Appendix D-26

Botanical Inventory Report Spring 2011

Alta East Wind Energy Project
Spring 2011
Botanical Survey Report

Prepared for:
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GANDA

Executive Summary

Botanical surveys for the approximately 917-acre survey area for the Alta East Wind Energy Project were conducted by Garcia and Associates (GANDA) on April 18-20, May 9-13, and 16, 2011. The purpose of the surveys was to locate and map special-status plant species, species afforded protection under the California Desert Native Plants Act (CDNPA), "large" Joshua trees (CH2M Hill 2010a), and invasive plant species. The transect-based botanical surveys following the guidelines of the California Department of Fish and Game (CDFG 2009a), the U.S. Fish and Wildlife Service (USFWS 1996a), and the California Native Plant Society (CNPS 2001) were initiated during the spring 2011 flowering period. A second round of late-season surveys for later-blooming species is planned for June of 2011 in order to complete the surveys to protocol-level.

Pre-field research was conducted to select special-status with potential to be found within the Project site. The list of potentially occurring special-status plants was derived from several sources, including U.S. Geological Survey 7.5' quadrangle-based searches of the California Natural Diversity Database (CNDDB 2011a), the CNPS on-line Inventory (2011), and other sources. Fifty-six special-status were determined to have potential to occur within the Project site based on habitat preferences and known distribution.

Three special-status were observed within the Project site: The Federal and State endangered Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), pale-yellow layia (*Layia heterotricha*: CNPS List 1B.1), and adobe yampah (*Perideridia pringlei*: CNPS List 4.3). A total of 112 individuals of Bakersfield cactus were mapped within the Project survey area. Three sites, each with a single plant were recorded for pale-yellow layia. Based on the lower than average seasonal rainfall totals in the vicinity of the Project, and observations of the low germination rates in other annual species in the area, it is likely that germination for pale-yellow layia was poor in 2011 and that larger populations occur in the area in favorable years. Areas of suitable clay soil habitat for pale-yellow layia were mapped in the vicinity of the observed individuals. Two adobe yampah plants in two separate locations were observed.

Inventoried and mapped species afforded protection under the CDNPA included 373 silver cholla (*Opuntia echinocarpa*), 728 beavertail cactus (*O. b.* var. *basilaris*), 112 Bakersfield cactus, and 1,433 chaparral yucca (*Yucca whipplei*).

A total of 1,135 Joshua trees (*Yucca brevifolia*) meeting the minimum size criteria for "large" trees were mapped during the surveys.

Ten species of invasive plant species were observed onsite. Infestations of six of these species were mapped and population numbers were estimated. The remaining four species are widespread and common throughout the Project area and were therefore not mapped.

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1.0 Introduction

Garcia and Associates, as a subcontractor to CH2M Hill Engineers, Inc. (CH2M HILL), was tasked with conducting botanical surveys for the Alta East Wind Energy Project (Project). The purpose of the botanical surveys was to locate and map occurrences of special-status and invasive plant species occurring within the proposed Alta East Wind Energy Project area. GANDA was not tasked with mapping or describing the vegetation communities occurring on the Project, as these have been reported previously (CH2M Hill 2010b).

1.1 Project description

Alta Windpower Development, LLC, proposes to develop the Alta East Wind Energy Project in southeastern Kern County, California. The Project area is located within the Tehachapi Wind Resource Area, a region recognized by the U.S. Department of Energy as having high wind energy resources. The Project will be located on Bureau of Land Management and private land. At full build-out, the Project is expected to produce an overall net generating capacity of up to 411 megawatts using up to 137 wind turbine generators. Associated supporting infrastructure including access roads, generator tie-in circuits, and transmission lines would also be constructed.

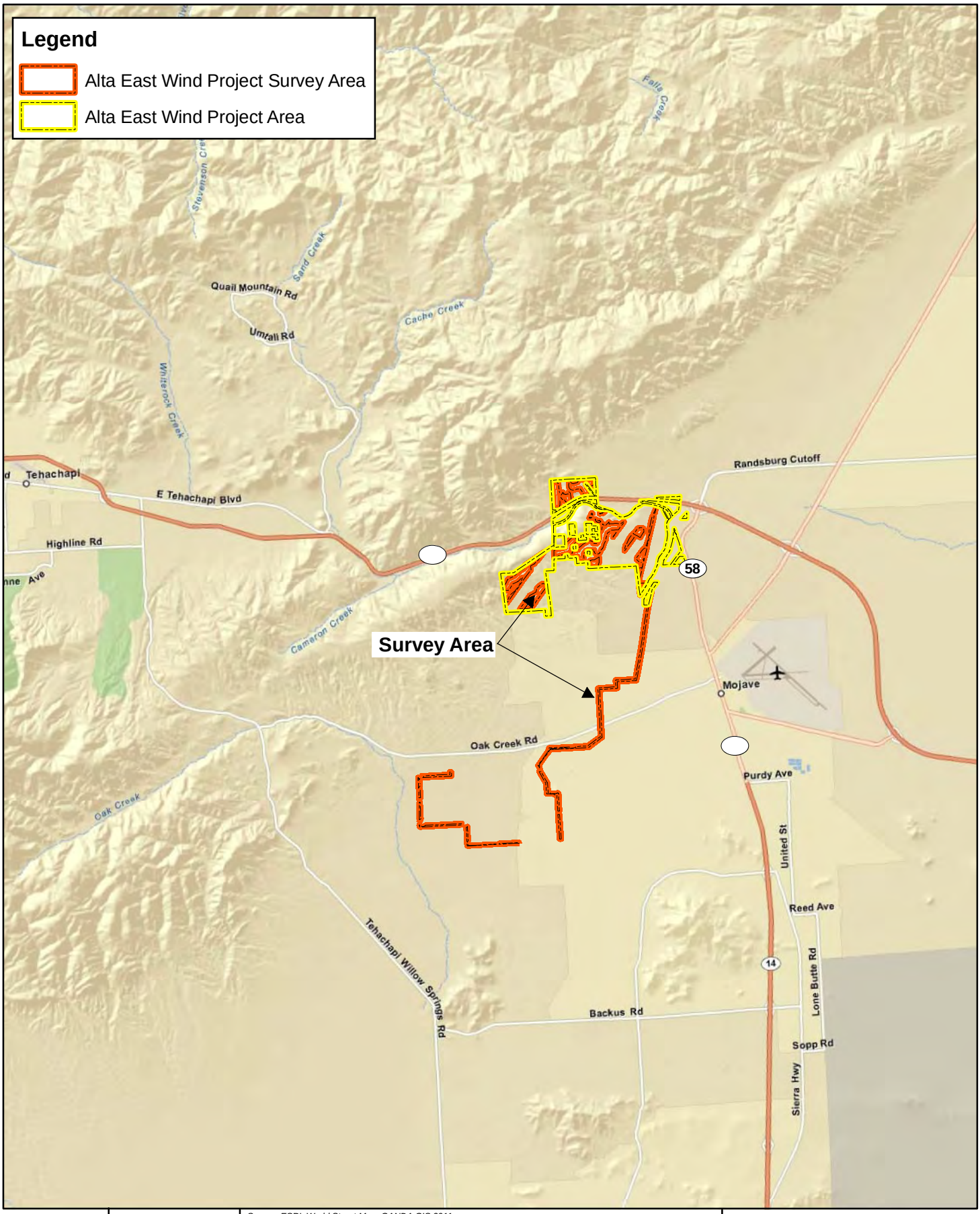
1.2 Project Location

The Project area is located in the Tehachapi Mountains in Kern County, California (Figure 1). The Project site is located approximately 4 miles northwest of the Mojave, California, on Bureau of Land Management and privately-owned land within the Mojave and Monolith 7.5' U.S. Geological Survey (USGS) quadrangles.

1.3 Environmental Setting and Climate

The terrain of the Project site varies between gentle slopes and valleys to steep ridges, hills, and drainages in the foothills. Elevations within the Project site range from approximately 3,000 to 3,900 feet. The Project site is not included in any Critical Habitat areas for federally listed plants designated by the USFWS.

Rainfall in the vicinity of the Project area preceding the 2011 botanical surveys was significantly below average. The historic (1971 to present) average annual precipitation in Mojave, California, located approximately 6 miles west of the Project area is 6.63 inches, and the average October through May precipitation is 5.87 inches. (NWS 2011). For October 2010 through May 2011, the total precipitation in Mojave was 1.34 inches (Weather Underground 2011).



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

Kilometers
0 4
Miles
0 4

Figure 1. Project location map.

Alta East Wind Project

Kern County, CA

June 2011

2.0 Methods

2.1 Special-status plants

2.1.1 Pre-field research and literature review

Prior to conducting the botanical surveys research was conducted to identify special-status plant species with potential to occur on the Project site. For each potentially occurring species, information was compiled on conservation status, distribution, habitat characteristics, flowering time, presence in the Project region, and characteristics used in field identification.

A plant was considered to be of special status if it met one or more of the following criteria:

- Federally or state-listed, proposed, or candidate for listing, as rare, threatened or endangered (USFWS 1996b, 2006, 2011; CNDDB 2011a, CNPS 2011); or
- Special Plant as defined by the CDFG CNDDB (CDFG 2011b); or
- Designated by the California Native Plant Society (CNPS) in its *Inventory of Rare and Endangered Plants of California* (CNPS 2011)

A species was determined to have potential to occur within the Project area if its known or expected geographic range includes the Project area or the vicinity of the Project area, and if its known or expected habitat is found within or near the Project area. For this project, the Project area vicinity includes the western Mojave Desert, Tehachapi Mountains, and southern Sierra Nevada.

A preliminary list of potentially occurring special-status plants was derived from several sources. Quadrangle-based searches of the CNPS Inventory (2011) and the CNDDB RareFind3 database (2011a) were used to identify potentially occurring special-status plants. The 7.5' USGS quadrangles containing the Project area (Mojave and Monolith), and 12 additional surrounding USGS 7.5' quadrangles (Sanborn, Soledad Mtn, Willow Springs, Tehachapi NE, Cache Peak, and Mojave NE) were included in the searches. A search of the CNPS database for List 1-3 taxa in these quadrangles returned 15 taxa. Four additional taxa were added to this list, based on recent observations at nearby project sites, for a total of 19. The CNDDB database search failed to return any additional CNPS List 1-3 taxa. CNPS List 4 species with the potential to occur in the vicinity of the Project were identified by searching the CNPS Inventory for all of Kern County. Seventy-one taxa were identified in this search. The combined List 4 and List 1-3 searches returned a total of 90 taxa, but only 45 of these were retained for potential occurrence in the project area. The others were excluded from consideration, because they either occurred well outside of the known distribution of the taxon, occurred in habitats not represented in the project area, occurred well outside of the known elevational range of the species, or were specific to soil types not believed to occur in the project areas.

Table 1 summarizes information on the 45 special-status plants determined to have the potential to occur on the Project site. The table includes information on flowering time, conservation status, habitat preferences, geographic distribution, elevation, and known locations in the vicinity of the Project area.

Table 1. Special-status plant species with the potential to occur on the Alta East Wind Energy Project.

Taxon	Status Fed/State/BLM/CNPS	Flowering period	Habitat and elevation	Potential for occurrence in the Project area
Allium atrorubens var. *cristatum* Inyo onion	--/--/--/4.3	Apr-Jun	Joshua Tree Woodland, Pinyon-Juniper Woodland - sandy or rocky sites. 3,940 - 8,400 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 42 mi northeast of the Project area in the Owens Peak watershed (CCH 2011).
Allium shevockii Spanish needle onion	--/--/SS/1B.3	May-Jun	Pinyon-Juniper Woodland, Upper Montane Coniferous Forest - in soil pockets on rock outcrops and talus slopes; bulbs mostly on margins of outcrops. 2,790 - 8,200 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 8 mi west of the Project area near upper Horse Canyon about 4 miles upstream from Sand Canyon (CNDDB 2011a).
Androsace elongata ssp. *acuta* California androsace	--/--/--/4.2	Mar-Jun	Chaparral, Cismontane Woodland, Coastal Sage Scrub, Valley and Foothill Grassland - highly localized and often overlooked little plant. 490 - 3,940 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 20 mi west of the Project area in the Tehachapi Mountains near Keene Station (CCH 2011).
Astragalus hornii var. *hornii* Horn's milk-vetch	--/--/SS/1B.1	May-Oct	Meadows and Seeps, Playas - lake margins, alkaline sites. 200 - 2,790 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 15 mi south of the Project area in Willow Springs. (CNDDB 2011a).
Calochortus striatus alkali mariposa lily	--/--/SS/1B.2	Apr-Jun	Chaparral, Chenopod Scrub, Mojavean Desert Scrub, Meadows - alkaline meadows and ephemeral washes. 230 - 5,230 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 12 mi south of the Project area along Sierra Highway between Sopp Road and Backus Road (CNDDB 2011a).
Camissonia kernensis ssp. *kernensis* Kern County evening-primrose	--/--/--/4.3	Mar-May	Joshua Tree Woodland, Pinyon and Juniper Woodland - sandy or gravelly granitic soils. 2,590 - 6,990 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 4 mi south of the Project area about 3 miles west of Hwy 14 on Oak Creek Drive (CCH 2011).
Canbya candida white pygmy-poppy	--/--/--/4.2	Mar-Jun	Joshua Tree Woodland, Mojavean Desert Scrub - sandy places. 1,970 - 4,790 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 4 mi east of the Project area 2 miles north of Mojave. (CNDDB 2011a).
Castilleja plagiotoma Mojave paintbrush	--/--/--/4.3	Apr-Jun	Great Basin Scrub, Pinyon-Juniper Woodland - alluvial fans. 980 - 8,200 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 6 mi west of the Project area near the intersection of Sand Canyon and Tranquility Roads (CCH 2011).

Taxon	Status Fed/State/BLM/CNPS	Flowering period	Habitat and elevation	Potential for occurrence in the Project area
Chamaesyce vallis-mortae Death Valley sandmat	--/--/--/4.2	May-Oct	Mojavean Desert Scrub - sandy or gravelly sites. 750 - 4,790 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. Possibly North Sky Records (GANDA 2010)
Chorizanthe spinosa Mojave spineflower	--/--/--/4.2	Mar-Jul	Chenopod Scrub, Mojavean Desert Scrub. 20 - 4,270 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 5 mi southeast of the Project area in Mohave (CCH 2011).
Clarkia xantiana ssp. *parviflora* Kern Canyon clarkia	--/--/--/4.2	May-Jun	Cismontane Woodland, Great Basin Scrub - dry slopes. 2,300 - 11,880 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 26 mi northwest of the Project area about 2 mi west of Kelso Valley Road, off of road to Piute Mountain (CNDDB 2011a).
Cordylanthus rigidus ssp. *brevibracteatus* short-bracted bird's-beak	--/--/--/4.3	Jul-Aug	Chaparral, Lower Montane Coniferous Forest, Pinyon-Juniper Woodland, Upper Montane Coniferous Forest - in openings, on granitic soil. 3,280 - 8,500 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 12 mi west of the Project area in Antelope Canyon south of Tehachapi (CCH 2011).
Deinandra mohavensis Mojave tarplant	--/SE/SS/1B.3	Jun-Oct(Jan),	Riparian Scrub, Chaparral - low sand bars in river bed; mostly in riparian areas or in ephemeral grassy areas. 2,110 - 5,280 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. Possibly North Sky Records (GANDA 2010)
Delphinium gypsophilum ssp. *gypsophilum* gypsum-loving larkspur	--/--/--/4.2	Feb-May	Chenopod Scrub, Valley and Foothill Grassland, Cismontane Woodland - on open slopes and in fields. 330 - 3,260 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 3 mi west of the Project area on the north slope of Tehachapi Pass (CCH 2011).
Delphinium parryi ssp. *purpureum* Mt. Pinos larkspur	--/--/--/4.3	May-Jun	Pinyon-Juniper Woodland, Mojavean Desert Scrub, Chaparral. 3,280 - 8,530 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 12 mi north of the Project area near Emerald Mountain (GANDA 2010).
Dudleya abramsii ssp. *calcicola* limestone dudleya	--/--/--/4.3	Apr-Aug	Chaparral, Pinyon-Juniper Woodland - rocky places on limestone. 1,640 - 8,530 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 17 mi northwest of the Project area about 3 km north of Twin Oaks in the southern Piute Mtns (CCH 2011).

