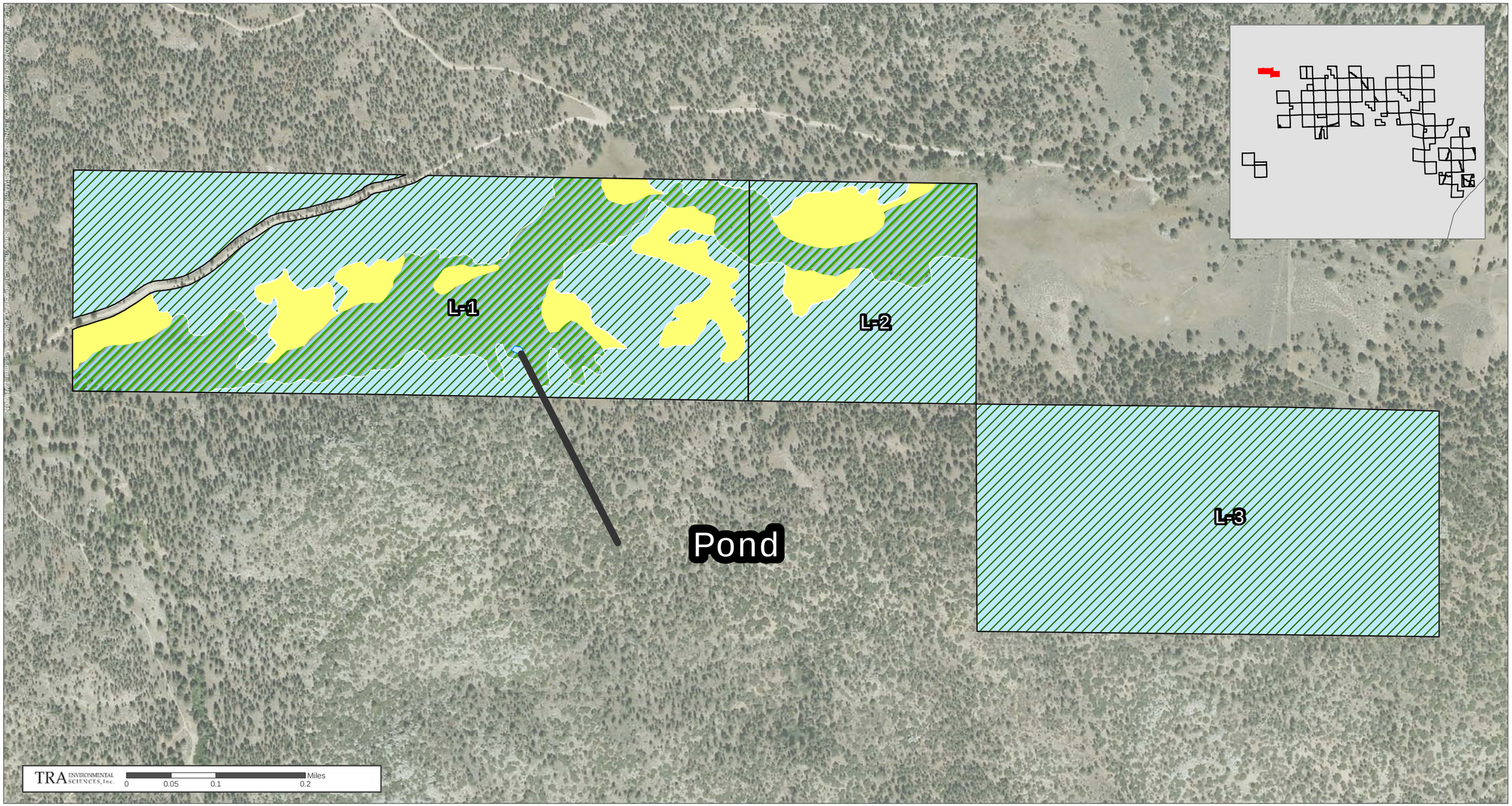

Botanical Survey Landers Meadow Parcel Group

- Seep/Spring
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- Desert wash and mixed scrub
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- Rock Outcrop
- Barren
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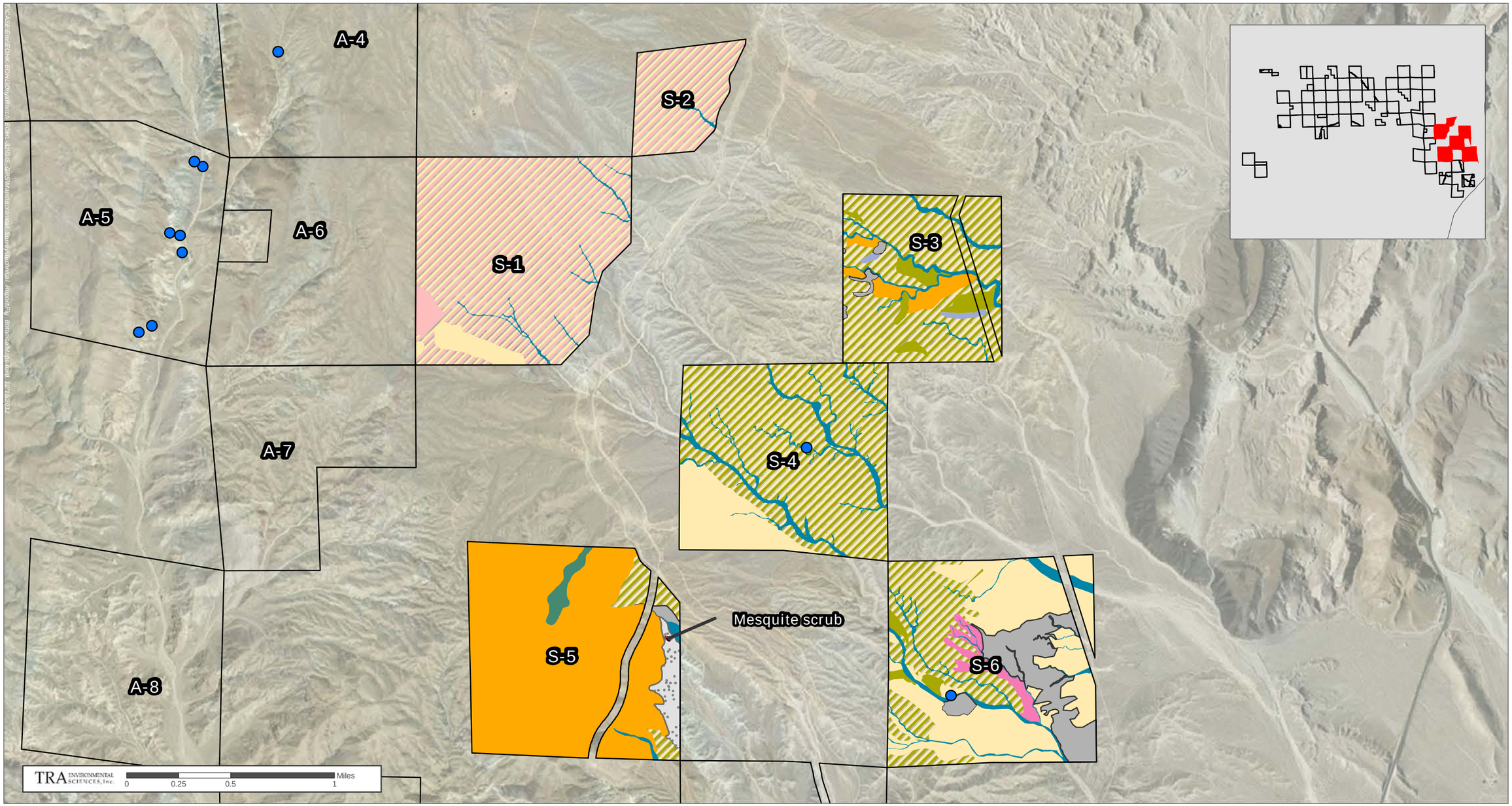

Botanical Survey Sugarloaf Parcel Group

- Seep/Spring
- Vegetation Alliances and Associations
- Desert wash and mixed scrub
- Pond
- Meadow and Seep
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- Barren
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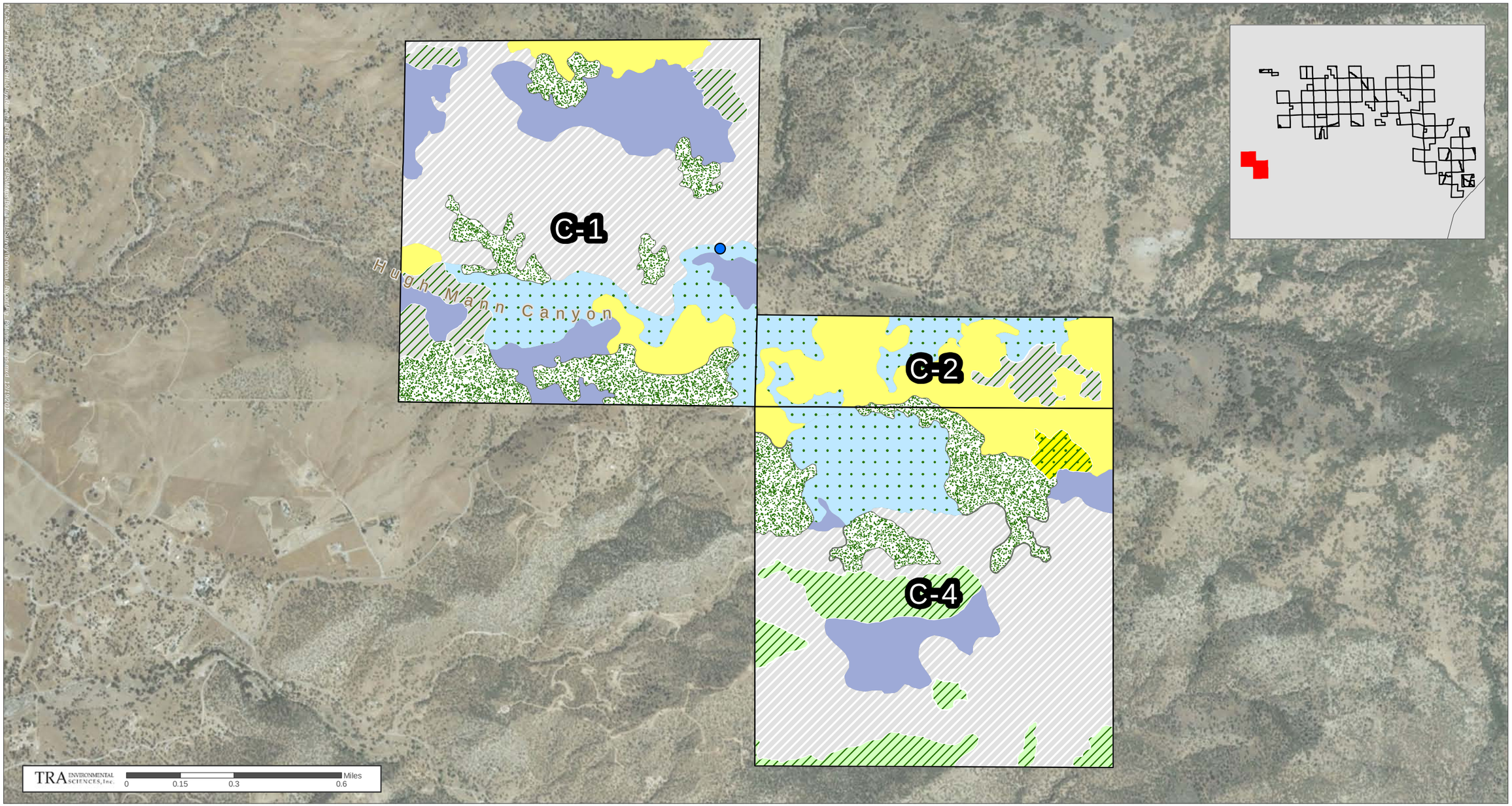