Taxon	Status Fed/State/BLM/CNPS	Flowering period	Habitat and elevation	Potential for occurrence in the Project area
Eriastrum hooveri Hoover's eriastrum	DL/--/--/4.2	Mar-Jul	Chenopod Scrub, Valley and Foothill Grassland, Pinyon and Juniper Woodland - on sparsely vegetated alkaline alluvial fans; also in the temblor range on sandy soils. 160 - 3,000 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 22 mi south of the Project area on the southwest edge of Rosamond Dry Lake (CCH 2011).
Eriastrum tracyi Tracy's eriastrum	--/SR/SS/1B.2	Jun-Jul	Chaparral, Cismontane Woodland - gravelly shale or clay; often in open areas. 1,040 - 3,700 ft.	**Possible.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 12 mi north of the Project area about 1.5 miles northeast of Emerald Mountain (CNDDB 2011a).
Ericameria albida white-flowered rabbitbrush	--/--/--/4.2	Jun-Nov	Chenopod Scrub, Meadows and Seeps, saline or Alkaline Playas. 980 - 6,400 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 50 mi northeast of the Project area in Indian Wells Valley (CCH 2011).
Eriogonum kennedyi var. *pinicola* Kern buckwheat	--/--/SS/1B.1	May-Jun(Jul),	Chaparral, Pinyon and Juniper Woodland - open places on clay soil. 4,400 - 6,400 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 4 mi northeast of the Project area on a ridge south of Pine Tree Canyon (CNDDB 2011a).
Eriophyllum mohavense Barstow woolly sunflower	--/--/SS/1B.2	(Mar),Apr-May	Desert Chenopod Scrub, Mojavean Desert Scrub, Desert Playas - mostly in open, silty or sandy areas w/saltbush scrub, or creo. bush scrub. barren ridges or margins of playas. 1,640 - 3,150 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is Edwards Air Force Base 20 mi E of the project area (CNDDB 2011a)
Gilia interior inland gilia	--/--/--/4.3	Mar-May	Cismontane Woodland, Joshua Tree Woodland, Lower Montane Coniferous Forest - rocky sites. 2,300 - 5,580 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 23 mi south of the Project area west of Lancaster at 125th St. & Calif. Hwy 138 (CCH 2011).
Gilia latiflora ssp. *cuyamensis* Cuyama gilia	--/--/--/4.3	Apr-Jun	Pinyon and Juniper Woodland - sandy flats, lower river valleys. 1,970 - 6,560 ft.	**Unlikely.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 33 mi south of the Project area in the vicinity of Ritter Ridge on the south side of the Antelope Valley (CCH 2011).
Goodmania luteola golden goodmania	--/--/--/4.2	Apr-Aug	Meadows, Mojavean Desert Scrub, Playas, Valley and Foothill Grassland - in the central valley from Madera County to Kern County. 70 - 7,220 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 21 mi east of the Project area 8 mi north of Muroc (CCH 2011).

Taxon	Status Fed/State/BLM/CNPS	Flowering period	Habitat and elevation	Potential for occurrence in the Project area
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	--/--/SS/1B.1	Feb-Jun	Coastal Salt Marshes, Playas, Valley and Foothill Grassland, Vernal Pools - usually found on alkaline soils in playas, sinks, and grasslands. 0 - 4,000 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 12 mi west of the Project area in Tehachapi (CNDDB 2011a).
Layia heterotricha pale-yellow layia	--/--/SS/1B.1	Mar-Jun	Cismontane Woodland, Pinyon-Juniper Woodland, Valley and Foothill Grassland - alkaline or clay soils; open areas. 980 - 5,590 ft.	**Present.** Three individuals were mapped at three separate locations within the 2011 survey area. Additional suitable habitat is present.
Loeflingia squarrosa var. *artemisiarum* sagebrush loeflingia	--/--/--/2.2	Apr-May	Great Basin Scrub, Sonoran Desert Scrub, Desert Dunes - sandy flats and dunes. sandy areas around clay slicks w/*Sarcobatus*, *Atriplex*, *Tetradymia*, etc. 2,300 - 5,300 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 10 mi southeast of the Project area northeast of Actin (CNDDB 2011a).
Mentzelia eremophila solitary blazing star	--/--/--/4.2	Mar-May	Mojavean Desert Scrub. 2,300 - 4,000 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 9 mi north of the Project area on the east side of Barren Ridge, about 7.5 mi northwest of California City (CCH 2011).
Microseris sylvatica sylvan microseris	--/--/--/4.2	Mar-Jun	Chaparral, Cismontane Woodland, Great Basin Scrub, Pinyon-Juniper Woodland, Valley and Foothill Grassland - sometimes on serpentine. 150 - 4,920 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 12 mi west of the Project area in Tehachapi (CCH 2011).
Mimulus pictus calico monkeyflower	--/--/SS/1B.2	Mar-May	Broadleafed Upland Forest, Cismontane Woodland - in bare ground around gooseberry bushes or around granite rock outcrops. 330 - 4,270 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 6 mi northwest of the Project area near a tributary to Cache Creek/Sand Canyon, northeast of Monolith (CNDDB 2011a).
Monardella linoides ssp. *oblonga* Tehachapi monardella	--/--/SS/1B.3	Jun-Aug	Lower Montane Coniferous Forest, Upper Montane Coniferous Forest, Pinyon-Juniper Woodland - on dry slopes of yellow pine forest, decomposed granitic soils; also in roadside disturbed areas. 2,960 - 8,130 ft.	**Absent.** The species was not observed in surveys conducted outside of the flowering period, but the species is a perennial and would have been detected. No suitable habitat is present. The nearest known location is 8 mi north of the Project area about 0.8 mi SE of Cache Peak (CCH 2011).

Taxon	Status Fed/State/BLM/CNPS	Flowering period	Habitat and elevation	Potential for occurrence in the Project area
Muilla coronata crowned muilla	--/--/--/4.2	Mar-Apr(May),	Joshua Tree Woodland, Pinyon-Juniper Woodland, Mojavean Desert Scrub - mostly on barren flats and ridges in sandy, granitic soils. 2,510 - 6,430 ft.	**Unlikely.** The species was not observed in surveys conducted during the fruiting period. The nearest known location is 7 mi west of the Project area off of Oak Creek Rd., 8.9 mi west of Mojave (CCH 2011).
Navarretia setiloba Piute Mountains navarretia	--/--/SS/1B.1	Apr-Jul	Cismontane Woodland, Pinyon-Juniper Woodland, Valley and Foothill Grassland - red clay soils, other clay soils (?), or on gravelly loam. 1,000 - 6,890 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 24 mi northwest of the Project area on Piute Mountain Road, <3 miles from the Caliente Bodfish Road (CNDDB 2011a).
Nemacladus gracilis slender nemacladus	--/--/--/4.3	Mar-May	Cismontane Woodland, Valley and Foothill Grassland - sandy or gravelly places. 390 - 6,230 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 9 mi west of the Project area in Oak Creek Canyon, 1.8 miles southwest of intersection of Oak Creek Rd and Tehachapi Willow Springs Rd (CCH 2011).
Nemacladus secundiflorus var. *secundiflorus* large-flowered nemacladus	--/--/--/4.3	Apr-Jun	Chaparral, Valley and Foothill Grassland - dry, sandy to gravelly flats and slopes. 660 - 6,560 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 45 mi north of the Project area on Greenhorn Mountain (CCH 2011).
Opuntia basilaris var. *treleasei* Bakersfield cactus	FE/SE/SS/1B.1	Apr-May	Chenopod Scrub, Valley and Foothill Grassland, Cismontane Woodland - coarse or cobbly well-drained granitic sand on bluffs, low hills, and flats within grassland. 400 - 3,760 ft.	**Present.** 112 individual plants were mapped within the 2011 botanical survey area.
Pentachaeta fragilis fragile pentachaeta	--/--/--/4.3	Mar-Jun	Chaparral, Lower Montane Coniferous Forest - sandy soils. 150 - 6,890 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 17 mi north of the Project area in Kelso Valley (CCH 2011).
Perideridia pringlei adobe yampah	--/--/--/4.3	Apr-Jun(Jul),	Chaparral, Cismontane Woodland, Pinyon and Juniper Woodland, Coastal Scrub - serpentine grassland hillsides, clay soils, seasonally wet sites. 980 - 5,910 ft.	**Present.** Two individuals were mapped in two separate locations within the 2011 botanical survey area.
Phacelia cicutaria var. *hubbyi* Hubby's phacelia	--/--/--/4.2	Apr-Jun	Chaparral, Coastal Scrub, Valley and Foothill Grassland - gravelly, rocky areas and talus slopes. 0 - 3,280 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 17 mi north of the Project area near Jawbone area (CCH 2011).

Taxon	Status Fed/State/BLM/CNPS	Flowering period	Habitat and elevation	Potential for occurrence in the Project area
Phacelia exilis Transverse Range phacelia	--/--/--/4.3	May-Aug	Meadows, Lower Montane Coniferous Forest, Upper Montane Coniferous Forest - sandy or rocky slopes, flats, meadows. 3,610 - 8,860 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 24 mi northwest of the Project area to the southeast of Piute Peak (CCH 2011).
Phacelia nashiana Charlotte's phacelia	--/--/SS/1B.2	Mar-Jun	Joshua Tree Woodland, Mojavean Desert Scrub, Pinyon-Juniper Woodland - granitic soils; sandy or rocky areas on steep slopes or flats. 1,970 - 7,220 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 9 mi northeast of the Project area on an east slope of Barren Ridge, about 4.5 miles southwest of the mouth of Pine Tree Canyon (CNDDB 2011a).
Psorothamnus arborescens var. *arborescens* Mojave indigo-bush	--/--/--/4.3	Apr-May	Riparian Scrub - desert hillsides and stony flats on granitic bedrock. 1,310 - 3,890 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 24 mi north of the Project area in Red Rock Canyon (CCH 2011).
Sclerocactus polyancistrus Mojave fish-hook cactus	--/--/--/4.2	Apr-Jul	Joshua Tree Woodland, Mojavean Desert Scrub - well-drained soil, on rocky gravelly mesas, slopes & outcrops; sometimes on limestone. 2,100 - 7,610 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 25 mi north of the Project area in Red Rock Canyon (CCH 2011).
Streptanthus cordatus var. *piutensis* Piute Mountains jewel-flower	--/--/SS/1B.2	May-Jul	Broadleafed Upland Forests, Closed-Cone Coniferous Forest, Pinyon-Juniper Woodland - along roadbanks and cliffs, metamorphic-red clay soils. 3,590 - 5,990 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. No suitable habitat is present. The nearest known location is 7 mi northwest of the Project area on Sweetwater Ridge southeast of Cache Peak (CNDDB 2011a).
Viola purpurea ssp. *aurea* golden violet	--/--/SS/2.2	Apr-Jun	Great Basin Scrub, Pinyon-Juniper Woodland - dry, sandy slopes. 3,280 - 6,690 ft.	**Absent.** The species was not observed in surveys conducted during the flowering period. The nearest known location is 5 mi south of the Project area near Mojave Station (CNDDB 2011a), but the plants at this location were misidentified (John Little pers. com.)

Sources:
Bureau of land Management 2010; California Native Plant Society. 2010; California Natural Diversity Database. 2010;Jepson Online Interchange. 2010; Consortium of California Herbaria 2010.

[1] **Conservation status abbreviations:**

U.S. Fish and Wildlife Service designations:

FE Endangered: Any species in danger of extinction throughout all or a significant portion of its range.
FT Threatened: Any species likely to become endangered within the foreseeable future.

California Department of Fish and Game designations:

SE	Endangered: Any species in danger of extinction throughout all or a significant portion of its range.
ST	Threatened: Any species likely to become endangered within the foreseeable future.
SR	Rare: Any species not currently threatened with extinction, but in such small numbers throughout its range that it may become endangered if its present environment worsens.

Bureau of Land Management designations:

S	Special-Status
PI	Plant of Interest

California Native Plant Society designations:

1B	Plants rare, threatened or endangered in California and elsewhere.
2	Plants rare, threatened or endangered in California, but more common elsewhere.
3	Plants for which more information is needed – a review list.
4	Plants of limited distribution – a watch list.

California Native Plant Society threat categories:

.1	Seriously endangered in California.
.2	Fairly endangered in California.
.3	Not very endangered in California.

[2] **Occurrence potential definitions:**

Present:	Species observed on the site.
Likely:	Species not observed on the site, but reasonably certain to occur on the site.
Possible:	Species not observed on the site, but conditions suitable for occurrence.
Unlikely:	Species not observed on the site, conditions marginal for occurrence.
Absent:	Species or suitable habitat not observed on the site during protocol-level surveys.

2.1.2 Reference site visits

Reference site visits were conducted for six species of special-status plants with potential to occur at the Project site:

Alkali Mariposa lily (*Calochortus striatus*): Several hundred plants were observed in flowering condition in Alkali Sink habitat at the intersection of Avenue E and 60th St. north of Lancaster on May 13, 2011.

Pygmy poppy (*Canbya candida*): On May 2, 2011 plants were searched for in sandy soils within Blackbrush Scrub habitat at a location near Kelso Valley where the species was observed in 2010. No pygmy poppies were found in 2011.

Death Valley sandmat (*Chamaesyce vallis-mortae*): On May 2, 2011, about a dozen plants were observed in vegetative and early flowering conduction at a site near the Kelso Valley where the species was observed in 2010.

Mojave spineflower (*Chorizanthe spinosa*): Several hundred plants were observed in flowering condition in Alkali Sink habitat at the intersection of Avenue E and 60th St. north of Lancaster on May 13, 2011.

Golden goodmania (*Goodmania luteola*): About 20 plants were observed in early flowering condition in Alkali Sink habitat at the intersection of Avenue G and 30th St., north of Lancaster on May 6, 2011.

Bakersfield cactus: On April 25, 2011, the extensive population at the Sand Ridge Preserve (CNDDB Occurrence No. 3) was visited to compare spine characteristics at a known population of Bakersfield cactus with the spine-bearing individuals located on the project site.

2.1.3 Protocol-level surveys

Transect-based protocol-level botanical surveys following the guidelines of the California Department of Fish and Game (CDFG 2009a), the USFWS (1996a), and the CNPS (2001) were conducted on April 18-20, May 9-13, and 16, 2011. The goal of the surveys was to census, map, photograph and record habitat data for every special-status plant location that was detected. Surveys were floristic in scope, meaning that all plants found in identifiable condition were identified to the taxonomic level necessary to determine their rarity or listing status. A second round of late-season surveys of habitats determined during the initial round of surveys to be suitable for later-blooming special-status species is scheduled for June of 2011.

Global positioning systems (GPS) units were used to map special-status plant species, species protected under the California Desert Native Plants Protection Act (CDNPA), and invasive weed populations. Trimble® GeoXT GPS units with sub-meter accuracy were used to map all locations of special-status plants, and some of the weed and CDNPA locations. The remaining invasive weed and CDNPA species locations were mapped with Garmin GPS units with ~3m accuracy. The Trimble GPS units were equipped with data files for navigation and with data dictionaries for data collection. Data dictionaries and field data forms were used to record locality information, the actual or estimated number of individuals observed, and habitat information.

A list of all plant species observed was compiled for the Project site (Appendix A) during the surveys. Nomenclature for scientific names follows *The Jepson Manual* (Hickman 1993), except where noted.

The ability of surveyors to detect and identify plants rapidly and accurately in the field was enhanced by a field review of the common plant species at the Project site prior to beginning the surveys. All surveyors

were provided with photo guides of targeted special-status plants and preliminary species lists compiled prior to the field surveys.

2.1.4 Bakersfield cactus mapping and identification

There is currently some scientific disagreement about the proper taxonomic characteristics that should be applied to identify the Federal and State endangered Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), as opposed to the closely related variety, beavertail cactus (*O. b.* var. *basilaris*). Using identification criteria offered recently by CDFG, the listed species is very common on the project. However, using the keys and descriptions published in standard floras such as The Jepson Manual (Hickman, 1993), A California Flora (Munz and Keck 1973), and Flora of North America (FNA 1993), there are few, if any, individuals of the listed species on site. The CDFG has recently requested that varietal identification of *Opuntia basilaris* plants occurring in Kern County should use a recently-issued CDFG guidance document (Cypher 2011) that bases the taxonomic interpretation of the varieties largely on outdated or unpublished literature (e.g. Coulter 1896; Griffiths and Hare 1906; Britton and Rose 1920, and Bowen 1987). The diagnostic characteristics of Bakersfield cactus listed in the guidance document are reproduced in Table 2 below. Under this recently-issued guidance, plants possessing any one of the diagnostic characters listed in the table are to be considered "Bakersfield cactus." This approach has not yet been shown to accurately identify Bakersfield cactus; however, GANDA has used it to identify individuals of the listed variety for purposes of this report. GANDA recommends re-evaluating the identification of plants on the Project site as Bakersfield cactus using the standard criteria described in The Jepson Manual (Hickman, 1993), A California Flora (Munz and Keck 1973), and Flora of North America (FNA 1993).

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Table 2. Diagnostic characters that may help to differentiate *Opuntia basilaris* var. *treleasei* from var. *basilaris* [3] (reproduced from Cypher 2011).

Character	var. *basilaris*	var. *treleasei*	Inconclusive
Areole (eye-spot) position	depressed (sunken)	flush with surface or elevated	both depressed and flush on one plant
Number of areoles "across midstem segment" [4]	N/A[5]	<8 per diagonal row	8 or more per diagonal row or variable on one plant
Spines on pads	N/A	>6 mm long 2 or more in some areoles	no or few spines per pad, spines shorter than bristles (therefore not visible)
Ovary or fruit spines	none	3-10 rigid spines per upper areole or apical rim of spines	1-2 spines in upper areoles, weak spines, or both spiny and spineless fruits on one plant
Leaf length[6]	2 mm	5 mm	3-4 mm or absent
Pubescence on pads and fruits	pubescent (with downy hairs)	N/A	glabrous (hairless)
Chromosome number[7]	N/A	2n = 33	2n = 22

[3] Plants possessing even a single diagnostic characteristic of *Opuntia basilaris* var. *treleasei* should be considered to represent the endangered species for the purposes of project permitting and compliance with the California Endangered Species Act (CESA) and the California Environmental Quality Act (CEQA).

[4] Midstem segments are between the basal and terminal pads. Thus, this character is useful only for cactus plants that are three or more pads tall.

[5] Not applicable because the typical character state overlaps between var. *basilaris* and var. *treleasei*.

[6] Leaves are present for only a short time on young growth.

[7] A take permit is necessary to collect the root tips or flower buds needed for chromosome analysis.

During the botanical survey, every *Opuntia basilaris* plant occurring within the Project area was marked with a Trimble® GeoXT GPS unit. The character state for each of the diagnostic morphological characters provided in the CDFG guidance document (Cypher 2011) was recorded for each *Opuntia basilaris* plant directly into data dictionaries on the GPS units. All of the characteristics listed in the table were scored for each plant except for chromosome counts, which require a take permit, pubescence, which is difficult to score, and not diagnostic for the listed variety, and leaf length due to the ephemeral nature of the leaves. Following the surveys, the mapped cacti were assigned an identity based on the recommendations provided by CDFG (2011). Cacti displaying any one, or combination, of the diagnostic characters for var. *treleasei* were considered to be Bakersfield cactus. Cactus lacking any diagnostic characteristics of Bakersfield cactus were considered to be the common beavertail cactus.

2.2 California Desert Native Plants Act

All species afforded protection under the CDNPA were mapped concurrently with the botanical surveys. The CDNPA requires permits for the harvest or removal of certain endemic desert plant species in the Mojave and Sonoran deserts, and prohibits the take of certain species except for scientific or educational purposes. None of the species that are prohibited from take except for scientific or educational purposes are known to occur in the vicinity of the Project.

The CDNPA covers all members of the cactus family (*Cactaceae*), the agave family (*Agavaceae*), the torchwood family (*Burseraceae*), and the ocotillo family (*Fouquieriaceae*). The act also covers ironwood (*Olneya tesota*), mesquite (*Prosopis* spp.), palo verde (*Cercidium* spp.), fan palm (*Washingtonia filifera*), catclaw acacia (*Acacia greggii*), smoketree (*Psorothamnus spinosus*), desert holly (*Atriplex hymenelytra*), crucifixion thorn (*Castela emoryi*), and Panamint dudleya (*Dudleya saxosa*).

2.3 Joshua trees

GANDA was tasked with mapping "large" Joshua trees as defined by the Alta Oak Creek Mojave (AOCM) Joshua Tree Avoidance and Mitigation Plan (CH2M Hill 2010a). "Large" Joshua Trees are defined as trees that "are greater than nine feet tall, more than eight feet wide, and [with] more than seven branchings". During the floristic surveys, the location of each individual Joshua tree or group of trees that met the above criteria was marked with a Garmin or Trimble® GeoXT GPS unit. In some cases, groups of individual trees meeting the minimum size requirements were recorded as a single point and the number of trees per group was recorded.

2.4 Invasive plant species

An invasive plant species is a non-native plant that is included on the invasive plant lists of the California Department of Food and Agriculture (CDFA 2010) or the California Invasive Plant Council (Cal-IPC 2006). Several invasive plant species were widespread and abundant within the Project area and were therefore not mapped. Widespread and abundant invasive plant species observed on the site included cheatgrass (*Bromus tectorum*), red brome (*Bromus madritensis* ssp. *rubens*), Mediterranean grass (*Schismus* sp.) and redstem stork's bill (*Erodium cicutarium*). All other invasive weed species populations were mapped with GPS units. A single GPS point was recorded for each infestation area. Additional GPS points were recorded if the infestation had a visible break or if a significant change in density was observed.

3.0 Results

3.1 Special-status plants observed to occur on the project site

Three special-status plant species were observed within the Project site: the Federal and State Endangered Bakersfield cactus (Figure 2), pale-yellow layia (*Layia heterotricha*: CNPS List 1B.1), and Adobe yampah (*Perideridia pringlei*: CNPS List 4.3). Two adobe yampah plants in two separate locations were observed. Three sites, each with a single plant were recorded for pale-yellow layia, and several additional areas of suitable clay soils for this species were mapped (Figure 3). A total of 112 individual Bakersfield cactus plants were mapped within the Project survey area.

A discussion of each species is presented below. Maps depicting the location of each special-status species occurrence are presented in Figures 2 and 3, and the geographic coordinates of each occurrence are presented in Appendix B and C.

3.1.1 Bakersfield cactus

Bakersfield cactus is a perennial low-growing stem succulent in the Cactus family (Cactaceae) that typically spreads to form extensive thickets. The stems form fleshy, flattened green pads up to 18 cm long by 1 to 1.5 cm thick. The flowers are magenta and usually appear in May (ESRP 2006). Bakersfield cactus is State and Federally endangered and is included on CNPS List 1B.1.

The distribution of Bakersfield cactus has been described in a recent USFWS Recovery Plan (USFWS 1998) as restricted to a limited area of central Kern County near Bakersfield at elevations from approximately 460 to 1,800 feet. Previously, extensive colonies existed around Bakersfield, along the

bluffs of the Kern River, along the Caliente Creek drainage and nearby in the foothills of the western Tehachapi Mountains, and south to the Tejon Hills. Twisselmann (1967) describes a very large population in the Sand Ridge area near Arvin that eventually was protected by The Nature Conservancy within the Sand Ridge Preserve (USFWS 1998). The current distribution of Bakersfield cactus in the Bakersfield area is fragmented and much reduced (ESRP 2006). Specimen records from the Consortium of California Herbaria (2011) include three specimens from the Mojave Desert near the town of Mojave. These specimens are from the 1930s, and the occurrences in this report and others from the greater AOCM project area represent the most recent records of Bakersfield cactus in the Mojave Desert proper. Approximately one-third of the historical occurrences of Bakersfield cactus have been extirpated and the remaining populations are highly fragmented (USFWS 1998, ESRP 2006).

All of the *Opuntia basilaris* plants classified under the CDFG guidelines (2011) as Bakersfield cactus were observed to occur in the hills in the northern portion of the Project area (Figure 2). This is consistent with previous observations of these plants on the greater AOCM Project site, where the frequency of individuals with characteristics of Bakersfield cactus is greater on hilly sites at higher elevations.

3.1.2 Pale-yellow layia

Pale-yellow layia is an annual herb in the Sunflower family that occurs on alkaline or clay soils in Cismontane Woodland, Coastal Scrub, Pinyon and Juniper Woodland, and Valley and Foothill Grasslands (CNPS 2011). Known occurrences range in elevation from 984 to 5,592 feet. It has no State or Federal listing status, but is included on CNPS List 1B.1, indicating that it is rare, threatened or endangered in California and elsewhere, and seriously endangered in California.

In California, pale-yellow layia has been found in Fresno, Kings, Kern, Los Angeles, Monterey, Santa Barbara, San Benito, San Luis Obispo, and Ventura counties (CNPS 2011). The nearest previously known location to the Project area is in the Tomo-Kahni State Historic Park, seven miles north of the Project area (CCH 2011).

Three individual pale-yellow layia plants at three separate locations were observed. One of the individuals was located about 60 ft. outside of the survey boundary, while both of the other occurrences were within the Project boundary. The plants were found in non-native grasslands dominated by cheatgrass and red brome at two sites, and on barren soils at the third. At each location, the plants were associated with greenish-gray cracking clay soils. There are several clay lenses composed of these soils in a band adjacent to and below the prominent white alkaline rock outcrops that are visible on the areal imagery in the northern portion of the Project area (Figure 3). These outcrops are mapped as Torriorthents-rock outcrop complex, very steep by NRCS (2011), but the smaller clay inclusions associated with pale-yellow layia are not mapped, and the name of the clay soils series or horizon that serves as habitat for the species was not determined.

At each mapped site, only a single pale-yellow layia plant was observed, and the plants are likely to be more abundant during favorable years. It is possible that additional populations occur in areas with suitable soils, but were not detected due to the apparent low germination of the species in 2011. Germination for other annuals in the area also seems to have been poor in 2011. For example, thousands of dried desert candle (*Caulanthus coulteri*) remains from 2010 were observed on the same soils as pale-yellow layia, but only about a dozen live desert candle plants were observed in 2011. Areas of clay soils likely to be occupied by pale-yellow layia are depicted in Figure 3.

Pale-yellow layia has been assigned the State's highest rarity rank (list 1B.1), and the populations occurring on the Project site represent the easternmost known locations of the species, which has not been previously documented from the Mojave Desert. Impacts to these populations should be considered

significant under the California Environmental Quality Act. Avoidance of disturbance of these soils is recommended due to the possibility of larger populations of pale-yellow layia in the area during a more favorable rain year. Additional surveys are recommended.

3.1.3 Adobe yampah

Adobe yampah is a white-flowered perennial herb in the Carrot family (*Apiaceae*). It reaches 13 to 36 inches in height, and has oblong fleshy tuberous roots, dissected, slightly fleshy basal leaves, and flowers clustered in compound umbels (Hickman 1993). Adobe yampah flowers from April to June (CNPS 2011). It grows in Chaparral, Cismontane Woodland, Coastal Scrub, and Pinyon and Juniper Woodland communities at elevations ranging from 985 to 5,900 feet (CNPS 2011). Adobe yampah has no State or Federal listing status, but is included on CNPS List 4.3, a watch list (ibid.).

Adobe yampah is endemic to California, where it is known from Kern, Los Angeles, Monterey, Santa Barbara, San Luis Obispo, Tulare, and Ventura counties (CNPS 2011). There are many collections from Kern County (CCH 2011). Prior to surveys conducted for this project, the closest record was about ten miles southwest of the Project area at Tomo-Kahni State Historical Park, northeast of Monolith and Tehachapi (ibid.).

Adobe yampah was detected in 2 locations within the survey area during botanical surveys. Although both plants observed were in early flowering condition, it is likely that other plants occur in the area but were not yet flowering, as the normal flowering period for this species in the area is in June (E. Kentner pers. obs.). Because vegetative individuals are inconspicuous, additional surveys are planned to estimate the full extent of the populations in the Project area.

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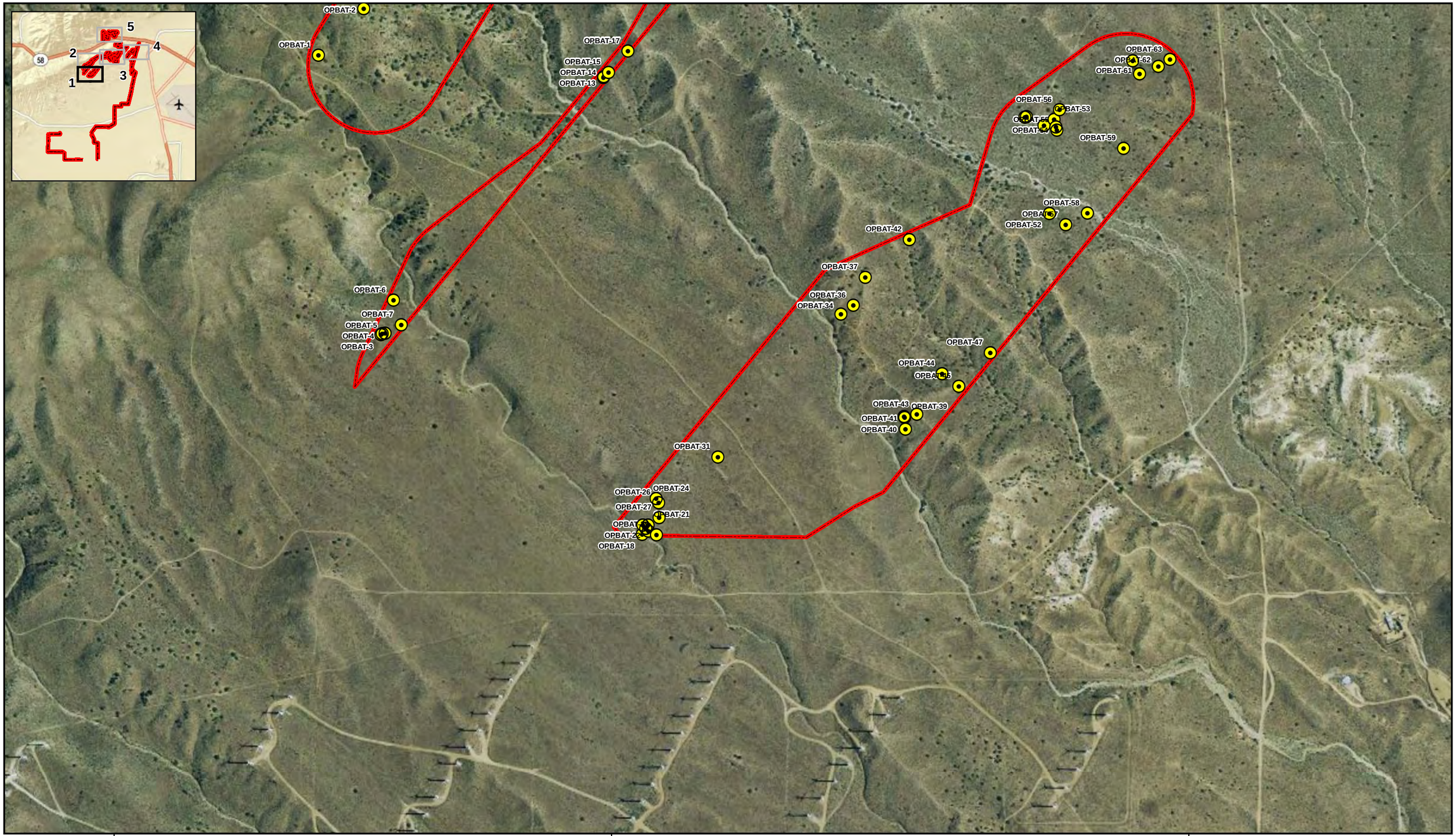