Botanical Survey Caliente Creek Parcel Group

- Seep/Spring
- Vegetation Alliances and Associations
- Desert wash and mixed scrub
- Pond
- Meadow and Seep
- Rock Outcrop
- Barren
- Developed
- Annual Grassland
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California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division

Appendix E. California Natural Diversity Database Field Forms for Eastern Kern County Acquisition Parcels, 2012

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/11/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Castilleja plagiotoma*

Common Name: Mojave paintbrush

Species Found? ☐ Yes ☐ No _____ If not, why?

Total No. Individuals 300 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara M. Leitner and Denise LaBerteaux
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: _____% vegetative 100 % flowering _____% fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Edge of large meadow, just north of Green Spring, Kelso Valley. Just west of Kelso Valley Road and north of ranch headquarters.

County: Kern Landowner / Mgr.: ReNu Resources
Quad Name: Pinyon Mountain 7.5' Elevation: 4100 ft
T 29S R 35E Sec 21, NE ¼ of SE ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T 29S R 35E Sec 21, SE ¼ of NE ¼, Meridian: H☐ M☑ S☐ GPS Make & Model GARMIN 60CSx
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy unk. meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐
Coordinates:

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Castilleja plagiotoma growing under rubber rabbitbrush (Ericameria nauseosa) all along the upper edge of Juncus dominated meadow. Juncus extends upslope somewhat into the Castilleja and Ericameria; other associates include Hesperochiron californicum, Sidalcea, Sisyrhinchium.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances: Although cattle graze meadow, they seem unlikely to affect the Castilleja because it is protected by rabbitbrush.

Threats: Possible threat from OHV usage.

Comments: There appears to be much more suitable habitat around the edge of Green Spring meadow; systematic survey could reveal the presence of more Castilleja plagiotoma.

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☑ By another person (name): Denise LaBerteaux
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

Mail to:
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Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/08/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chamaesyce vallis-mortae*

Common Name: Death Valley sandmat

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 300-400 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara M. Leitner and Mike Wood
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: 50 % vegetative 50 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Northern end of Kelso Valley, base of St. John Ridge, 0.5 to 1 mile west of Kelso Valley Road. On moderately sloping alluvial fans.

County: Kern Landowner / Mgr.: ReNu Resources
Quad Name: Pinyon Mountain 7.5' Elevation: 4500 FT
T 29S R 35E Sec 5, SE ¼ of SW ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T 29s R 35e Sec 5, SW ¼ of SE ¼, Meridian: H☐ M☑ S☐ GPS Make & Model GARMIN 60CSx
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy unk. meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐
Coordinates: 0386475 E 3922756 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants scattered in openings in gravelly sandy soils formed from decomposed granite. Slopes moderate, south-facing. Associates primarily Ericameria nauseosa, Bromus tectorum, also Erodium cicutarium, Loeseliastrum matthewsii, Oenothera californica, Leptosiphon aureus. More populations likely to be found with systematic survey of Kelso Valley.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Cattle grazing

Visible disturbances: Area subject to frequent wildfire

Threats: Possible threat from OHV usage.

Comments:

Determination: *(check one or more, and fill in blanks)*
☑ Keyed (cite reference): Jepson Desert Manual
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

BML 2

Mail to:
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Sacramento, CA 95811
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Date of Field Work (mm/dd/yyyy): 05/10/2012

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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chamaesyce vallis-mortae*

Common Name: Death Valley sandmat

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 300 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara M. Leitner and Denise LaBerteaux
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: 90 % vegetative 10 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

***Location Description* (please attach map *AND/OR* fill out your choice of coordinates, below)**

North end of Butterbredt Canyon Road, 1 mi S of Mayan Peak, 3 mi W of Gold Peak. Plants found in a N-S trending canyion that empties into Butterbredt Canyon in Section 27 to the north of Section 3.

County: Kern Landowner / Mgr.: ReNu Resources

Quad Name: Pinyon Mountain 7.5' Elevation: 4800 FT

T 29S R 35E Sec 3, NW ¼ of NE ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T 28s R 35e Sec 34, NW ¼ of NW ¼, Meridian: H☐ M☑ S☐ GPS Make & Model GARMIN 60CSx

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy unk. meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: 0390646 E 3923796 N; 0390596 E 3923518 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants found in loose sandy soil on the floor and sides of an unvegetated wash surrounded by Artemisia tridentata scrub. Associates include Bromus tectorum, Bromus madritensis rubens, Cryptantha pterocarya, Erodium cicutarium.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Some cattle grazing

Visible disturbances: Some cattle tracks seen.

Threats: Possible threat from OHV usage.

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): Jepson Desert Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital
- Plant / animal ☐ ☐ ☐
- Habitat ☐ ☐ ☐
- Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

BML 3

Mail to:
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Sacramento, CA 95811
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Date of Field Work (mm/dd/yyyy): 05/10/2012

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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chamaesyce vallis-mortae*

Common Name: Death Valley sandmat

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 200 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara M. Leitner and Denise LaBerteaux
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: 90 % vegetative 10 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description **(please attach map AND/OR fill out your choice of coordinates, below)**

Valley floor, Kelso Valley, on open sandy loam on roadsides in the vicinity of Green Spring.

County: Kern Landowner / Mgr.: ReNu Resources
Quad Name: Pinyon Mountain 7.5' Elevation: 4010 FT
T 29S R 35E Sec 21, ___ ¼ of SE ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T 29S R 35E Sec 28, NE ¼ of NE ¼, Meridian: H☐ M☑ S☐ GPS Make & Model GARMIN 60CSx
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy unk. meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐
Coordinates: 0389249 E 3917568 N; 0389081 E 3916854 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants found in open, loose sandy soil on the edges of roads. Surrounding vegetation Ericameria nauseosa scrub with Bromus tectorum, Erodium cicutarium

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Some cattle grazing

Visible disturbances:

Threats: Possible threat from OHV usage.

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): Jepson Desert Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

bmL4

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Date of Field Work (mm/dd/yyyy): 05/10/2012

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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chamaesyce vallis-mortae*

Common Name: Death Valley sandmat

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 200 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara Leitner, M. Wood, D.LaBerteaux
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: 70 % vegetative 30 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

In open unvegetated margin of Butterbredt Canyon Road and in open sandy wash of Butterbredt Canyon for about 0.5 mile downstream from Butterbredt Springs.

County: Kern Landowner / Mgr.: ReNu Resources

Quad Name: Dove Spring 7.5' Elevation: 3800 FT

T 29S R 36E Sec 28, ___ ¼ of SE ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T 29S R 36E Sec 27, SW ¼ of SW ¼, Meridian: H☐ M☑ S☐ GPS Make & Model GARMIN 60CSx

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy unk. meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: 0398493 e 3915865 n; 0398730 E 3915950 N; 0399251 E 3915616 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants found in open, loose sandy soil on the edges of roads and open sandy wash. Adjacent vegetation includes Ericameria nauseosa scrub.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Some cattle grazing

Visible disturbances: Road and OHV activity on Butterbredt Canyon Road maintains open habitat occupied by CHVAMO

Threats: Most of population within fenced Butterbredt Springs is protected from most OHV usage.

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): Jepson Desert Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital
- Plant / animal ☐ ☐ ☐
- Habitat ☐ ☐ ☐
- Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

bML5

Mail to:
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Sacramento, CA 95811
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Date of Field Work (mm/dd/yyyy): 05/08/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chamaesyce vallis-mortae*

Common Name: Death Valley sandmat

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 300 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara Leitner, Mike Wood
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: 80 % vegetative 20 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Wash about 0.5 mile SE of Alphie Springs. Observed population extended for about 0.5 mile along the wash. Plants mostly on low floodplain terrace rather than in active channel.

County: Kern Landowner / Mgr.: ReNu Resources

Quad Name: Cinco 7.5' Elevation: 3200 FT

T 29S R 36E Sec 28, ___ ¼ of SE ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T 29s R 36e Sec 27, SW ¼ of SW ¼, Meridian: H☐ M☑ S☐ GPS Make & Model GARMIN 60CSx

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy unk. meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: 0398493 e 3915865 n; 0398730 E 3915950 N; 0399251 E 3915616 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants found in open, loose sandy soil on the edges of roads and open sandy wash. Adjacent vegetation includes Ericameria nauseosa scrub.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Some cattle grazing

Visible disturbances: Road and OHV activity on Butterbredt Canyon Road maintains open habitat occupied by CHVAMO

Threats: Most of population within fenced Butterbredt Springs is protected from most OHV usage.