GANDA

Legend

Alta East Wind Project Survey Area

Bakersfield cactus

Opuntia basilaris var. treleasei

0 200 Meters

0 1,000 Feet

1 inch = 500 feet

Figure 2. Bakersfield cactus location map.
Alta East Wind Project

Kern County

June 2011

Map 1 of 5

GANDA

Legend

Alta East Wind Project Survey Area

Bakersfield cactus

Opuntia basilaris var. treleasei

Project Location

0 Meters 200

0 Feet 1,000

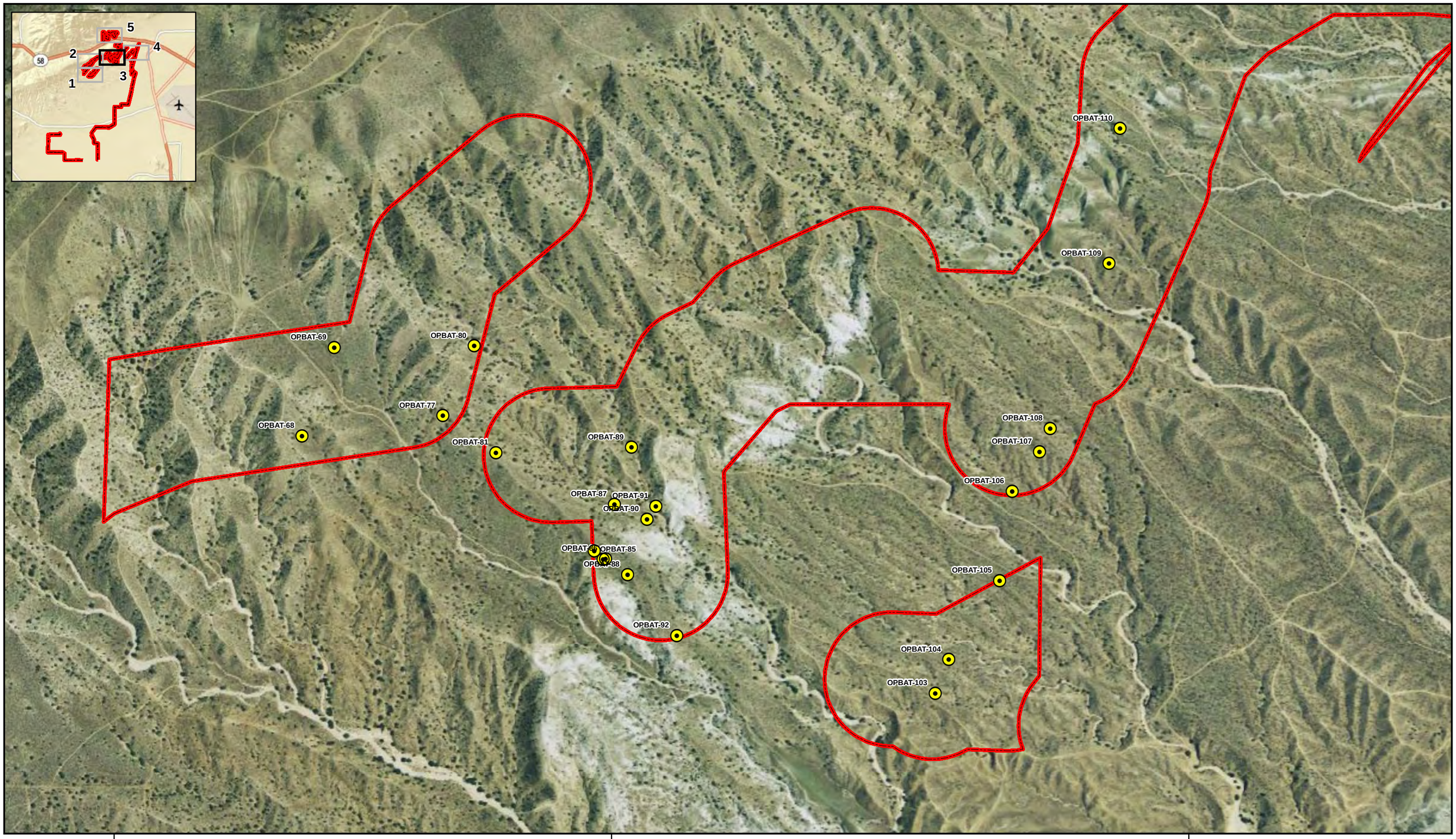
1 inch = 500 feet

Figure 2. Bakersfield cactus location map.
Alta East Wind Project

Kern County

June 2011

Map 2 of 5



GANDA

Legend

Alta East Wind Project Survey Area

Bakersfield cactus

Opuntia basilaris var. treleasei

Project Location

0 200 Meters

0 1,000 Feet

1 inch = 500 feet

Figure 2. Bakersfield cactus location map.
Alta East Wind Project

Kern County

June 2011

Map 3 of 5

GANDA

Legend

Alta East Wind Project Survey Area

Bakersfield cactus

Opuntia basilaris var. treleasei

Project Location

0 Meters 200

0 Feet 1,000

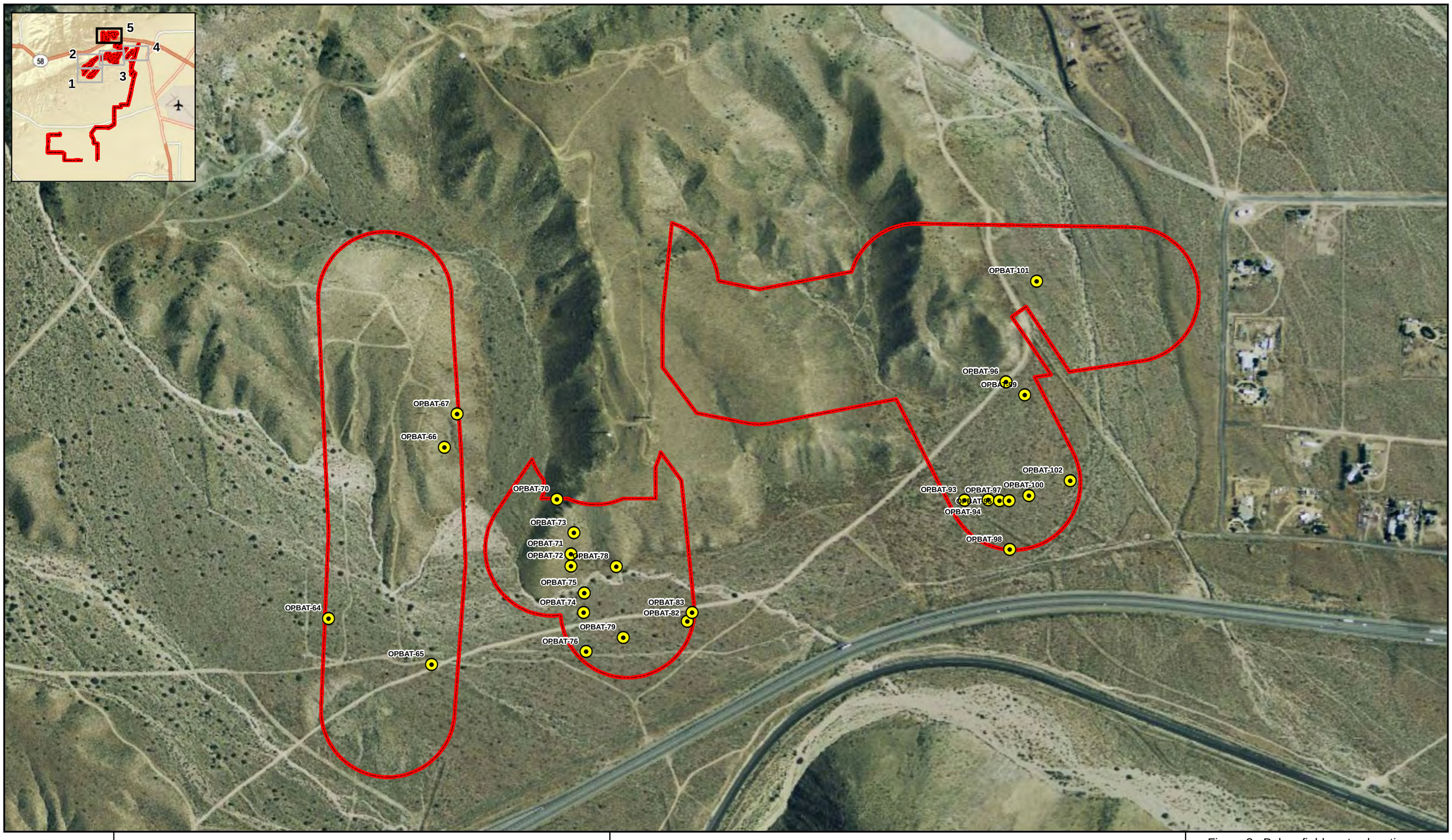
1 inch = 500 feet

Figure 2. Bakersfield cactus location map.
Alta East Wind Project

Kern County

June 2011

Map 4 of 5



GANDA

Legend

Alta East Wind Project Survey Area

Bakersfield cactus

Opuntia basilaris var. treleasei

Project Location

0 Meters 200

0 Feet 1,000

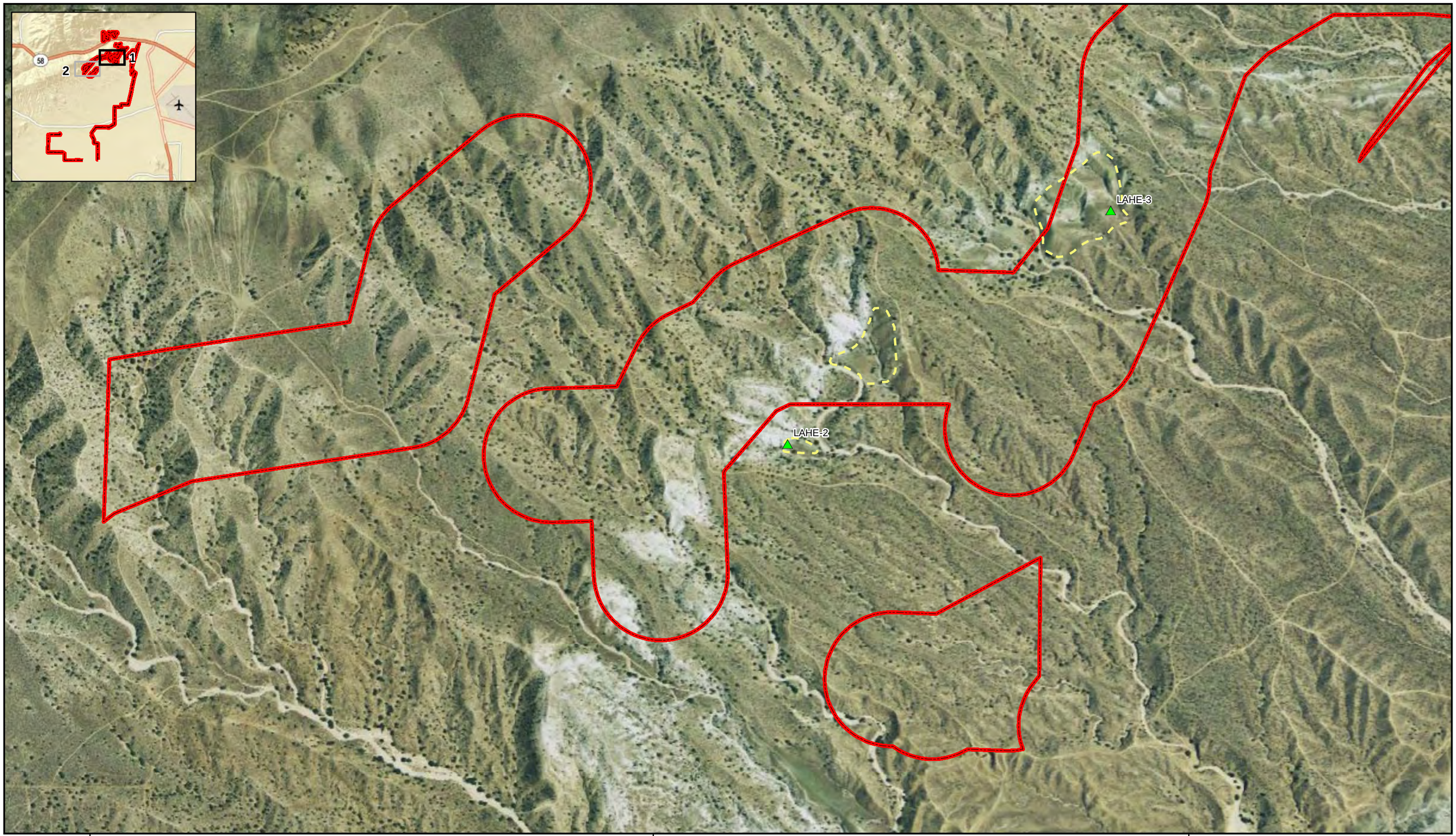
1 inch = 500 feet

Figure 2. Bakersfield cactus location map.
Alta East Wind Project

Kern County

June 2011

Map 5 of 5



GANDA

Legend

Alta East Wind Project Survey Area

Pale-yellow Layia Suitable Habitat

Special Status Plants

Layia Heterotricha - Pale-yellow Layia

Perideridia Pringlei - Adobe Yampah

Project Location

0 200 Meters

0 1,000 Feet

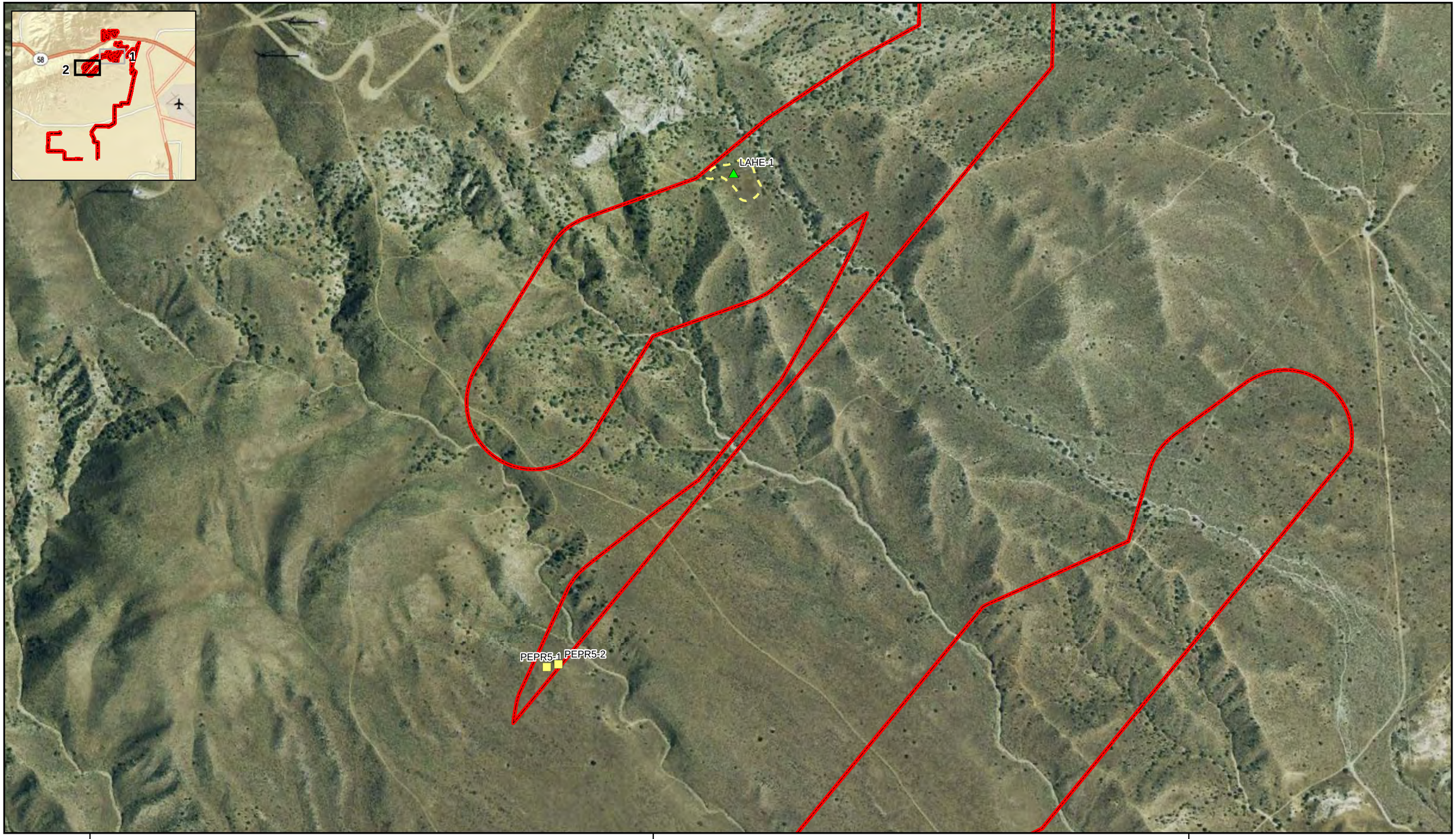
1 inch = 500 feet

Figure 3. Special-status plants location map.
Alta East Wind Project

Kern County

June 2011

Map 1 of 2



GANDA

Legend

Alta East Wind Project Survey Area

Pale-yellow Layia Suitable Habitat

Special Status Plants

Layia Heterotricha - Pale-yellow Layia

Perideridia Pringlei - Adobe Yampah

Project Location

0 200 Meters

0 1,000 Feet

1 inch = 500 feet

Figure 3. Special-status plants location map.
Alta East Wind Project

Kern County

June 2011

Map 2 of 2

3.2 Special-status plants not observed, but with the potential to occur on the project site

Of the 45 species determined to have the potential to occur in the vicinity of the project area as a result of the literature and database searches, 30 species have been determined to be absent from the project area based on the survey results. Three species were observed, 11 species are unlikely to occur or may have been undetectable at the time of the surveys due to their later flowering periods (Table 1), and one species, Tracy's eriastrum is considered possible pending further late-season surveys. Additional surveys of the project area for late blooming taxa are scheduled for June of 2011.

Species accounts and assessments of habitat suitability within the Project survey area for each of the special-status species not observed, but with the potential to occur in the Project vicinity are presented in Appendix E.

3.3 California Desert Native Plants Act

Four species afforded protection under the CDNPA, in addition to Joshua trees (Section 3.4 below) were observed within the survey area (Figure 4). A total of 673 silver cholla (*Opuntia echinocarpa*), 1,433 chaparral yucca (*Yucca whipplei*), 728 beavertail cactus, and 112 Bakersfield cactus were inventoried and mapped (Figure 3).

3.4 Joshua trees

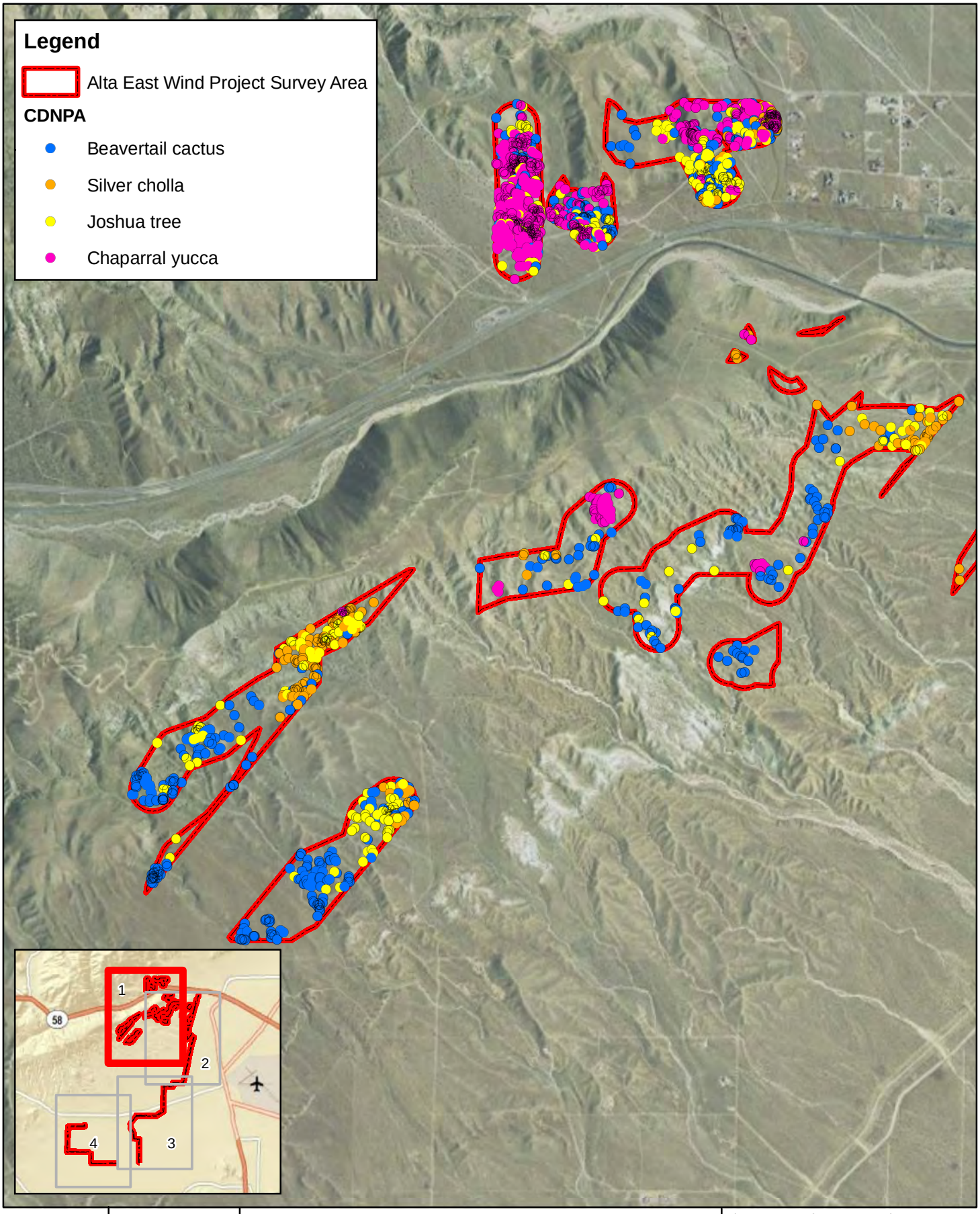
A total of 1,135 Joshua trees meeting the "large" size criteria established in the AOCM Joshua Tree Avoidance and Mitigation (CH2M Hill 2010a) Plan were inventoried and mapped (Figure 4).

3.5 Invasive plant species

Portions of the Project area have been grazed by sheep for an unknown period of time, a disturbance regime that seems to have favored the establishment and spread of many species of invasive plant species. Widespread and abundant plant species observed to occur at various densities throughout the Project area include cheatgrass, red brome, Mediterranean grass and redstem stork's bill. Populations of these species were not tallied or mapped for this report. Mapped species of invasive plant species occurring on the Project site include ripgut brome (*Bromus diandrus*), flixweed (*Descurainia sophia*), shortpod mustard (*Hirschfeldia incana*), wall barley (*Hordeum murinum*), tumble mustard (*Sisymbrium altissimum*), and oriental hedge mustard (*Sisymbrium orientale*). Table 4 presents the number of locations and estimated total number of individuals observed for each invasive weed species mapped in the Project area. The locations of invasive weed infestations are depicted in Figure 5.

Table 3. Invasive plant species observed on the Alta East Wind Energy Project site.

Invasive Weed Species	Sites mapped	Est. No. observed
Ripgut brome	3	320
Flixweed	4	53
Shortpod mustard	6	160
Wall barley	14	3,801
Tumble mustard	4	96
Oriental hedge mustard	9	130