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): Jepson Desert Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

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Department of Fish and Game
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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/09/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chamaesyce vallis-mortae*

Common Name: Death Valley sandmat

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 7 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Denise LeBerteaux
Address: 211 Snow St.
Weldon CA 93283
E-mail Address: eremico@aol.com
Phone: (760) 378-3021

Plant Information

Phenology: 50 % vegetative 50 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Southern end of Kelso Valley, broad wash in SW corner of Section 23. About 1 mile E of Kelso Valley Road and 0.5 mile N of Jawbone Canyon Road

County: Kern Landowner / Mgr.: ReNu Resources

Quad Name: Pinyon Mountain 7.5' Elevation: 4100 FT

T 29S R 35E Sec 23, SW ¼ of _____ ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model GARMIN 60CSx

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy unk. meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: 391125 E 3917385 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants scattered in openings broad wash. More populations likely to be found with systematic survey of Kelso Valley.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances:

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): Jepson Desert Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

NK 1

Mail to:
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1807 13th Street, Suite 202
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Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/09/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chamaesyce vallis-mortae*

Common Name: Death Valley sandmat

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 30 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Neal Kramer and Mike Wood
Address: P.O. Box 1582
El Granada CA 94018
E-mail Address: kramerbotanical@yahoo.com
Phone: (650) 563-9943

Plant Information

Phenology: 50 % vegetative 50 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Southern end of Kelso Valley, sandy soil at intersection of Jawbone Canyon Road and Kelso Valley Road. Plants are both in SW corner of Section 27 and NE corner of Section 33

County: Kern Landowner / Mgr.: ReNu Resources

Quad Name: Pinyon Mountain 7.5' Elevation: 3950 FT

T 29S R 35E Sec 27, SW ¼ of SW ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): topo

T 29S R 35E Sec 33, NE ¼ of NE ¼, Meridian: H☐ M☑ S☐ GPS Make & Model _____

DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐

Coordinates:

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants scattered in open sandy soil

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances:

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): Jepson Desert Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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Date of Field Work (mm/dd/yyyy): 05/11/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Calochortus palmeri var. palmeri*

Common Name: Palmer's mariposa-lily

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 3 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara M. Leitner and Denise LaBerteaux
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: _____% vegetative 100 % flowering _____% fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Floodplain terrace of Esperanza Creek, Kelso Valley. Single plant located less than 0.25 mile SE of CNDDB Occ. 66. May be an outlier from this population, as the site is fairly dry compared with the larger colony at Occ. 66.

County: Kern Landowner / Mgr.: ReNu Resources

Quad Name: Claraville Elevation: 4460 FT

T 29S R 35E Sec 17, NW ¼ of NW ¼, Meridian: H☐ M☑ S☐

T____ R____ Sec____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): GPS

GPS Make & Model GARMIN 60CSx

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐

Horizontal Accuracy unk. meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: 0386194/3920126

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Relatively dry floodplain terrace, gravelly, north side of Esperanza Creek.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☐ Fair ☑ Poor

Immediate AND surrounding land use: Very small size of population is reason for low quality/viability.

Visible disturbances: None noted. This is an area apparently subject to frequent wildfire

Threats: Possible threat from OHV usage.

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): Jepson Manual 2012
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/11/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Forestiera pubescens Patch*

Common Name: Desert Olive Patch

Species Found? ☐ Yes ☐ No _____ If not, why?

Total No. Individuals n/a Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Barbara M. Leitner and Denise LaBerteaux
Address: 2 Parkway Court
Orinda, CA 94563
E-mail Address: bleitner@pacbell.net
Phone: (925) 253-8300

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

***Location Description* (please attach map AND/OR fill out your choice of coordinates, below)**

Lower portion of Esperanza Creek on alluvial fan as it empties into Kelso Valley.

County: Kern Landowner / Mgr.: ReNu Resources
Quad Name: Claraville Elevation: 4460 FT
T 29S R 35E Sec 17, NW ¼ of NW ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model GARMIN 60CSx
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy unk. meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐
Coordinates: 0386194/3920126 (approximate)

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Esperanza Creek, below forest belt, as creek disappears into alluvial fan. Nearby is a Calochortus palmeri var. palmeri record. Surrounding vegetation is Ericameria nauseosa scrub.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Large and dense stand of desert olive along streambanks.

Visible disturbances: None noted. This is an area apparently subject to frequent wildfire

Threats: Possible threat from OHV usage.

Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

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Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 04/06/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Phacelia nashiana*

Common Name: Charlotte's phacelia

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 6 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Neal Kramer
Address: P.O. Box 1582
El Granada, CA
E-mail Address: kramerbotanical@yahoo.com
Phone: (650) 563-9943

Plant Information

Phenology: 80 % vegetative 20 % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Steep slope just to the east of Alphie Springs Road in the NE corner of the section. Population was on the upper portion of the slope perhaps 200 feet above the canyon floor. A large tributary canyon to Alphie Canyon (benchmark 3218 ft at the mouth) is just to the south.

County: Kern Landowner / Mgr.: ReNu Resources

Quad Name: Cinco 7/5' Elevation: 3480 ft

T 29S R 36E Sec 35, NE ¼ of NE ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model GARMIN 60CSx

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: 0401892 E 3915050 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Steep west-facing slope, loose decomposed granite gravel, very sparse vegetation where PHNA was observed. Associates include Leptosyne bigelovii, Salvia columbariae, Erodium cicutarium, Phacelia distans, Lupinus excubitus, Eriogonum nudum var. westonii. Eriogonum fasciculatum var. polifolium. Site was revisited in May 2012 and plants were not detectable.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances: None noted

Threats: OHV use in canyon unlikely to impact this rather inaccessible population

Comments: More plants might be detectable in a higher-rainfall year.

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/08/2012

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

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Scientific Name: *Sclerocactus polyancistrus*

Common Name: Mojave fish hook cactus

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Neal Kramer
Address: P.O. Box 1582
El Granada, CA
E-mail Address: kramerbotanical@yahoo.com
Phone: (650) 563-9943

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Rocky ridge west of Alphie Springs Road in the western half of the section.

County: Kern Landowner / Mgr.: ReNu Resources
Quad Name: Cinco 7/5' Elevation: 3262 ft
T 29S R 36E Sec 35, NW ¼ of ____ ¼, Meridian: H☐ M☑ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model GARMIN 60CSx
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐
Coordinates: 0401672 E 3913901 N

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Rocky ridge top with Larrea tridentata, Ambrosia dumosa, Ericameria cooperi, Coleogyne ramosissima. Xylorhiza tortifolia, Eriogonum inflatum.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances: None noted

Threats: OHV use in canyon unlikely to impact this rather inaccessible population

Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): Jepson desert manual
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

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APPENDIX F

DESERT TORTOISE SURVEY OF [RENU] RESOURCES PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA

Leatherman Bioconsulting, Inc.

DESERT TORTOISE SURVEY OF RENEWABLE RESOURCES* PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA 2012

LEATHERMAN BIOCONSULTING, INC.

AUGUST 2012

*Note: The landowner of record is ReNu Resources, LLC.

For purposes of this report, Renewable Resources Group = ReNu Resources, LLC.

DESERT TORTOISE SURVEY OF RENEWABLE RESOURCES PROPERTY ACQUISITION PROJECT, KERN COUNTY, CA 2012

Prepared for:

TRA ENVIRONMENTAL SCIENCES, INC.
545 Middlefield Road, Suite 200
Menlo Park, California 94025

Prepared by:

LEATHERMAN BIOCONSULTING, INC.
4848 Lakeview Avenue, Suite 100E
Yorba Linda, California 92886
(714) 701-0863

AUGUST 2012

EXECUTIVE SUMMARY

The California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division (CDPR), is proposing to acquire 60 privately-owned parcels known as Onyx Ranch from Renewable Resources Group (RRG). TRA Environmental Sciences, Inc. is preparing an Environmental Impact Report for the acquisition project. A survey to evaluate the presence and distribution of the desert tortoise on selected parcels was conducted by Leatherman BioConsulting, Inc. to provide data for the EIR.

The RRG Onyx Ranch property covers approximately 25, 800 acres (44.5 square miles) of land within the western range limits of the desert tortoise. Desert tortoises are known from the general region, but their presence and distribution in the Onyx Ranch area is poorly understood because site specific locality data are lacking. Therefore, a preliminary survey to better define the distribution of the desert tortoise in the region was conducted.

Fifteen parcels totaling approximately 13 square miles were sampled for desert tortoise by walking 149 miles of transects within the parcels, representing approximately 7.1% of the Study Area. The surveys were conducted during the known spring activity period of the desert tortoise between April 30 and May 15, 2012. Presence of the desert tortoise was established on 11 of the 15 parcels surveyed. All size classes (juvenile, young adult, adult) of desert tortoise were observed indicating recent recruitment and long term survivorship, at least in some areas.

One desert tortoise was observed within the Jawbone Canyon OHV Open Area, representing the only recent sign detected within that area (other sign observed did not indicate recent use). Most of the desert tortoise sign was detected in the eastern parcels north of the Jawbone Canyon OHV Open Area where there was good habitat and the rugged topography (badlands) limited OHV access. Areas dominated by blackbush scrub were usually devoid of desert tortoise sign, although tortoises were observed in adjacent canyons where Mojave mixed woody scrub and/or creosote bush was dominant.

Fencing currently limits OHV use on some of the parcels. If the fencing is not maintained then OHV may increase in those parcels. Desert tortoises occurring in these areas would be subjected to impacts associated with OHV use.