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

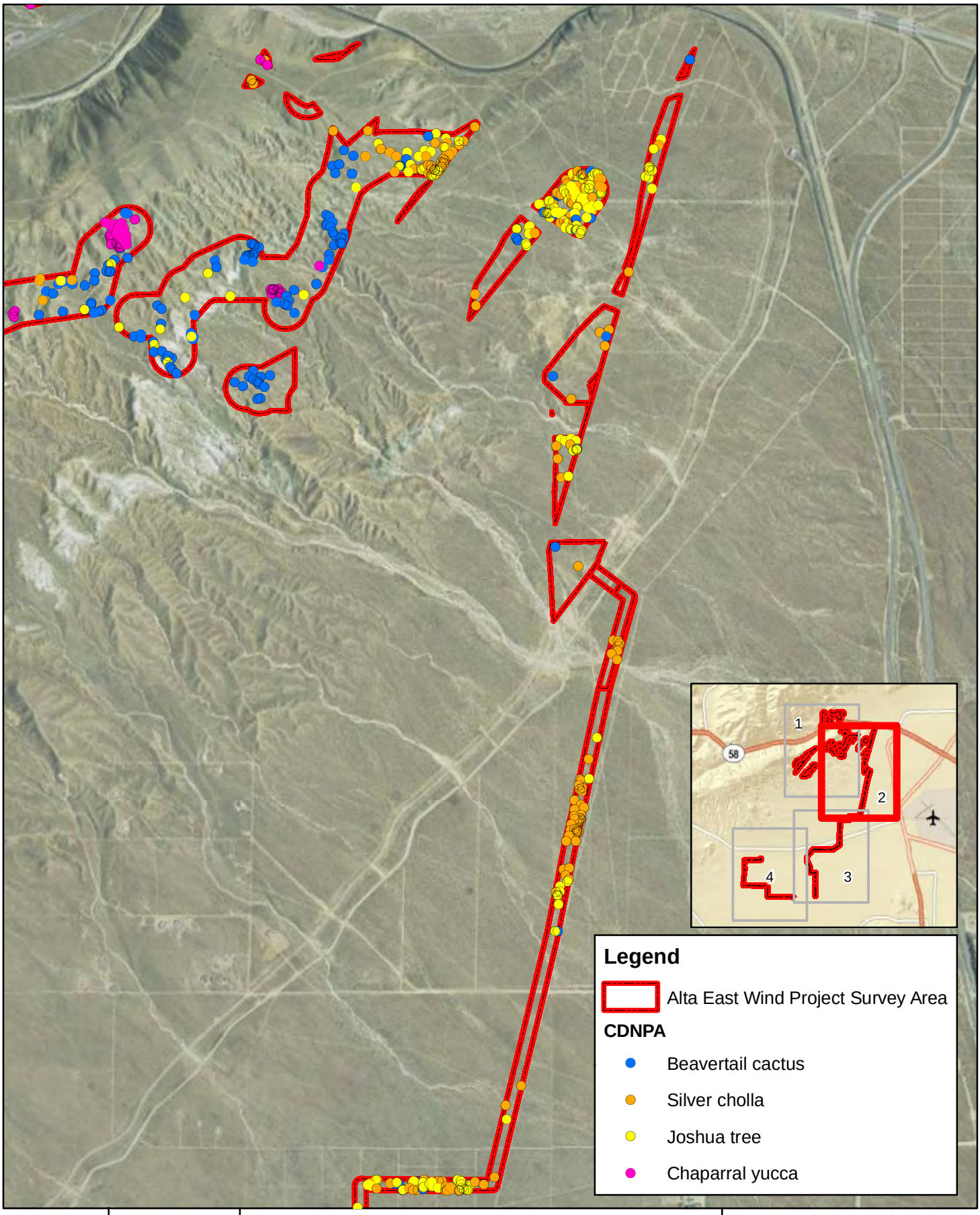
Kilometers
0 1

Miles
0 1

Figure 4. Joshua tree and CDNPA species location map.
Alta East Wind Project

Kern County

June 2011



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

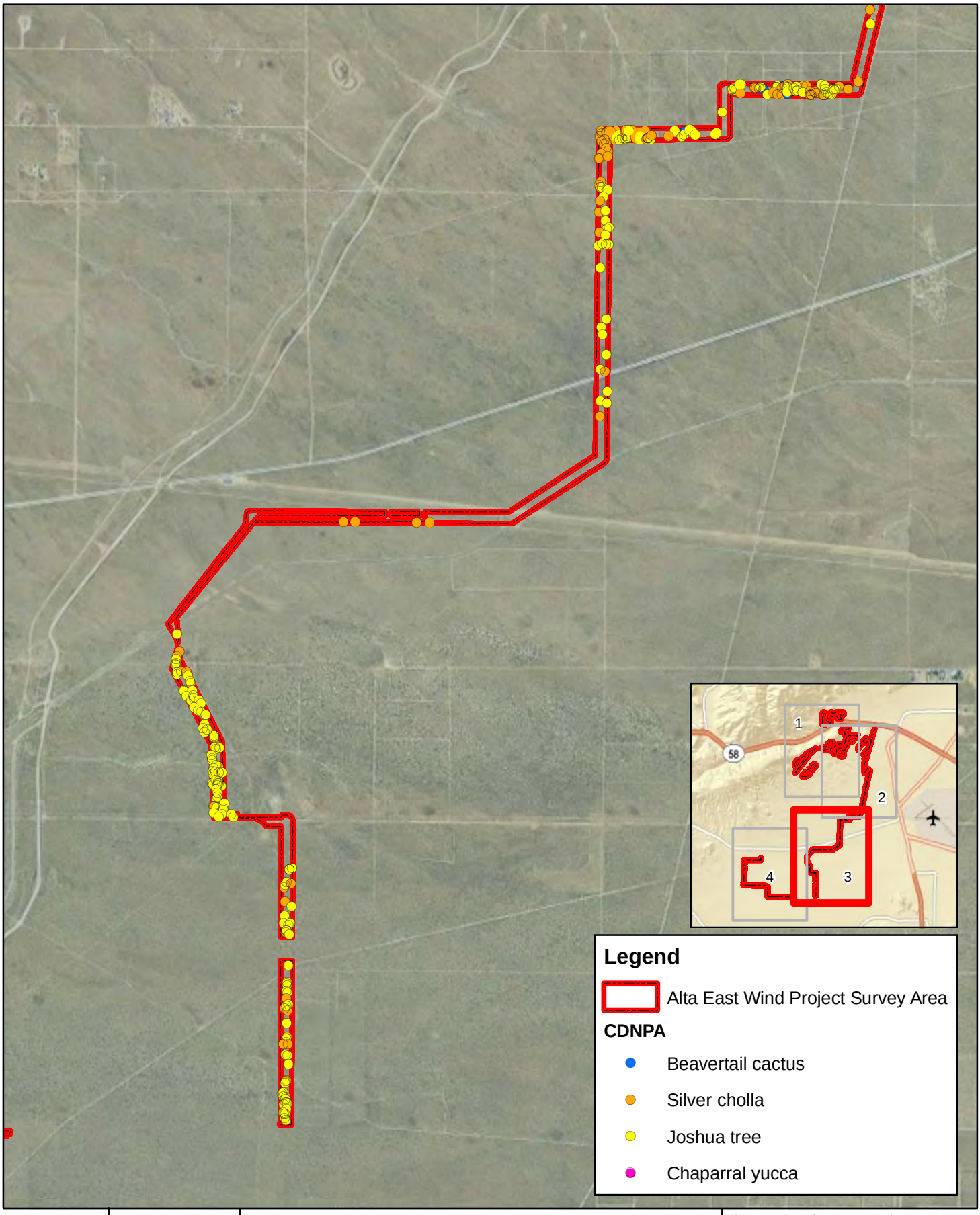
0 1 Kilometers

0 1 Miles

Figure 4. Joshua tree and CDNPA species location map.
Alta East Wind Project

Kern County

June 2011



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

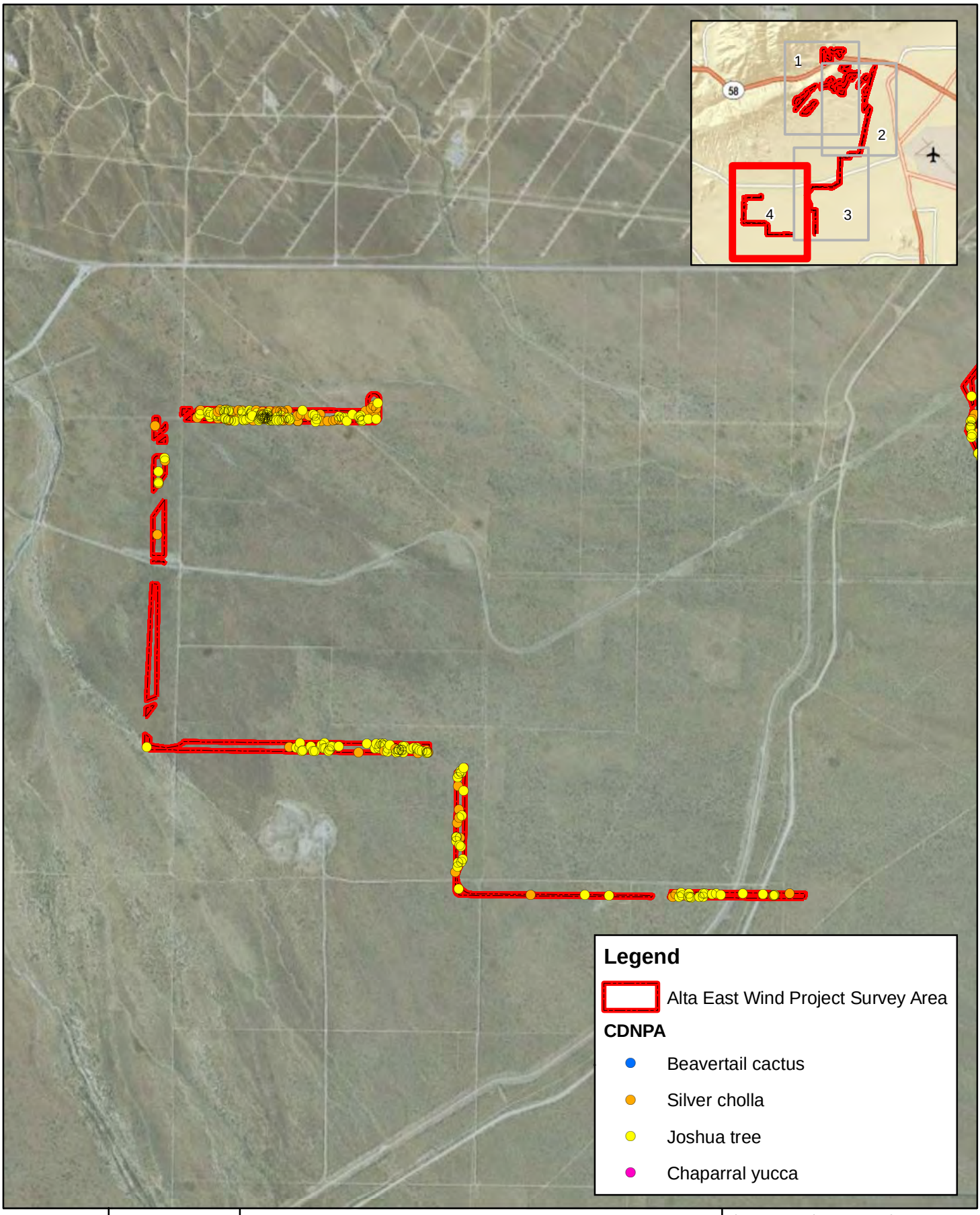
0 1 Kilometers

0 1 Miles

Figure 4. Joshua tree and CDNPA species location map.
Alta East Wind Project

Kern County

June 2011



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

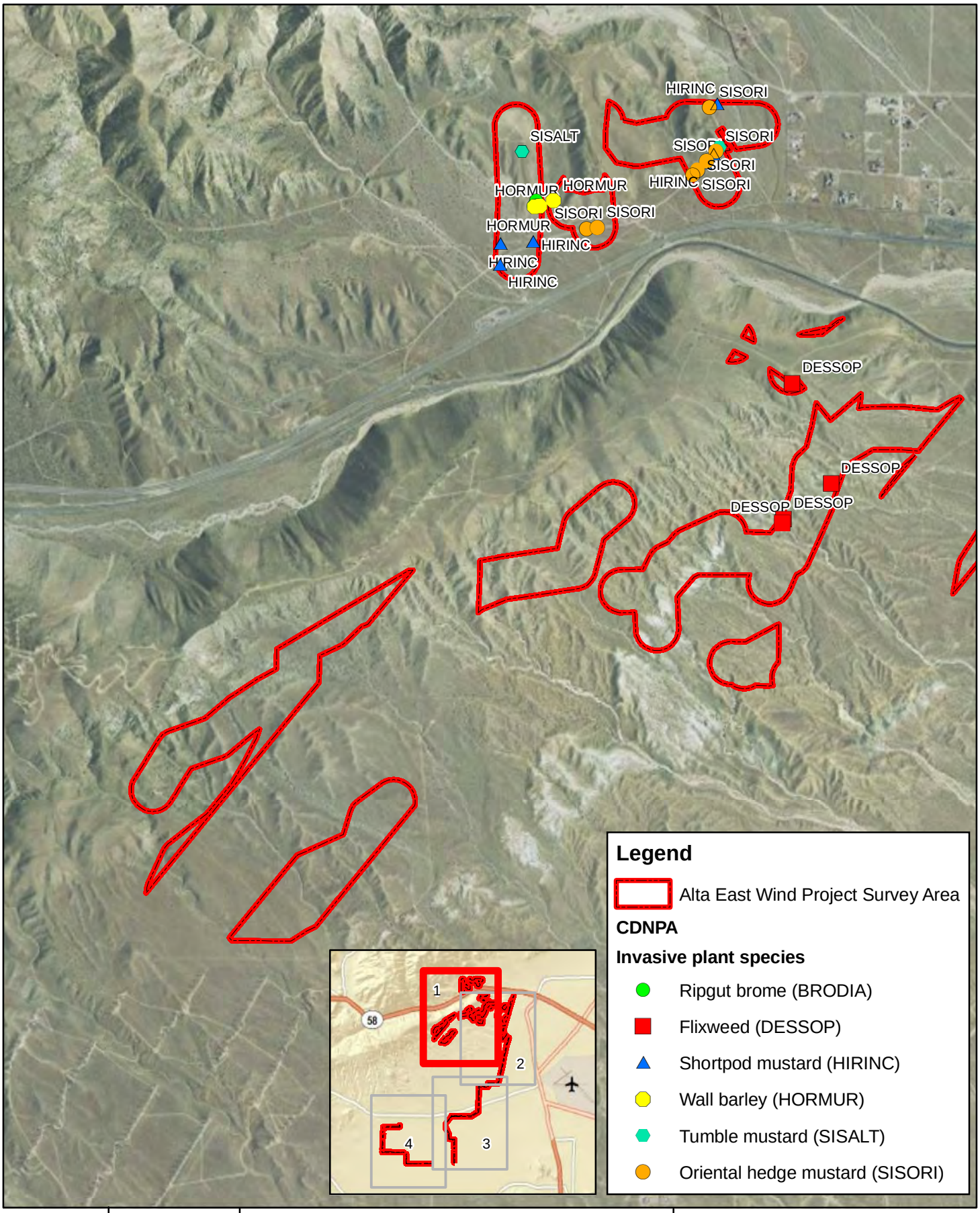
0 1 Kilometers

0 1 Miles

Figure 4. Joshua tree and CDNPA species location map.
Alta East Wind Project

Kern County

June 2011



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

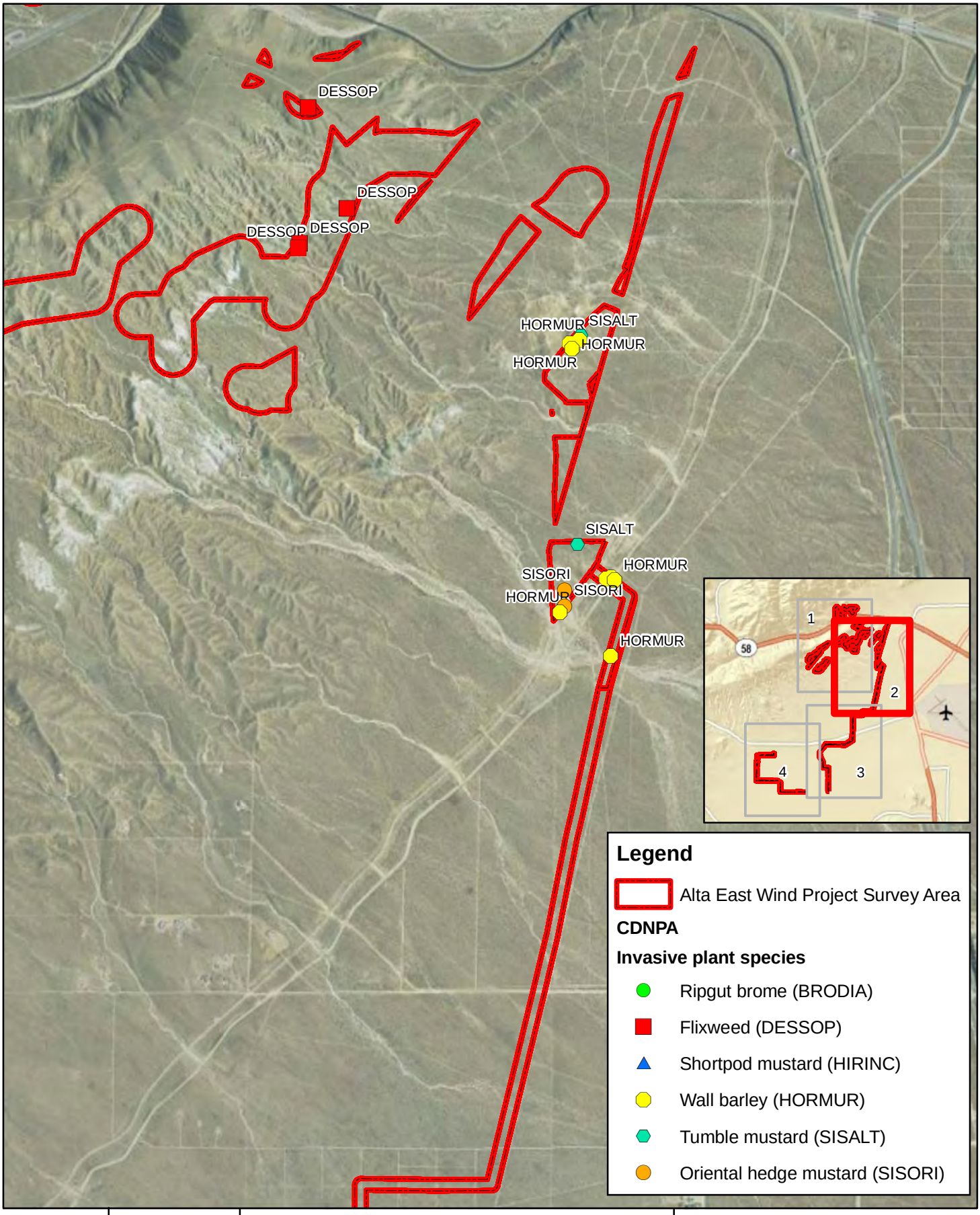
Kilometers
0 1

Miles
0 1

Figure 5. Invasive plant species location map.
Alta East Wind Project

Kern County

June 2011



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

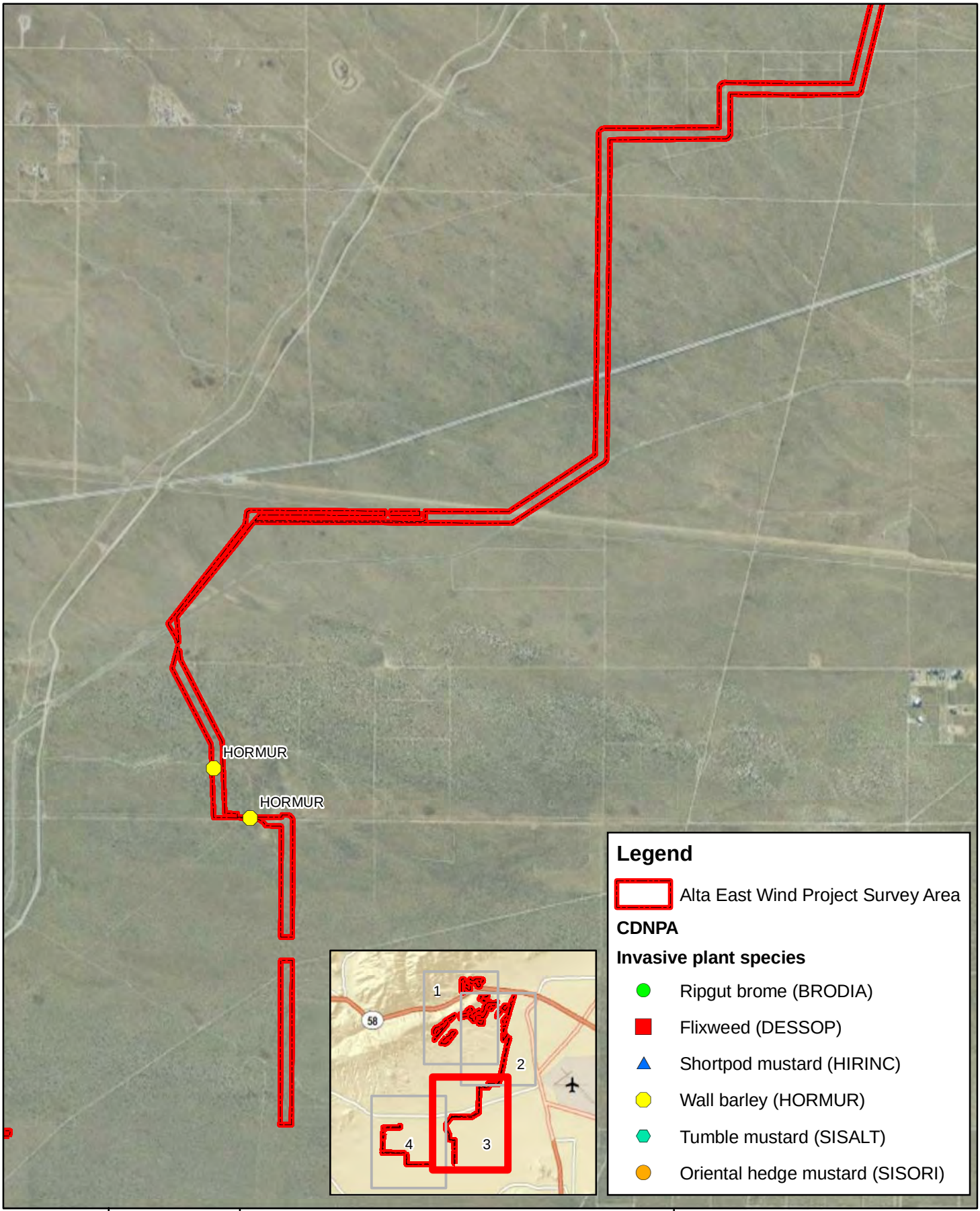
Kilometers
0 1

Miles
0 1

Figure 5. Invasive plant species location map.
Alta East Wind Project

Kern County

June 2011



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

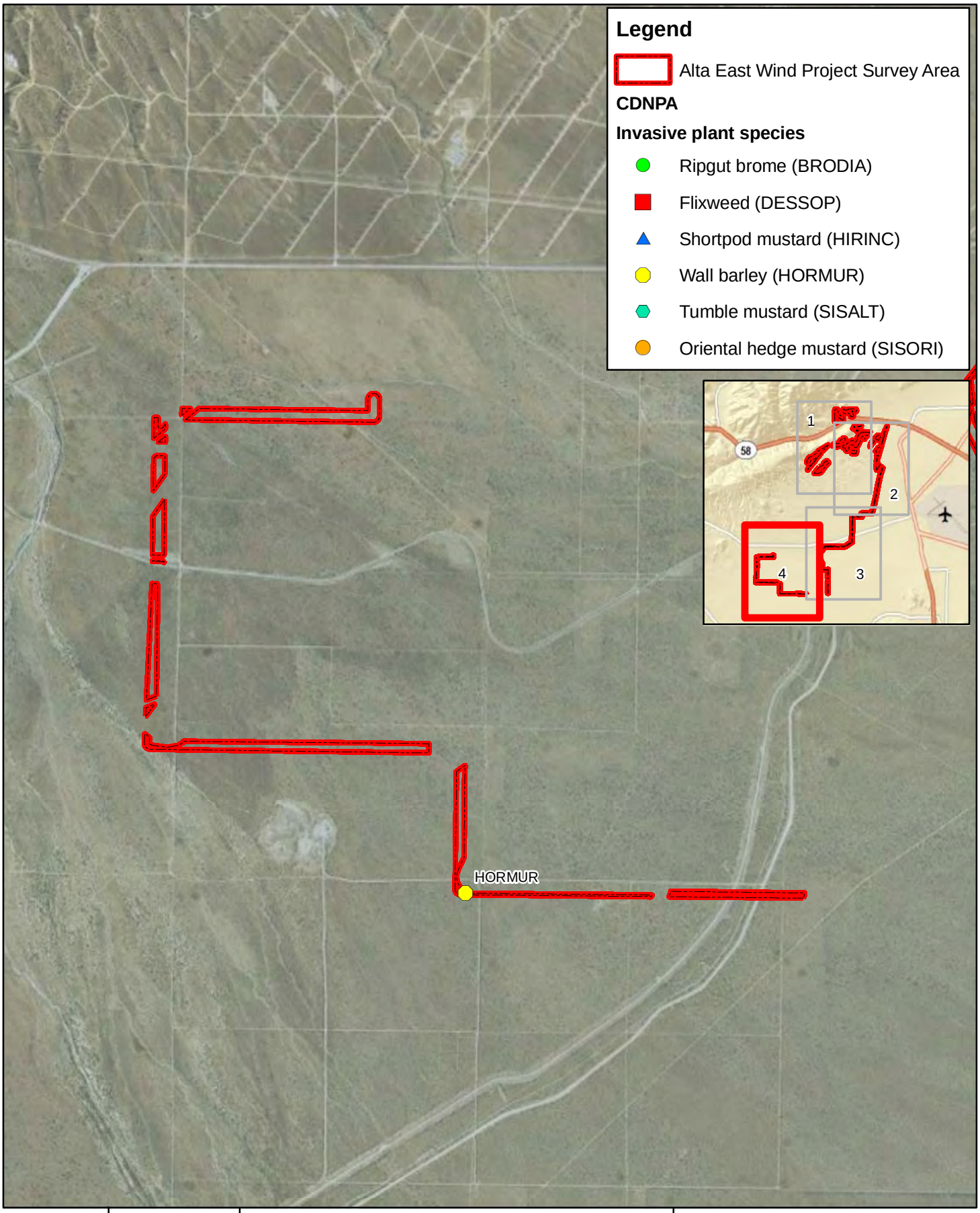
0 1 Kilometers

0 1 Miles

Figure 5. Invasive plant species location map.
Alta East Wind Project

Kern County

June 2011



GANDA

Project Location:

Source: ESRI, World Street Map; GANDA GIS 2011

0 1 Kilometers

0 1 Miles

Figure 5. Invasive plant species location map.
Alta East Wind Project

Kern County

June 2011

4.0 References

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Appendix A

Vascular Plant Species Observed

Scientific Name	Common Name
Gymnosperms	
Cupressaceae	**Cypress family**
Juniperus californica	California juniper
Ephedraceae	**Mormon-tea family**
Ephedra nevadensis	Nevada jointfir
Ephedra viridis	Mormon tea
Dicots	
Apiaceae	**Carrot family**
Lomatium macrocarpum	bigseed biscuitroot
Lomatium mohavense	Mojave desertparsley
Asteraceae	**Aster family**
Acamptopappus sphaerocephalus	rayless goldenhead
Agoseris retrorsa	spearleaf agoseris
Ambrosia dumosa	white bursage
Anisocoma acaulis	scalebud
Calycoseris parryi	yellow tackstem
Chaenactis fremontii	pincushion flower
Chrysothamnus nauseosus	rubber rabbitbrush
Chrysothamnus teretifolius	green Rabbitbrush
Cirsium occidentale var. occidentale	cobwebby thistle
Coreopsis bigelovii	Bigelow's tickseed
Coreopsis calliopsidea	leafstem tickseed
Encelia actonii	Acton's brittlebush
Ericameria cooperi	Cooper's goldenbush
Ericameria linearifolia	narrowleaf goldenbush
Eriophyllum pringlei	Pringle's woolly sunflower
Eriophyllum wallacei	Wallace Eriophyllum
Filago depressa	dwarf cottonrose
Gutierrezia sarothrae	broom snakeweed
Hymenoclea salsola	burrobrush
Lactuca serriola	prickly lettuce
Lasthenia californica	California goldfields
Layia glandulosa	whitedaisy tidytips
Layia heterotricha	paleyellow tidytips
Lepidospartum squamatum	California scale broom
Lessingia filaginifolia	California aster

Scientific Name	Common Name
Lessingia lemmonii	Lemmon's lessingia
Malacothrix coulteri	snake's head
Malacothrix glabrata	smooth desertdandelion
Stephanomeria exigua	small wirelettuce
Stephanomeria pauciflora	brownplume wirelettuce
Syntrichopappus fremontii	yellowray Fremont's-gold
Tetradymia stenolepis	Mojave cottonthorn
Uropappus lindleyi	Lindley's silverpuffs
Xylorhiza tortifolia	Mojave woodyaster
Boraginaceae	**Borage family**
Amsinckia tessellata	bristly fiddleneck
Cryptantha circumscissa	cushion cryptantha
Cryptantha decipiens	gravelbar cryptantha
Cryptantha mohavensis	Mojave cryptantha
Cryptantha nevadensis	Nevada cryptantha
Cryptantha pterocarya	wingnut cryptantha
Cryptantha utahensis	scented cryptantha
Heliotropium curassavicum	salt heliotrope
Pectocarya linearis	sagebrush combseed
Pectocarya penicillata	sleeping combseed
Pectocarya platycarpa	broadfruit combseed
Pectocarya setosa	moth combseed
Plagiobothrys arizonicus	Arizona popcornflower
Brassicaceae	**Mustard family**
Arabis pulchra	beautiful rockcress
Brassica nigra	black mustard
Caulanthus coulteri	Coulter's wild cabbage
Caulanthus inflatus	desert candle
Descurainia pinnata	western tansymustard
Descurainia sophia	herb sophia
Guillenia lasiophylla	California mustard
Lepidium fremontii	desert pepperweed
Sisymbrium altissimum	tall tumblemustard
Sisymbrium orientale	Indian hedgemustard
Stanleya pinnata	desert prince’s plume
Tropidocarpum gracile	dobie pod
Cactaceae	**Cactus family**
Opuntia basilaris var. *basilaris*	beavertail pricklypear
Opuntia echinocarpa	silver cholla
Campanulaceae	**Bellflower family**
Nemacladus orientalis	eastern threadplant

Scientific Name	Common Name
Chenopodiaceae	**Goosefoot family**
Atriplex canescens	fourwing saltbush
Atriplex polycarpa	cattle saltbush
Grayia spinosa	spiny hopsage
Krascheninnikovia lanata	winterfat
Monolepis nuttalliana	Nuttall's povertyweed
Cucurbitaceae	**Cucumber family**
Marah fabaceus	California manroot
Cuscutaceae	**Dodder family**
Cuscuta californica	chaparral dodder
Euphorbiaceae	**Spurge family**
Chamaesyce albomarginata	whitemargin sandmat
Fabaceae	**Pea family**
Astragalus didymocarpus var.	dwarf white milkvetch
Astragalus lentiginosus var. *variabilis*	freckled milkvetch
Astragalus pachypus var. *pachypus*	thickpod milkvetch
Lotus humistratus	foothill deervetch
Lupinus bicolor	miniature lupine
Lupinus concinnus	bajada lupine
Lupinus excubitus	grape soda lupine
Lupinus microcarpus	chick lupine
Trifolium gracilentum	pinpoint clover
Geraniaceae	**Geranium family**
Erodium cicutarium ssp. *cicutarium*	redstem stork's bill
Hydrophyllaceae	**Waterleaf family**
Emmenanthe penduliflora var. *penduliflora*	whisperingbells
Nama demissum	purplemat
Phacelia distans	distant phacelia
Phacelia fremontii	Fremont's phacelia
Phacelia glandulifera	sticky phacelia
Phacelia heterophylla	varileaf phacelia
Phacelia tanacetifolia	lacy phacelia
Lamiaceae	**Mint family**
Salazaria mexicana	Mexican bladdersage
Salvia columbariae	chia
Salvia dorrii	purple sage

Scientific Name	Common Name
Loasaceae	**Loasa family**
Mentzelia albicaulis	whitestem blazingstar
Mentzelia veatchiana	Veatch's blazingstar
Malvaceae	**Mallow family**
Eremalche exilis	white mallow
Sphaeralcea ambigua	desert globemallow
Nyctaginaceae	**Four o'clock family**
Mirabilis bigelovii	wishbone-bush
Onagraceae	**Evening Primrose family**
Camissonia boothii	Booth's evening primrose
Camissonia campestris	Mojave suncup
Camissonia claviformis	browneyes
Camissonia pallida ssp. *pallida*	paleyellow suncup
Camissonia palmeri	Palmer evening primrose
Papaveraceae	**Poppy family**
Eschscholzia minutiflora ssp. *minutiflora*	pygmy golden poppy
Platystemon californicus	creamcups
Polemoniaceae	**Phlox family**
Eriastrum	woollystar
Eriastrum densifolium	giant woollystar
Eriastrum diffusum	miniature woollystar
Gilia brecciarum	Nevada gilia
Gilia capitata	bluehead gilia
Gilia latiflora	hollyleaf gilia
Gilia latifolia	broadleaf gilia
Gilia modocensis	Modoc gilia
Linanthus aureus	golden deserttrumpets
Linanthus parryae	sandblossoms
Loeseliastrum matthewsii	desert calico
Loeseliastrum schottii	Schott's calico
Polygonaceae	**Buckwheat family**
Centrostegia thurberi	red triangles
Chorizanthe brevicornu	brittle spineflower
Chorizanthe watsonii	fivetooth spineflower
Eriogonum angulosum	anglestem buckwheat
Eriogonum deflexum	flatcrown buckwheat
Eriogonum fasciculatum var. *polifolium*	Eastern Mojave buckwheat

Scientific Name	Common Name
Eriogonum gracillimum	rose and white buckwheat
Eriogonum heermannii var. *heermannii*	Heermann's buckwheat
Eriogonum nudum var. *westonii*	Weston's buckwheat
Eriogonum plumatella	yucca buckwheat
Eriogonum pusillum	yellowturbans
Eriogonum trichopes	little deserttrumpet
Eriogonum viridescens	twotooth buckwheat
Mucronea perfoliata	perfoliate spineflower
Portulacaceae	**Purslane family**
Calyptridium monandrum	pussy paws
Claytonia perfoliata	miner's lettuce
Ranunculaceae	**Buttercup family**
Delphinium parishii	desert larkspur
Rosaceae	**Rose family**
Purshia tridentata var. *glandulosa*	antelope brush
Scrophulariaceae	**Figwort family**
Castilleja applegatei ssp. *martinii*	wavyleaf Indian paintbrush
Castilleja chromosa	desert Indian paintbrush
Mimulus bigelovii	Bigelow's monkeyflower
Penstemon incertus	Mojave beardtongue
Solanaceae	**Potato family**
Lycium andersonii	Anderson's box thorn
Lycium cooperi	peach thorn
Zygophyllaceae	**Creosote-bush family**
Larrea tridentata	creosote bush
Monocots	
Agavaceae	**Century-plant family**
Yucca brevifolia	Joshua tree
Yucca whipplei	chaparral yucca
Liliaceae	**Lily family**
Allium fimbriatum var. *fimbriatum*	fringed onion
Calochortus kennedyi var. *kennedyi*	desert mariposa lily
Dichelostemma capitatum	bluedicks
Poaceae	**Grass family**
Achnatherum hymenoides	Indian ricegrass
Achnatherum lemmonii	Lemmon's needlegrass
Achnatherum speciosum	desert needlegrass
Bromus carinatus	California brome
Bromus diandrus	ripgut brome

Scientific Name	Common Name
Bromus madritensis ssp. *rubens*	red brome
Bromus tectorum	cheatgrass
Elymus elymoides	squirreltail
Hordeum murinum ssp. *leporinum*	hare barley
Poa secunda	Sandberg bluegrass
Schismus	Mediterranean grass
Vulpia microstachys	small fescue

Appendix B

Bakersfield cactus locations

(UTM NAD 83 Zone 11S)

Map label	Easting	Northing
OPBAT-1	385465.690	3883834.270
OPBAT-2	385542.720	3883913.360
OPBAT-3	385572.260	3883358.170
OPBAT-4	385574.190	3883359.500
OPBAT-5	385579.350	3883360.230
OPBAT-6	385593.770	3883416.360
OPBAT-7	385606.790	3883374.630
OPBAT-8	385746.130	3884094.310
OPBAT-9	385875.440	3883978.100
OPBAT-10	385935.690	3884005.300
OPBAT-11	385937.960	3884104.940
OPBAT-12	385938.360	3884090.580
OPBAT-13	385951.760	3883795.840
OPBAT-14	385952.530	3883797.270
OPBAT-15	385960.340	3883805.330
OPBAT-16	385974.370	3884265.080
OPBAT-17	385993.270	3883841.040
OPBAT-18	386017.820	3883017.510
OPBAT-19	386018.780	3883033.320
OPBAT-20	386024.000	3883027.490
OPBAT-21	386027.880	3883033.250
OPBAT-22	386028.320	3883022.520
OPBAT-23	386029.070	3884325.200
OPBAT-24	386041.850	3883078.130
OPBAT-25	386042.410	3883016.450
OPBAT-26	386045.710	3883071.680
OPBAT-27	386046.870	3883046.040
OPBAT-28	386086.620	3883992.420
OPBAT-29	386089.170	3883988.900
OPBAT-30	386115.980	3884229.310
OPBAT-31	386146.880	3883149.430
OPBAT-32	386313.900	3884355.820
OPBAT-33	386341.450	3884377.960
OPBAT-34	386356.920	3883393.090
OPBAT-35	386365.550	3884306.810
OPBAT-36	386378.310	3883407.710
OPBAT-37	386398.390	3883455.430
OPBAT-38	386440.760	3884516.320
OPBAT-39	386464.370	3883217.920
OPBAT-40	386465.570	3883216.540
OPBAT-41	386466.730	3883196.790
OPBAT-42	386473.760	3883520.130
OPBAT-43	386486.180	3883222.070
OPBAT-44	386529.630	3883291.700
OPBAT-45	386557.790	3883270.360
OPBAT-46	386608.380	3884633.370

Map label	Easting	Northing
OPBAT-47	386611.970	3883326.960
OPBAT-48	386670.480	3883728.550
OPBAT-49	386673.120	3883729.480
OPBAT-50	386674.620	3884697.140
OPBAT-51	386703.230	3883714.120
OPBAT-52	386712.240	3883564.470
OPBAT-53	386720.290	3883724.630
OPBAT-54	386723.750	3883711.720
OPBAT-55	386725.090	3883706.740
OPBAT-56	386729.710	3883741.170
OPBAT-57	386740.510	3883545.720
OPBAT-58	386777.180	3883565.020
OPBAT-59	386839.010	3883675.480
OPBAT-60	386854.450	3883824.130
OPBAT-61	386866.270	3883801.930
OPBAT-62	386898.210	3883815.150
OPBAT-63	386917.860	3883827.090
OPBAT-64	387398.480	3886801.090
OPBAT-65	387574.650	3886722.350
OPBAT-66	387596.670	3887093.300
OPBAT-67	387618.260	3887150.600
OPBAT-68	387632.680	3884906.040
OPBAT-69	387687.420	3885057.250
OPBAT-70	387788.930	3887004.340
OPBAT-71	387812.910	3886911.260
OPBAT-72	387813.060	3886890.230
OPBAT-73	387818.170	3886947.210
OPBAT-74	387834.640	3886810.460
OPBAT-75	387835.820	3886844.640
OPBAT-76	387838.740	3886743.840
OPBAT-77	387872.760	3884940.800
OPBAT-78	387890.510	3886889.900
OPBAT-79	387902.510	3886768.510
OPBAT-80	387926.160	3885059.490
OPBAT-81	387963.320	3884877.990
OPBAT-82	388011.950	3886795.770
OPBAT-83	388020.000	3886810.540
OPBAT-84	388130.940	3884709.600
OPBAT-85	388146.030	3884695.580
OPBAT-86	388150.020	3884696.660
OPBAT-87	388165.530	3884789.510
OPBAT-88	388187.500	3884669.340
OPBAT-89	388194.460	3884886.780
OPBAT-90	388220.620	3884763.950
OPBAT-91	388236.050	3884786.410
OPBAT-92	388271.530	3884565.970

Map label	Easting	Northing
OPBAT-93	388485.980	3887002.920
OPBAT-94	388526.910	3887003.500
OPBAT-95	388546.160	3887001.810
OPBAT-96	388557.310	3887205.490
OPBAT-97	388562.080	3887002.400
OPBAT-98	388563.470	3886918.660
OPBAT-99	388588.950	3887183.030
OPBAT-100	388596.530	3887010.930
OPBAT-101	388609.480	3887378.180
OPBAT-102	388667.120	3887036.410
OPBAT-103	388712.260	3884467.450
OPBAT-104	388735.530	3884524.570
OPBAT-105	388822.330	3884659.540
OPBAT-106	388843.290	3884811.780
OPBAT-107	388890.260	3884879.540
OPBAT-108	388908.670	3884918.700
OPBAT-109	389008.720	3885200.410
OPBAT-110	389027.580	3885430.550
OPBAT-111	390336.450	3885426.330
OPBAT-112	390346.080	3885421.500