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1.0 INTRODUCTION

Project Description

This report summarizes the results of surveys for the desert tortoise (*Gopherus agassizii*) at the eastern end of Onyx Ranch in northeastern Kern County, California. The California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division (CDPR), is proposing to acquire the 60 privately-owned parcels (approximately 28,500 acres, or 44.5 square miles) from Renewable Resources Group (RRG). The RRG parcels, which historically were known as Onyx Ranch, are located west of State Route 14 (west of Red Rock State Park) and north of the City of Mojave (Figure 1). The majority of the RRG acreage to be purchased is located within the Jawbone-Butterbredt Area of Critical Environmental Concern (ACEC). Elevation ranges from approximately 2,170 feet above mean sea level in Jawbone Canyon along the edge of the Mojave Desert at the eastern boundary of the site to approximately 7,700 feet on Sorrell Peak in the Piute Mountains near the western boundary of the site. TRA Environmental Sciences, Inc. is preparing an Environmental Impact Report for the acquisition project.

The RRG parcels are interspersed with lands owned by the U.S. Bureau of Land Management (BLM). The checkerboard pattern of ownership between public and private lands is the result of land grants of alternating sections issued during the railroad era.
Off-highway vehicle (OHV) recreation occurs on many of the RRG and BLM parcels, mostly on designated roads and trails. However, some of the RRG parcels are within the Jawbone Canyon OHV Open Area and adjacent to the Dove Springs OHV Open Area where travel is not restricted. The BLM thus faces the challenge of managing lands that are not contiguous yet include the need to provide for public access by working cooperatively with private landowners. Although the main access roads allow passage through many of the RRG parcels, many of the washes, canyons, and smaller dirt roads leading onto the RRG parcels have been fenced off to prevent OHV use in those areas. Land use throughout the area (including BLM and RRG parcels) is designated as open range.

The RRG parcels are located along the western range limits of the desert tortoise, a species listed as threatened under the federal Endangered Species Act (USFWS 1990). Most of the western and northern parcels are either too high in elevation to support desert tortoises or do not support suitable habitat. In addition, many of the parcels consist of extremely steep and rocky terrain where conducting surveys is not practical. Based on these and other considerations identified below, and following discussions with the U.S. Fish and Wildlife Service and California Department of Fish and Game, desert tortoise surveys were modified from the current U.S. Fish and Wildlife Service desert tortoise protocol (USFWS 2010). In essence, 10 miles of transects were conducted on fifteen parcels that were dominated by creosote bush scrub or supported suitable Mojave mixed woody scrub habitats within the elevation limits of the desert tortoise. These fifteen parcels are hereinafter referred to as the Study Area.

Existing Conditions

Onyx Ranch lands consist largely of undeveloped sections or partial sections with an extensive system of dirt roads and trails throughout. These roads allow public access through the private parcels to surrounding lands managed by the BLM for OHV recreation and camping. Jawbone Canyon Road is a paved road that crosses through the southernmost parcels in an east to west direction. Several dirt roads traverse the parcels including Gold Canyon Road, maintenance roads along the two Los Angeles Aqueduct pipelines, power line roads, private roads, and numerous OHV trails. Trails are so numerous in the Jawbone Canyon OHV Open Area that large areas are completely denuded of vegetation, especially adjacent to camping areas. Several roads on the RRG parcels have been fenced off and closed to OHV use, some of which are undergoing restoration at their intersection.

The topography of RRG parcels in the Study Area varies widely. Most exhibit extremely rugged terrain that includes highly incised badlands with multiple ridges and drainages, steep mountain slopes, and large canyons with extensive wash systems. The northern parcels exhibit more moderately sloped terrain composed of rolling hills and alluvial plains. Soils range from decomposed granite on the slopes, gravel-laden alluvium in flatter areas, and large rock outcrops along the ridges and steeper slopes. Larger wash systems are composed primarily of sands and loams that provide excellent substrates for desert tortoise burrows along the margins. Nearly all the parcels have different topography and noticeably different geological features: uniform habitat and topography over extensive areas is lacking.

The vegetation communities on the RRG parcels transition with the elevation gradient. The eastern parcels occur at lower elevations along the western edge of the Mojave Desert floor. These parcels are dominated by creosote bush scrub and represent the highest quality habitat for the desert tortoise in the Study Area. Mid-elevation parcels to the west support Mojave mixed woody scrub, and parcels to the north are dominated blackbush scrub with scattered Joshua trees. Higher elevations at the western end of the property give way to pinyon-juniper woodland habitat, which are not included in the Study Area.

The quality of the habitat for the desert tortoise varies based on the dominant vegetation types and human-related disturbances including OHV use, utility corridors, and cattle grazing. Sections within the Jawbone Canyon OHV Open Area were denuded of vegetation because of OHV use and expansive camps, although intact habitat remains in inaccessible canyons and rock outcrops. Other sections were lightly to heavily impacted by cattle grazing where the severity of the impact was usually highest along low gradient washes and flat areas easily traversed by cattle. Impacts associated with cattle grazing that reduce habitat quality for desert tortoise include vegetation loss and trampling, disturbance of soil surfaces, increased erosion potential and soil compaction.

2.0 METHODOLOGY

Literature Review

A review of pertinent literature was conducted prior to the field work to identify known occurrences of the desert tortoise in the region. The California Department of Fish and Game's Natural Diversity Data Base (CDFG 2012) was searched for desert tortoise occurrence records within the Study Area and surrounding region. Desert tortoise survey reports by Phoenix Ecological Consulting (2010), Keith et. al (2008), and EDAW (2004) were also reviewed. The database records were searched by U.S. Geological Survey 7.5' series topographic maps for the Dove Springs and Cinco quadrangles, which include the RRG parcels, and the Horse Canyon, Pinyon Mountain, Cross Mountain, Emerald Mountain, Cache Peak, and Mojave NE quadrangles that occur to the north, west, and south. Additional references and in-house files were used to compile information on vegetation communities and other relevant biological resources.

Survey Method Rationale

Prior to conducting desert tortoise surveys, TRA Environmental Sciences, Inc. (TRA) contacted the California Department of Fish and Game and the U.S. Fish and Wildlife Service to describe the location, size and complexity of the project and determine the level of effort for conducting desert tortoise surveys. Factors considered in evaluating what level of effort was acceptable included the following. Conducting protocol level surveys on all 60 parcels would not be necessary because the westernmost parcels are clearly beyond the known western range of the desert tortoise and above known elevation limits. The steep, rugged and (in some cases) mountainous terrain on some parcels would severely limit access and present safety hazards for biologists conducting the surveys. Because the project site is not contiguous, includes several habitat types, spans many miles and a wide elevation gradient, and was expected to have very few tortoises (if any in the parcels in the Open Areas), the current 2010 protocol may not be well suited to estimating the number of tortoises. Finally, no changes to the management of the parcels are planned, and no impacts associated with the acquisition to the tortoise are anticipated at this time.

The purpose of the 2010 desert tortoise protocol is to 1) determine presence or absence of the desert tortoise within a project area, 2) to allow an estimate of the number of tortoises, and 3) assess the distribution of the tortoises within the project area. Based on the above considerations, surveys were conducted on fifteen parcels with an emphasis on determining presence, which also provided information on the distribution of the tortoise within the Study Area. The proposed survey methodology does not allow an estimate of the number of desert tortoises using the formula in the protocol; however, a crude measure of the relative abundance of the desert tortoise within the Study Area can be made because the same level of sampling effort was made in each section.

Survey Methods

The parcels of land to be surveyed were tentatively identified based on vegetation maps depicting the distribution of creosote bush scrub in the region (West Mojave Plan 2006), but were adjusted in the field based on topography and habitat. Fifteen parcels of land were

ultimately included in the survey effort as part of the Study Area. All fifteen parcels were located at the eastern end of the acquisition area below 4,500 feet elevation and supported at least some creosote bush scrub habitat.

Desert tortoise surveys were conducted between April 30 and May 15. Surveys were conducted by Brian Leatherman and James Huelsman, both of whom have extensive experience (30 years combined) conducting desert tortoise surveys, desert tortoise monitoring and handling, and assisting with translocation studies and radio telemetry. Approximately 10 miles of transects were conducted per section of land surveyed. Transects were conducted by the biologists walking parallel belt transects within sight or radio communication of each other at distances that varied depending on terrain. On parcels that were relatively flat or had navigable terrain throughout, transects were evenly spaced throughout the entire parcel. On parcels with mountains and cliffs, or other topographical features that were not (safely) navigable, meandering transects were walked across accessible terrain covering as much of the section as possible. The length of each transect was documented and recorded using the trip odometer and track log features of the GPS unit carried by each biologist.

General notes on vegetation type, substrate, topography, and human-related disturbances were recorded during the surveys. All diagnostic sign of desert tortoise (e. g., live tortoises, carcasses, scat, burrows, tracks, eggshell fragments, pallets, drinking depressions, courtship rings) was recorded in field notes and as waypoints using GSP technology for mapping purposes. A mirror was used to reflect sunlight into potential burrows to determine if tortoises were present or look for signs of recent use. No tortoises were handled or marked. Weather conditions were recorded at the beginning and end of each transect, usually at least four times per day. Air temperatures were taken and recorded to ensure surveys were within the limits for active desert tortoises identified in the survey protocol (USFWS 2010).

The boundaries of all the parcels surveyed were uploaded onto GPS units after converting .kml files (Google Earth software) into GPS-compatible .gpx files. As such, biologists conducting the surveys were able to continuously monitor their location within the section. The parcels were surveyed in a random order.

All vertebrate wildlife species observed or detected during the surveys were recorded in field notes. A complete list is presented in Appendix A. Taxonomy and nomenclature follow Stebbins (2003) for reptiles, AOU (1998) for birds, and Jones et. al (1992) for mammals.

3.0 RESULTS

Literature Search

Six occurrences for desert tortoise were reported in the California Natural Diversity Data Base for the seven quadrangles searched (CDFG 2012). The parcels surveyed for desert tortoise are located on the Dove Springs and the Cinco quadrangles (the Cinco quadrangle is south of the Dove Springs quadrangle), on which no occurrences of individual tortoises are

reported. However, the Cinco quadrangle is included in a list of quadrangle maps that support the Freemont-Stoddard desert tortoise population that inhabits a 1,700 square mile area of the western Mojave Desert.

No occurrences of desert tortoise were reported on the quadrangles located to the west (Pinyon Mountain, Cross Mountain) or to the north (Horse Canyon) of the Study Area. Four desert tortoise occurrence records were found on the Mojave NE quadrangle (south of the Study Area) including three individual records and the same general record noted above that includes the Freemont-Stoddard population. Two desert tortoise occurrence records were also found on the Cache Peak quadrangle (southwest of the Study Area). Both of these quadrangles include habitat on the Mojave Desert valley floor.

Phoenix Ecological Consulting (2010) conducted presence/absence surveys for the desert tortoise on the North Sky River Wind Resource project site including transects along Jawbone Canyon Road and Gold Canyon Road. Their surveys along Gold Canyon Road partially overlapped the westernmost parcel surveyed for this report (APN 444-070-09), where they documented one tortoise, five burrows, four scat and one carcass. Additional sign was found west of the Study Area, including a tortoise located two miles west of APN 444-090-04 on a slope above Jawbone Canyon.

Keith and Berry (2008) reported no desert tortoise sign on the 31 plots (1 hectare each) they surveyed in their South Dove Springs study area. The South Dove Springs study area is adjacent to and south of parcel APN 153-130-03 surveyed for this report, and encompasses APN 153-150-04, which was not surveyed. Keith and Berry (2008) did document tortoise sign (including one live tortoise) on 10 of 37 plots surveyed in their Red Rock study area, which overlaps and encompasses three of the easternmost sections of land surveyed for this report (APNs 153-240-16, 181-020-13, and 181-080-30). The locations of the Phoenix Ecological Consulting (2010) and Keith et. al (2008) survey areas relative to the Study Area are shown in Figure 2.

EDAW (2004) reported a live tortoise along the paved portion of Jawbone Canyon Road near crossing of the second Los Angeles Aqueduct. This location is within APN 181-080-11 where we documented a relatively recent carcass and a potential burrow.

Desert Tortoise Survey

Fifteen discrete parcels of land ranging in size from a complete section of 640 acres (1 sq. mi.) to a partial section of 127 acres were surveyed for desert tortoise. The combined area surveyed was 8,301 acres, or the equivalent of 13 square miles. A total of 149 miles of transects was walked for an average transect length of 11.5 miles per square mile. As such, approximately 7.1% of the area in the fifteen parcels was surveyed. Thirteen parcels were large enough (close to 1 sq. mi.) that 10 miles of transects were completed within them. Two parcels were much smaller so 10 miles of transects were split between the two.

Desert tortoises or sign indicating their presence were observed on 11 of the 15 parcels of land surveyed. The locations of desert tortoises and desert tortoise sign found on each parcel are shown in Figure 3. Because of the relatively small sample size (7.1% of the area), negative results do not necessarily indicate absence of the desert tortoise (e.g. sign may have been missed on some sections because of the large area that was not surveyed). A summary of the transect data and desert tortoise sign associated with each of parcels surveyed is presented in Table 1.

Table 1. Parcel, Transect, and Desert Tortoise Sign Data

TRA Section No.	APN No.	APN Acreage	Transect Length	Type of Sign Observed*	No. of Sign Observed
58	153-130-03	640	10.16	-	-
70	153-170-03	640	10.26	B, S	4
77	153-170-04	600	11.13	T, B, S, C	7
78	153-240-14	127	3.81	-	-
79	153-240-12	617	10.66	-	-
80	153-240-16	327	7.10	T, B, S, C	9
81	181-020-02	612	10.69	T, B. S, C	12
82	181-020-11	613	10.13	-	-
83	181-020-13	622	10.98	B, S	12
84	181-080-32	614	11.57	T, S, B, C	3
85	181-080-11	582	10.70	B, C	2
86	181-080-30	550	10.56	T, B	2
157	444-070-05	477	10.20	T, B, S, C	6
164	444-070-09	640	10.23	B, S, C	4
166	444-090-04	640	10.82	B	3
		8301	149.00		

* B = Burrow, C = Carcass, S = Scat, T = Tortoise

A total of 13 tortoises was observed during the surveys, representing 10 individuals. One tortoise was observed on two different transects, once on May 8 (Record No. T-77-1) and once on May 9 in the adjacent parcel (Record No. T-157-01). Another tortoise was observed incidentally on May 7 (Record No. T -81-2) while driving through APN 181-020-02, and then during transects on that same parcel on May 10. A third tortoise was observed in a burrow at the beginning of a transect, and observed out of the burrow at the end of the transect (Record Nos. T/B 81-1 and T-81-1).

All size classes of desert tortoise were observed indicating recent recruitment and long term survivorship (at least for some individuals). Sizes ranged from a juvenile tortoise with an estimated MCL of 60mm that likely hatched the previous fall (Record No. T-80-3), young

adult tortoises of intermediate size that appeared in excellent health (Record Nos. T-86-1 and T-81-2), and aged tortoises with sunken and well-worn scutes on the carapace (Record No. T-77-1).

One large male tortoise was observed incidentally approximately 0.6 mile north of APN 153-240-16 northwest of the boundary of Red Rock State Park. It was found turned over on its carapace near the edge of a wash (Record No. T-INC-1). The tortoise had voided the contents of its bladder all over its plastron, either in panic or perhaps to maintain body temperature through evaporative cooling. Depressions from the carapace in the sand and claw marks clearly indicated that the tortoise had been upside down for an extended period of time and had expended substantial energy to right itself: our interpretation was that the tortoise was in mortal danger from exposure, so we righted and attempted to rehydrate the tortoise. No evidence was found to indicate that this male had been flipped by another male during a territorial battle. It appears that the tortoise likely fell off the adjacent wash terrace as it attempted to access the wash down the steep decline.

The following desert tortoise sign was observed in addition to the live tortoises that were found. Thirteen scats were observed on seven different sections. Very old scat on some parcels where no recent sign was detected indicated past presence. Other sections had fresh scat indicating it was deposited this year even though no tortoises were observed. Ten carcasses were observed on seven different sections. Some of the carcasses were completely disarticulated bone fragments. Others were intact shells with some or all of the scutes adhering to the bone. In the OHV open area, the carcass of one young tortoise was observed (Record No. C-85-1). The tortoise's demise was relatively recent with the scutes exhibiting normal color and tightly adhering to the bone. Only the back half of carapace remained suggesting the front half was smashed by a vehicle (likely an OHV given its distance from the paved Jawbone Canyon Road); the estimated MCL was 175mm. Thirty-two burrows were observed. Of those, 19 were judged to be definitely tortoise (in varying states of quality) and the remainder were possibly tortoise. Two burrows were occupied by a desert tortoise. A table listing all desert tortoise sign observed during the surveys is included in Appendix B.

In addition to the surveys reported here, focused studies for special status birds and rare plants were conducted by TRA in 2012, and focused surveys for the Mohave ground squirrel (*Xerospermophilus mohavensis*) and other special status vertebrates was conducted by Biosearch Associates (2012). One record of interest was the detection of one desert tortoise scat in the southwest corner of APN 153-150-04, which was not included in the Study Area.

4.0 DISCUSSION

The RRG Onyx Ranch property covers approximately 28,500 acres of land within the western range limits of the desert tortoise. Although desert tortoises are known from the general region, the extent to which desert tortoises occupy the area is poorly understood because site specific locality data are lacking. Therefore, a preliminary survey to better define the distribution of the desert tortoise in the region was conducted. Fifteen parcels

totaling approximately 13 square miles were sampled for desert tortoise by walking 149 miles of transects within the parcels. Although the survey did not follow the current USFWS survey protocol (USFWS 2010), and represented a relatively small percentage of the Study Area (7.1%), presence of the desert tortoise was established on 11 of the 15 parcels surveyed and the associated data can be used to direct subsequent survey efforts as necessary.

The following patterns emerge from the limited data. Of the 11 parcels where desert tortoise sign was observed, the four parcels within the Jawbone Canyon OHV Open Area had the least amount of sign. Desert tortoise sign was concentrated in canyons and badlands where OHV use was inhibited by fencing or limited because of rugged terrain. Areas dominated by blackbush scrub generally lacked desert tortoise sign.

Five RRG parcels are entirely or partially within the Jawbone Canyon OHV Open Area. Parcel APN 181-190-02, the southernmost parcel, was not surveyed because of the mountainous terrain and lack of access. Desert tortoise sign was documented in each of the other four parcels. APN 181-080-30 is entirely within the Open Area and had two sign, including a healthy young adult (MCL ~ 210mm) at the northern boundary of the parcel. This tortoise (Record No. T-86-1) represents the only sign of recent tortoise use within the Open Area. APN 181-080-11 is also entirely within the Open Area. One desert tortoise carcass and one burrow (possibly but not definitely tortoise) were observed within the wash area of the parcel. Neither of these indicates recent presence of tortoise: even though the carcass was relatively recent, it may have been carried to its current location by a scavenging predator. Three tortoise burrows (one possibly tortoise and two definitely tortoise) were observed within parcel APN 444-090-04. The two that are definitely tortoise were in a deteriorated condition, suggesting they have not been used recently. All three burrows were located in the southeast corner of the parcel in a canyon where OHV use was limited because of rugged terrain. Lastly, a carcass, scat and tortoise in a burrow were observed in parcel APN 181-080-32. All three of these sign locations were well north of the Open Area where travel was restricted to existing dirt roads.

The most sign were observed on APNs 181-020-02 (12 sign), 181-020-13 (12 sign), and 153-240-16 (9 sign). This can be at least partially explained by their location at the eastern end of the Study Area where the parcels are dominated by creosote bush scrub (and represents the best habitat within the Study Area) and are closest to source populations located to the east in Red Rock State Park and the Mojave Desert valley floor. However, the badlands covering the majority of these parcels limit the use of the area by OHV enthusiasts. The next two highest ranking parcels were APN 153-170-04 (with 7 sign) and 444-070-05 (with 6 sign). All of the sign on these two parcels were located in rugged canyons where fencing inhibited access by OHV users.

Habitat dominated by blackbush scrub was usually negative for desert tortoise and their sign. No sign was observed on APN 153-130-03, the northernmost parcel, which was entirely dominated by blackbush scrub. Similarly, no sign was detected in the Dove Springs study area surveyed by Keith and Berry (2008) where blackbush scrub is dominant. Although

desert tortoise sign was observed on APN 153-170-03 and 153-170-04 in the canyons on the western half of the parcels, the vegetation in those areas consisted of Mojave mixed woody scrub. No desert tortoise sign was detected on the eastern half of those parcels where blackbush scrub dominated (with the exception of one very old scat observed in the transition zone between the vegetation communities). No sign was observed on APN 153-240-14 or 153-240-12 where blackbush scrub with scattered creosote bush occurs throughout the parcels. However, given the proximity of these parcels to parcels APN 181-020-02 and 153-240-16, which had a high number of sign, we expect that sign would be found on those parcels given a larger survey sample. One exception to this general pattern was a single scat observed by Biosearch Associates (2012) in blackbush scrub in the southwest corner of APN 153-150-04.

Evaluating impacts associated with a project that involves the transfer of land from one entity to another with no planned changes in land management is limited. Current land use on the northern parcels where fencing along access roads and washes inhibits OHV use appears to benefit individual tortoises and contribute to their persistence in those areas. Southern parcels within the Open Area are exposed to high levels of uninhibited OHV use that results in extensive areas with disturbed vegetation that lowers habitat quality for the desert tortoise or results in direct mortality. These conditions would not change as a result of the project. However, if cattle are no longer raised on the RRG parcels after the acquisition, impacts associated with cattle grazing would not occur resulting in a net benefit to the habitat and desert tortoise. Alternatively, lack of maintenance of the fencing that inhibits access to some parcels would eventually lead to gaps that would allow OHV access to areas that were previously inaccessible. Desert tortoises occurring in these areas would be subjected to detrimental impacts associated with OHV use, including road kill. Obviously, opening of the RRG parcels to widespread OHV use by CDPR in the future would have the same effect.

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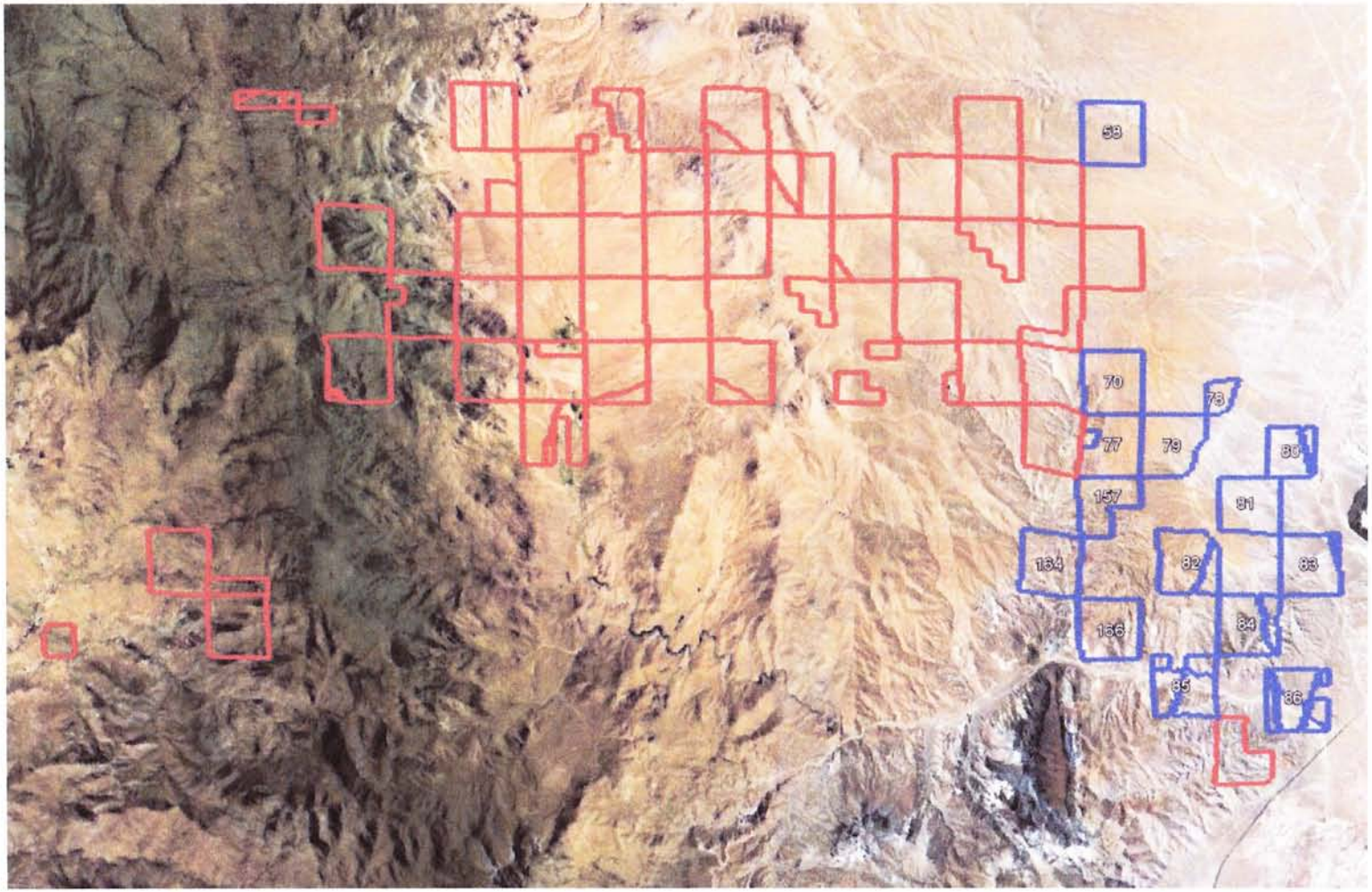

RRG Onyx Ranch Parcels (only the blue parcels were surveyed for Desert Tortoise) **Figure 1**
(parcel numbers are cross-referenced in Table 1)

Leatherman BioConsulting,, Inc.
Source Map: Google Earth

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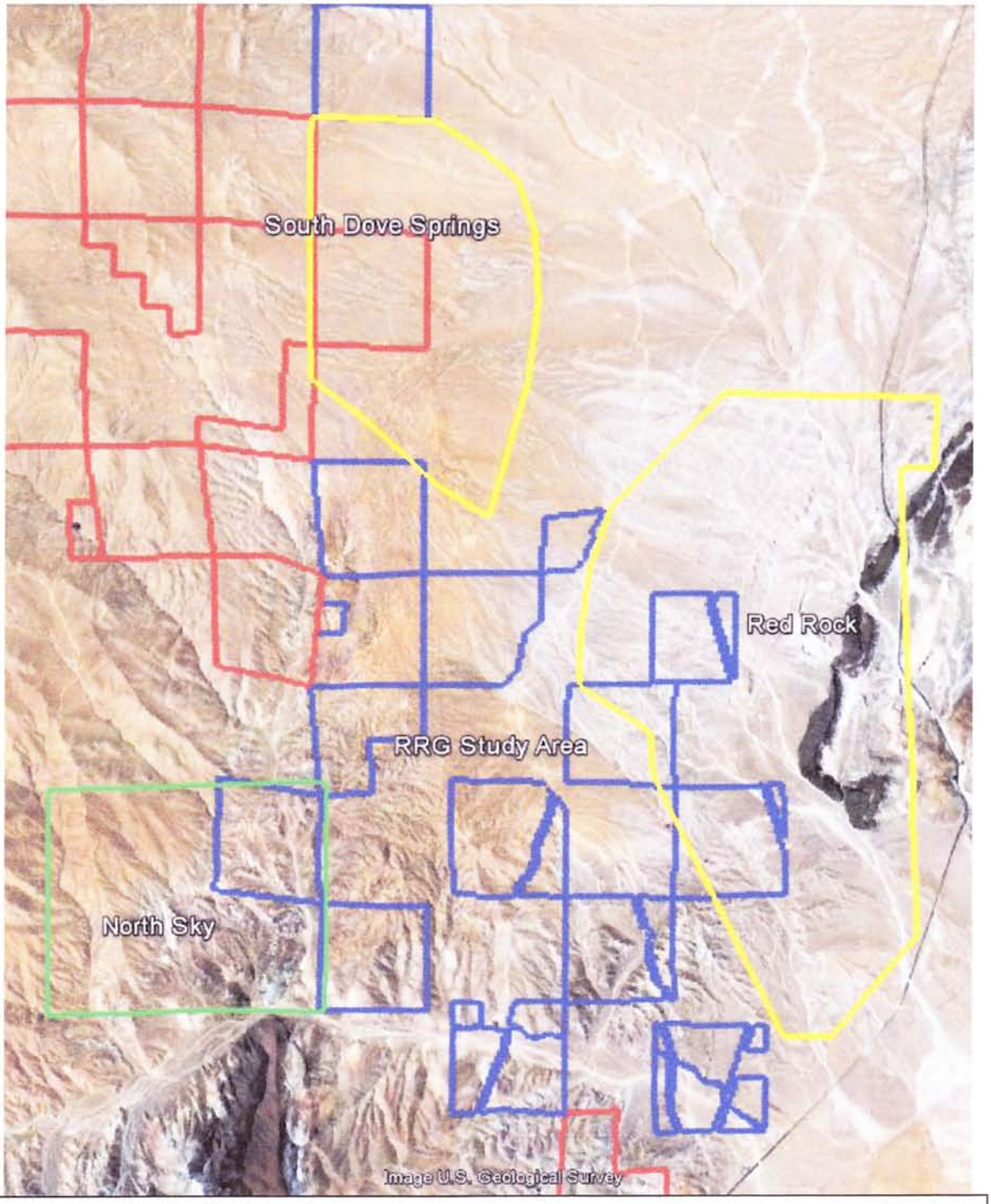

Desert Tortoise Studies in Region **Figure 2**
Blue = Onyx Ranch Study Area, Green = Phoenix (2010), Yellow = Keith et. al (2008)

Leatherman BioConsulting., Inc.
Source Map: TOPO!

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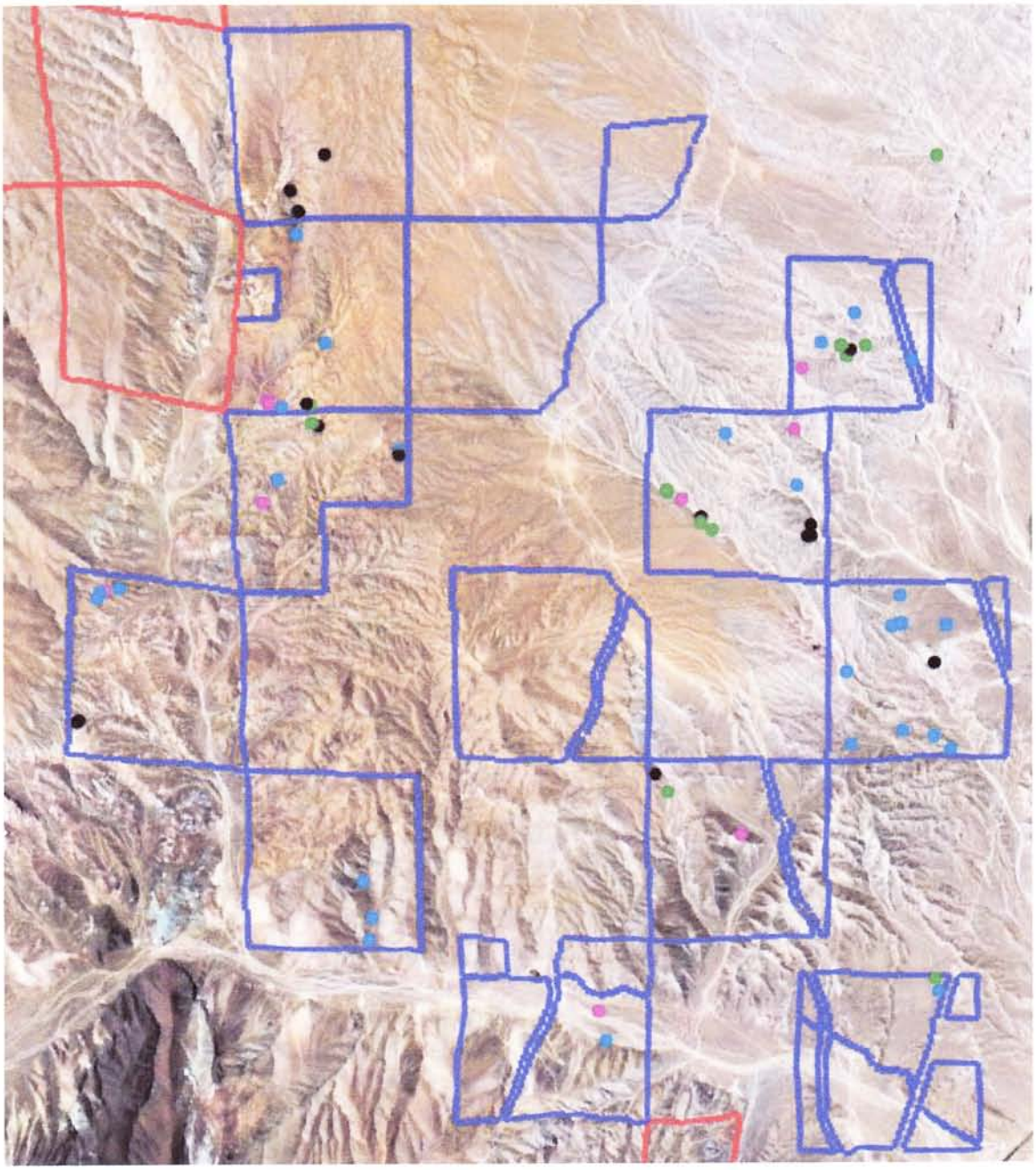
Onyx Ranch
Desert Tortoise Survey 2012



Desert Tortoise Sign
Green = Tortoise, Blue = Burrow, Black = Scat, Pink = Carcass

Figure 3

Leatherman BioConsulting,, Inc.
Source Map: Google Earth

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Leatherman BioConsulting, Inc.

Appendix A. Wildlife Observed or Detected during Desert Tortoise Survey of Renewable Resources Group Property

Non-native species are indicated by an asterisk. Species on CDFG's Special Animals list are indicated by two asterisks. Other species may have been overlooked or inactive/absent because of the season (amphibians are more active during/after rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate etc.), or because of the time of the survey (some species are strictly nocturnal). Taxonomy and nomenclature generally follow Stebbins (2003) for amphibians and reptiles, AOU (1998) for birds, and Jones et al. (1992) for mammals.

COMMON NAME	SCIENTIFIC NAME
REPTILES	**REPTILIA**
Land Tortoises	**Testudinidae**
** Desert tortoise	*Gopherus agassizii*
Iguanids	**Iguanidae**
Desert iguana	*Dipsosaurus dorsalis*
Spiny Lizards, Horned Lizards, etc.	**Phrynosomatidae**
Zebra-tailed lizard	*Callisaurus draconoides*
Desert spiny lizard	*Sceloporus magister*
Side-blotched lizard	*Uta stansburiana*
Whiptail Lizards	**Teiidae**
Western whiptail	*Cnemidophorus tigris*
Colubrids	**Colubridae**
Coachwhip	*Masticophus flagellum*
Gopher snake	*Pituophis catenifer*
Rattlesnakes	**Viperidae**
Sidewinder	*Crotalus cerastes*
Mojave rattlesnake	*Crotalus scutulatus*
BIRDS	**AVES**
Vultures	**Cathartidae**
Turkey vulture	*Cathartes aura*
Hawks, Eagles and Kites	**Accipitridae**
** Northern harrier	*Circus cyaneus*
Red-tailed hawk	*Buteo jamaicensis*
** Golden eagle	*Aquila chrysaetos*
Falcons	**Falconidae**
American kestrel	*Falco sparverius*
Grouse	**Phasianidae**
* Chukar	*Alectoris chukar*

Appendix A. Wildlife Observed or Detected during Desert Tortoise Survey of Renewable Resources Group Property

Quail	**Odontophoridae**
California quail	*Callipepla californica*
Pidgeons and Doves	**Columbidae**
Mourning dove	*Zenaida macroura*
Cuckoos and Roadrunners	**Cuculidae**
Greater roadrunner	*Geococcyx californianus*
Barn Owls	**Tytonidae**
Barn owl	*Tyto alba*
Owls	**Strigidae**
Burrowing owl	*Athene cunicularia*
Swifts	**Apodidae**
White-throated swift	*Aeronautes saxatalis*
Hummingbirds	**Trochilidae**
Costa's hummingbird	*Calypte costae*
Woodpeckers	**Picidae**
Northern flicker	*Colaptes auratus*
Tyrant Flycatchers	**Tyrannidae**
Flycatcher	*Empidonax* sp.
Gray flycatcher	*Empidonax wrightii*
Say's phoebe	*Sayornis saya*
Ash-throated flycatcher	*Myiarchus cinerascens*
Cassin's kingbird	*Tyrannus vociferans*
Shrikes	**Laniidae**
** Loggerhead shrike	*Lanius ludovicianus*
Jays and Crows	**Corvidae**
Steller's jay	*Cyanocitta stelleri*
Western scrub-jay	*Aphelocoma californica*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Larks	**Alaudidae**
** Horned lark	*Eremophila alpestris*
Swallows	**Hirundinidae**
Cliff swallow	*Petrochelidon pyrrhonota*
Barn swallow	*Hirundo rustica*
Wrens	**Troglodytidae**
Cactus wren	*Campylorhynchus brunneicapillus*
Rock wren	*Salpinctes obsoletus*

Appendix A. Wildlife Observed or Detected during Desert Tortoise Survey of Renewable Resources Group Property

Gnatcatchers	**Silviidae**
Blue-gray gnatcatcher	*Polioptila caerula*
Mockingbirds and Thrashers	**Mimidae**
Northern mockingbird	*Mimus polyglottis*
** Le Conte's thrasher	*Toxostoma lecontei*
Silky Flycatchers	**Ptilogonatidae**
Phainopepla	*Phainopepla nitens*
Wood Warblers	**Parulidae**
Orange-crowned warbler	*Vermivora celata*
Nashville Warbler	*Vermivora ruficapilla*
** Yellow warbler	*Dendroica petechia*
Yellow-rumped warbler	*Dendroica coronata*
Townsend's warbler	*Dendroica townsendi*
Wilson's warbler	*Wilsonia pusilla*
Tanagers	**Thraupidae**
Western tanager	*Piranga ludoviciana*
Towhees and Sparrows	**Emberizidae**
Green-tailed towhee	*Pipilo chlorurus*
California towhee	*Pipilo crissalis*
Black-throated sparrow	*Amphispiza bilineata*
Sage sparrow	*Amphispiza belli*
White-crowned sparrow	*Zonotrichia leucophrys*
Golden-crowned sparrow	*Zonotrichia atricapilla*
Dark-eyed junco	*Junco hyemalis*
Grosbeaks and Buntings	**Cardinalidae**
Black-headed grosbeak	*Pheucticus melanocephalus*
Lazuli bunting	*Passerina amoena*
Blackbirds and Orioles	**Icteridae**
Western meadowlark	*Sturnella neglecta*
Finches	**Fringillidae**
House finch	*Carpodacus mexicanus*
Lesser goldfinch	*Carduelis psaltria*
MAMMALS	**MAMMALIA**
Hares and Rabbits	**Leporidae**
Desert cottontail	*Sylvilagus audubonii*
Black-tailed jackrabbit	*Lepus californicus*
Squirrels	**Sciuridae**
White-tailed antelope squirrel	*Ammospermophilus leucurus*

Appendix A. Wildlife Observed or Detected during Desert Tortoise Survey of Renewable Resources Group Property

Pocket Gophers	**Geomyidae**
Botta's pocket gopher (burrows)	*Thomomys bottae*
Pocket Mice and Kangaroo Rats	**Heteromyidae**
Kangaroo rat (burrows)	*Dipodomys* sp.
Old World Rats and Mice	**Muridae**
Desert woodrat	*Neotoma lepida*
Dogs, Wolves and Foxes	**Canidae**
Coyote (scat, tracks)	*Canis latrans*
Kit fox	*Vulpes velox*
Weasels and Allies	**Mustelidae**
** American badger	*Taxidea taxus*
Deer	**Cervidae**
Mule deer	*Odocoileus hemionus*

Appendix B. Desert Tortoise Sign Detected during Renewable Resource Group Survey

Record No.	APN No.	Easting	Northing	Sign Type	Condition*	Comments
B-70-1	153-170-03	0402906	3915290	Burrow	4	Recent use by BUOW; on steep slope
S-70-1	153-170-03	0402920	3915287	Scat	2	Likely this year; in canyon on west half of section
S-70-2	153-170-03	0402843	3915471	Scat	5	Old scat in canyon on west half of section
S-70-3	153-170-03	0403157	3915761	Scat	5	Old scat in blackbush scrub
B-77-1	153-170-04	0402728	3913638	Burrow	4	Located in rock cave possible tortoise scat inside, end visible
B-77-2	153-170-04	0403130	3914181	Burrow	4	Decent turtle shape but back filled and deteriotated, ~0.3m deep, end visible
B-77-3	153-170-04	0402899	3915101	Burrow	2	~ 270 mm wide, < 1m deep, end visible
C-77-1	153-170-04	0402609	3913677	Carcass	1/2	Adult Male; some flesh at hind legs and cloaca area
C-77-2	153-170-04	0402587	3913700	Carcass	3	Adult male; bullet hole (~ .22 cal) in 1st left costal
S-77-1	153-170-04	0402956	3913661	Scat	3	2 more similar scat downslope
T-77-1	153-170-04	0402994	3913645	Tortoise	2	Adult female - MCL ~ 250mm, same individual observed following day (Record No. T-157-1)
B/C-80-2	153-240-16	0407745	3914419	Carcass Burrow	Carcarss = 5 Burrow = 2	Female, MCL ~ 220mm; burrow looks like it is from a smaller tortoise
B-80-1	153-240-16	0407448	3914167	Burrow	4	Good tortoise shape at opening but collapsed and backfilled
B-80-3	153-240-16	0408253	3914008	Burrow	3	Good tortoise shape but only 0.3m deep, end visible
S-80-1	153-240-16	0407703	3914099	Scat	2	Near tortoise (T-80-1)
T-80-1	153-240-16	0407674	3914047	Tortoise	1	Adult female, MCL ~ 220cm, active in wash
T-80-2	153-240-16	0407621	3914141	Tortoise	2	Adult male, MCL ~ 260mm; active in wash, left eye slightly damaged
T-80-3	153-240-16	0407628	3914138	Tortoise	1	Juvenile, MCL ~ 60 mm, likely hatched last fall, active in wash
T-80-4	153-240-16	0407841	3914139	Tortoise	1	Young male , MCL~ 180mm, active in wash
C-80-1	153-340-16	0407277	3913938	Carcass	5	Completely disarticulated, many bones missing, MCL ~ 190mm
B-81-2	181-020-02	0406598	3913382	Burrow	2	In bank of wash, 230mm wide, ~0.4m deep, end visible
B-81-3	181-020-02	0407224	3912924	Burrow	2	In bank of wash, 190 mm wide, end not visible
C-81-1	181-020-02	0407203	3913414	carcass	5	Completely disarticulated; appears to be young adult
C-81-2	181-020-02	0406202	3912808	Carcass	2	Male, MCL ~ 250mm
S-81-1	181-020-02	0407343	3912572	Scat	3	
S-81-2	181-020-02	0407344	3912477	Scat	3	Larger than S-81-1, possibly from different individual
S-81-3	181-020-02	0407314	3912473	Scat	3	
S-81-4	181-020-02	0406368	3912646	Scat	2	Near tortoise (T-81-3)
T/B-81-1	181-020-02	0406071	3912890	Tortoise Burrow	Tortoise = 1 Burrow = 1	Burrow above side of wash, 240mm wide, tortoise completely in burrow, facing outward
T-81-1	181-020-02	0406080	3912866	Tortoise	1	MCL ~ 326cm; active on in wash, same tortoise earlier in burrow (Record No. T/B-81-1)
T-81-2	181-020-02	0406465	3912535	Tortoise	1	MCL ~ 185-190mm; incidental observation of active tortoise
T-81-3	181-020-02	0406369	3912600	Tortoise	1	Same individual as observed incidentally (T-81-2)
B-83-1	181-020-13	0408574	3910561	Burrow	3	Caliche burrow, ~ 0.5m deep, end visible
B-83-10	181-020-13	0408048	3911669	Burrow	2	190mm wide, <1m deep, end visible
B-83-11	181-020-13	0408133	3911939	Burrow	3	230mm wide, end not visible
B-83-2	181-020-13	0407682	3910621	Burrow	3	200mm wide, end visible
B-83-3	181-020-13	0408144	3910736	Burrow	3	180mm wide, ~ 1m deep, end visible, bottom filled with debris

Appendix B. Desert Tortoise Sign Detected during Renewable Resource Group Survey

Record No.	APN No.	Easting	Northing	Sign Type	Condition*	Comments
B-83-4	181-020-13	0408427	3910680	Burrow	3	Caliche burrow, ~ 1.0m deep, end visible
B-83-5	181-020-13	0407648	3911269	Burrow	4	Backfilled, 240 mm wide, end not visible
B-83-6	181-020-13	0408540	3911672	Burrow	4	160mm wide, end visible
B-83-7	181-020-13	0408141	3911689	Burrow	3	180mm wide, backfilled, end not visible
B-83-8	181-020-13	0408137	3911688	Burrow	3	Large accessible burrow under creosote just below ridge, recent BUOW sign
B-83-9	181-020-13	0408125	3911695	Burrow	2	Actually two burrows side by side in wash, one with possible faint tracks
S-83-1	181-020-13	0408433	3911337	Scat	2	
B-85-1	181-080-11	405468	3907979	Burrow	4	Entrance with decent tortoise shape but not maintained, end visible
C-85-1	181-080-11	0405406	3908245	Carcass	2	MCL ~ 175mm; only back half of carapace found, normal color, scutes tight to bone
B-86-1	181-080-30	0408453	3908382	Burrow	4	Edge of drainage; unable to see the back of the burrow
T-86-1	181-080-30	0408421	3903499	Tortoise	1	Active on surface in late afternoon, MCL ~ 210mm
C-84-1	181-080-32	0406699	3909825	Carcass	3/4	Male, MCL ~ 260mm; shell intact completely, but all scutes sloughed.
S-84-1	181-080-32	0405936	3910386	Scat	2	In open on steep slope, this year
T/B-84-1	181-080-32	0406049	3910225	Tortoise Burrow	Tortoise = 1 Burrow = 1	Tortoise MCL ~ 190 to 200mm, completely in burrow facing in. Burrow 210mm wide, on steep slope near base of ravine
B-157-1	444-070-05	0403761	3913247	Burrow	2	300mm wide, 1.5m deep; heavy cattle use in the area
B-157-2	444-070-05	0402679	3913014	Burrow	4	160mm wide, <1m deep, end visible
C-157-1	444-070-05	0402557	3912812	Carcass	2	Front 1/2 of carapace only scutes tightly adhered to bone
S-157-1	444-070-05	0403058	3913466	Scat	5	Very old scat on ridge
S-157-2	444-070-05	0403760	3913207	Scat	3/4	Cluster of scats in this area
T-157-1	444-070-05	0403001	3913494	Tortoise	2	Adult female, MCL ~ 250mm, same individual observed previous day (Record No. T-77-1)
B-164-1	444-070-09	0401062	3912005	Burrow	4	Backfilled but good tortoise shape
B-164-2	444-070-09	0401088	3912054	Burrow	2	250mm wide, end not visible, carcass downslope
B-164-3	444-070-09	0401247	3912090	Burrow	3	180mm wide, <1m deep, end visible
C-164-1	444-070-09	0401128	3912073	Carcass	5	Carcass a male, MCL ~ 210mm
B-166-1	444-090-04	0403381	3908939	Burrow	4	160mm wide, debris at bottom of burrow, end visible
B-166-2	444-090-04	0403417	3909138	Burrow	3	160mm wide, end visible, back of burrow narrows to rodent hole
B-166-3	444-090-04	0403342	3909464	Burrow	3	180mm wide, ~ 0.2m deep, end visible, back of burrow narrows to rodent hole
T-INC-1	Incidental	0408491	3915786	Tortoise	1	Adult male tortoise, turned over with voided contents on plastron, rescued

*Burrows: 1 = currently active, with tortoise or recent sign, 2 = good condition, definitely tortoise but no recent sign, 3 = deteriorated - fair condition, definitely tortoise, 4 = dried, evident bleaching (yellow), loose material, 5 = good condition, possibly tortoise.

Scat: 1 = wet or freshly dried, obvious odor, 2 = dried with glaze and some odor, no bleaching, 3 = dried, no glaze or order, some bleaching, tightly packed, 4 = dried, evident bleaching (yellow), loose material, 5 = dried and bleached, only plant material remains

Carcass: 1 = fresh or putric, 2 = normal color, scutes adhering to bone, 3 = scutes peeling off bone, 4 = shell bones falling apart, 5 = bones disarticulated

Live Tortoise: 1 = healthy, 2 = URTD, 3 = healthy with chewed or damaged marginals, 4 = Ticks

Appendix C. Representative Photographs of Desert Tortoise Sign and Habitat during Renewable Resources Group Survey

Tortoise Record No. T-86-1

Tortoise Record No. T-80-2

Tortoise Record No. T-77-1

Tortoise Record No. T-80-3

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Appendix C. Representative Photographs of Desert Tortoise Sign and Habitat during Renewable Resources Group Survey

Tortoise Record No. T-INC-1

Carcass Record No. C-77-2 (note bullet wound in 1st left costal)

Carcass Record No. C-77-1

Carcass Record No. C-85-1 (in Jawbone Cyn OHV Open Area)

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Appendix C. Representative Photographs of Desert Tortoise Sign and Habitat during Renewable Resources Group Survey

Habitat along transect in APN 444-070-05

Habitat along transect in APN 181-080-32

Habitat along transect in APN 181-080-30

Habitat along transect in APN 153-150-04

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