Appendix C

Special-status plant species locations

(UTM NAD 83 Zone 11S)

Species	Map label	Easting	Northing
Pale-yellow layia	LAHE-1	385903.436	3884206.930
Pale-yellow layia	LAHE-2	388460.421	3884893.170
Pale-yellow layia	LAHE-3	389011.556	3885290.620
Adobe yampah	PEPR5-1	385584.882	3883365.160
Adobe yampah	PEPR5-2	385605.042	3883370.310

Appendix D

Morphological characteristics of *Opuntia basilaris* plants occurring in the Project area

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
OPBAT-1	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-2	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-3	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-4	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-5	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-6	Bakersfield	raised	<8	most spines >6mm	>2 in some areoles	most pads w/ >5	no fruits available
OPBAT-7	Bakersfield	raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-8	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-9	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-10	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-11	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-12	Bakersfield	raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-13	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-14	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-15	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-16	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-17	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-18	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-19	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-20	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-21	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-22	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-23	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-24	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-25	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-26	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-27	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-28	Bakersfield	sunken	>8	most spines <6mm	<2 in all areoles	most pads w/ >5	no fruits available
OPBAT-29	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-30	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-31	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-32	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-33	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-34	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-35	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-36	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-37	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-38	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
OPBAT-39	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-40	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-41	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-42	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-43	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-44	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-45	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-46	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-47	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-48	Bakersfield	raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-49	Bakersfield	sunken	>8	most spines <6mm	<2 in all areoles	most pads w/ >5	no fruits available
OPBAT-50	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-51	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-52	Bakersfield	raised	>8	No spines	No spines	No spines	3-10 per upper areole
OPBAT-53	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-54	Bakersfield	flush	>8	most spines >6mm	<2 in all areoles	most pads w/ >5	no fruits available
OPBAT-55	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-56	Bakersfield	flush	>8	most spines <6mm	<2 in all areoles	most pads w/ <5	no fruits available
OPBAT-57	Bakersfield	raised	>8	most spines <6mm	<2 in all areoles	most pads w/ >5	no fruits available
OPBAT-58	Bakersfield	sunken	>8	most spines <6mm	<2 in all areoles	most pads w/ >5	no fruits available
OPBAT-59	Bakersfield	both sunken & flush	>8	most spines <6mm	<2 in all areoles	most pads w/ >5	no fruits available
OPBAT-60	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-61	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-62	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-63	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-64	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-65	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-66	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-67	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-68	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-69	Bakersfield	both sunken & flush	>8	No spines	No spines	No spines	3-10 per upper areole
OPBAT-70	Bakersfield	flush	<8	No spines	No spines	No spines	no fruits available
OPBAT-71	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-72	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-73	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-74	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-75	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-76	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-77	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-78	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-79	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-80	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-81	Bakersfield	raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-82	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
OPBAT-83	Bakersfield	flush	<8	No spines	No spines	No spines	no fruits available
OPBAT-84	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-85	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-86	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-87	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-88	Bakersfield	sunken	>8	No spines	>2 in some areoles	No spines	no fruits available
OPBAT-89	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-90	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-91	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-92	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-93	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-94	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-95	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-96	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-97	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-98	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-99	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-100	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-101	Bakersfield	raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-102	Bakersfield	raised	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-103	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-104	Bakersfield	raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-105	Bakersfield	both flush & raised	>8	No spines	No spines	No spines	no fruits available
OPBAT-106	Bakersfield	sunken	<8	most spines <6mm	<2 in all areoles	most pads w/ >5	no fruits available
OPBAT-107	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-108	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-109	Bakersfield	flush	>8	No spines	No spines	No spines	no fruits available
OPBAT-110	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-111	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
OPBAT-112	Bakersfield	flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	most spines <6mm	<2 in all areoles	most pads w/ <5	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	most spines <6mm	<2 in all areoles	most pads w/ <5	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	1-2 per upper areole

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	Bo	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	1-2 per upper areole
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	most spines <6mm	<2 in all areoles	most pads w/ <5	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	1-2 per upper areole
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	Bo	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	Bo	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	1-2 per upper areol
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	Bo	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	Bo	No spines	No spines	No spines	no fruits available

Map label	Variety	Areoles	Areoles per row	Spine length	Spines per areole	Spines per pad	Spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken&flush&raised	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	both sunken & raise	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no spines on fruit
N/A	Beavertail	sunken	Bo	most spines <6mm	<2 in all areoles	most pads w/ <5	no fruits available
N/A	Beavertail	sunken	>8	most spines <6mm	<2 in all areoles	only 1 on plant	no fruits available
N/A	Beavertail	both sunken & flush	>8	No spines	No spines	No spines	no fruits available
N/A	Beavertail	sunken	>8	No spines	No spines	No spines	no fruits available

Appendix E

Descriptions of special-status plants not observed, but with the potential to occur on the project site

Inyo Onion (*Allium atrorubens* var. *cristatum*)

Inyo onion is a bulbiferous herb in the Lily family (*Liliaceae*) found on sandy and rocky substrates within Joshua Tree Woodland, Mojavean Desert Scrub, and Pinyon and Juniper Woodland communities. Known occurrences range in elevation from 3,960 to 8,448 feet (CNPS 2011). Inyo onion has no State or Federal listing status but is included on CNPS List 4.3, a watch list (ibid.). The BLM designates it as a Plant of Interest (BLM 2010).

In California, Inyo onion has been found in Inyo, Kern, and San Bernardino counties (CNPS 2011). This variety is also known to occur in Nevada. The nearest known location is 42 mi northeast of the Project area in the Owens Peak watershed (CCH 2011).

Although suitable habitat is present, it is unlikely that Inyo onion would occur in the Project area since this variety has not been documented south of the Owens Peak watershed. Botanical surveys conducted by GANDA in April and May, during the flowering period of Inyo onion (April to June), did not detect this species within the survey area. Only one species of *Allium* was detected within the Project area, fringed onion (*A. fimbriatum* var. *fimbriatum*).

Spanish Needle onion (*Allium shevockii*)

Spanish Needle onion is a bulb-forming perennial herb in the Lily family (*Liliaceae)* that is 6-9 inches tall. It has showy flowers, with tepals (petal-like flower parts) that are white to light green below and maroon on the reflexed and curled distal half (Hickman 1993). The flowering time is from May to June (CNPS 2011). Spanish Needle onion is typically found on talus or loose, deep gravel derived from dark-colored granitic or andesitic rock, in Pinyon and Juniper Woodland and Upper Montane Coniferous Forest (CNPS 2011). It ranges in elevation from 2,800 to 8,200 feet (CNPS 2011). Spanish Needle onion has no State or Federal listing status, but is included on CNPS List 1B.3, indicating that it is rare, threatened or endangered in California and elsewhere, with a low threat level in California (ibid.). It is designated by the BLM as a Special-Status species (BLM 2010).

Spanish Needle onion is known only from Kern County, on or near the crest of the southern Sierra Nevada (CNPS 2011). The largest known population, with several thousand individuals, occurs on Spanish Needle Peak (Pitzer 2010). The nearest known location is 8 mi west of the Project area near upper Horse Canyon about 4 miles upstream from Sand Canyon (CNDDB 2011).

No suitable talus slope habitats for Spanish Needle onion occur in the Project area, and the species is unlikely to occur. Surveys conducted by GANDA in May, during the flowering period (April – June), failed to detect the species.

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

California androsace is a white-flowered annual herb in the Primrose Family (Primulaceae). It is the only subspecies of *Androsace elongata* known to occur in California (USFS 2005). It is found in Grassland,

Chaparral, Coastal Sage Scrub, Semi-Desert Shrub, Pinyon and Juniper Woodland, and Cismontane Woodland communities at elevations of 1,000 to 3,940 feet (CNPS 2011). It typically occurs where vegetation cover is low and mesic conditions are present, such as on and adjacent to moss-covered soil or rock outcrops on north-facing slopes or along rocky washes (USFS 2005). It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, California androsace has been found in many counties throughout the state. The nearest known location is 20 mi west of the Project area in the Tehachapi Mountains near Keene Station (CCH 2011).

There is only marginally suitable habitat for California androsace in the Project area. Botanical surveys conducted by GANDA during the flowering period of California Androsace (March to June) did not detect the subspecies within the Project area. However, the subspecies is small and inconspicuous, and it is possible, but unlikely, that it occurs within the Project area.

Horn's milk-vetch (*Astragalus hornii var. hornii*)

Horn's milk-vetch is an annual herb in the Pea family (Fabaceae) found in Meadow and Seep and Playa communities. It is often associated with lake margins and alkaline substrates. It ranges in elevation from 200 to 2,790 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 1B.1, indicating that it is rare, threatened or endangered in California and elsewhere, with a high threat level in California (ibid.).

In California, Horn's milk-vetch has been found in Inyo, Kern, San Bernardino, and Tulare counties. It is also know to occur in Nevada (CNPS 2011). The nearest known location is 15 mi south of the Project area in Willow Springs. (CNDDB 2011).

No suitable mesic alkaline habitats for this species occur in the Project area. The species was not observed in surveys conducted just prior to its flowering period, and no unidentified vegetative *Astragalus* species were observed.

Alkali mariposa-lily (*Calochortus striatus*)

Alkali mariposa lily is a bulbiferous herb in the Lily family found on mesic alkaline substrates within Chaparral, Chenopod Scrub, and Mojave Desert Scrub communities. It is often associated with meadows, seeps and alkali flats. Known occurrences range in elevation from 200 to 5,300 feet. It has no State or Federal listing status, but is included on CNPS List 1B.2, indicating that it is rare, threatened or endangered in California and elsewhere, and fairly endangered in California.

In California, alkali mariposa has been found in Kern, Los Angeles, and San Bernardino and Tulare counties. This species is also known to occur in southern Nevada (CNPS 2011). The nearest known location is 12 mi south of the Project area along Sierra Highway between Sopp Road and Backus Road (CNDDB 2011).

It is unlikely that alkali mariposa lily would occur on the Project area. There are no large alkali flats, seeps or meadows within the Project area, however some of the washes may provide marginal habitat for this species. No occurrences of this species were observed during botanical surveys conducted by GANDA during the flowering period for this species, April to June. Only the common desert mariposa lily (*Calochortus kennedyi*) was observed within the Project area. Alkali mariposa lily can be distinguished in the field from other *Calochortus* species by the distinctive purple veins on the otherwise light pink petals.

Kern County evening-primrose (*Camissonia kernensis* ssp. *kernensis*)
Kern County evening-primrose is an annual herb in the Evening Primrose family (Onagraceae) with small, but conspicuous four petaled yellow flowers. It is typically found in Chaparral, Joshua Tree Woodland, and Pinyon and Juniper Woodland on sandy or gravelly substrates (CNPS 2011). It ranges in elevation from 2,607 to 7,029 feet. It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list.

In California, Kern County evening-primrose is endemic to Kern and Santa Barbara counties (CNPS 2011). In Kern County, most documented occurrences of this subspecies occur in the Scodie Mountain's of the southern Sierra Nevada's near Walker Pass. The nearest known location is 4 mi south of the Project area about 3 miles west of Hwy 14 on Oak Creek Drive (CCH 2011).

Although suitable habitat is present in the Project area within Joshua Tree Woodland, botanical surveys conducted by GANDA during the flowering period of Kern County evening-primrose (March to May) did not detect the subspecies within the Project area. Only the more common species, Booth's evening primrose (*Camissonia boothii*), brown eyes (*Camissonia claviformis*), Mojave suncup (*C. campestris*), Palmer's evening primrose (*C. palmeri*), and pale yellow suncup (*C. pallida*) were observed.

White pygmy-poppy (*Canbya candida*)
White pygmy-poppy is a diminutive annual herb in the Poppy family (Papaveraceae) with small white flowers. It is typically found on gravelly, sandy, and granitic substrates in Joshua Tree Woodland, Mojavean Desert Scrub, and Pinyon and Juniper Woodland from 1,900 to 4,800 ft. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, white pygmy-poppy is known from Imperial, Inyo, Kern, Los Angeles, and San Bernardino counties (CNPS 2011). The nearest known location is 4 mi east of the Project area 2 miles north of Mojave. (CNDDB 2011).

Although suitable habitat for white pygmy-poppy occurs in the Project area within Joshua Tree Woodland, and Creosote Bush Scrub, botanical surveys conducted by GANDA during the flowering period (March to June) did not detect the species. White pygmy-poppy is the only species in the genus *Canbya*, and no similar species were observed.

Mojave paintbrush (*Castilleja plagiotoma*)
Mojave paintbrush is a hemiparasitic perennial herb in the Figwort family (*Scrophulariaceae*). It reaches 40 inches in height, and produces multiple stalks of inconspicuous yellow-green flowers that bloom from April to June (Hickman 1993, CNPS 2011). It is found in Great Basin Scrub, Joshua Tree Woodland, Lower Montane Coniferous Forest, and Pinyon and Juniper Woodland communities, often on alluvial soils (CNPS 2011). It is reported at elevations ranging from 900 to 8,000 feet (ibid.). Mojave paintbrush has no State or Federal listing status, but is included on CNPS List 4.3, a watch list (ibid.).

Mojave paintbrush is endemic to California, and has been reported in Los Angeles, San Bernardino, San Luis Obispo, Kern, Santa Barbara, San Benito, Fresno, Ventura, and Riverside counties (CCH 2011). This species has been observed by GANDA to occur in the greater AOCM Project area, but does not occur in the current project.

Although suitable habitat for Mojave paintbrush occurs in the Project area within Joshua Tree Woodland, California Juniper Woodland, and Creosote Bush Scrub, botanical surveys conducted by GANDA during the flowering period did not detect the species.

Death Valley sandmat (*Chamaesyce vallis-mortae*)

Death Valley sandmat is a perennial prostrate herb in the Spurge family (Euphorbiaceae). It is typically found in Mojavean Desert Scrub habitats on sandy or gravelly substrates (CNPS 2011). Known occurrences range in elevation from 760 to 4,800 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, Death Valley sandmat is known from Inyo, Kern, and San Bernardino counties in the Mohave Desert (CNPS 2011). The closest known location to the Project area is near the Kelso Valley about 15 miles northeast of the Project area (E. Kentner pers. obs.)

Although suitable habitat for Death Valley sandmat occurs in the Project area within Creosote Bush Scrub, botanical surveys conducted by GANDA outside of the flowering period of Death Valley sandmat (May to October) did not detect the species within the Project area. This species was observed to be easily detectable at a reference population located about ten miles north of the Project area on May, 3, 2011. Only the common species white margin sandmat (*Chamaesyce albomarginata*) was observed in the Project area.

Mojave spineflower (*Chorizanthe spinosa*)

Mojave spineflower is an annual herb in the Knotweed family (Polygonaceae) that has inconspicuous flowers that are only 3 mm long. There are generally five bracts per flower, with one bract much longer than the others. It is typically found in Chenopod Scrub, Joshua Tree Woodland, and Mojavean Desert Scrub habitat. (CNPS 2011). Known occurrences range in elevation from 20 to 4,290 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, Mojave spineflower is endemic the west Mohave Desert within Kern, Los Angeles, and San Bernardino counties (CNPS 2011). The nearest known location is 5 mi southeast of the Project area in Mohave (CCH 2011).

Only marginal habitat for Mojave spineflower occurs in the Project area on moderately alkaline soils. Botanical surveys conducted by GANDA during the flowering period of Mojave spineflower, March to July, did not detect the species within the Project area. Only the more common species, brittle spineflower (*Chorizanthe brevicornu*) and fivetooth spineflower (*C. watsonii*) were observed.

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

Kern Canyon clarkia is an annual herb in the Evening Primrose family with conspicuous four petaled pink flowers that are notched at the tip. It is typically found in Chaparral, Cismontane Woodland, Great Basin Scrub, and Valley and Foothill Grassland habitats, often on sandy, sometimes rocky slopes (CNPS 2011). It ranges in elevation from 2,310 to 11,950 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, Kern Canyon clarkia is endemic to Inyo, Kern, Los Angeles, and Tulare counties (CNPS 2011). In Kern County, all known occurrences of this subspecies occur in the southern Sierra Nevada. The nearest known location is 26 mi northwest of the Project area about 2 mi west of Kelso Valley Road, off of the road to Piute Mountain (CNDDB 2011).

Very little marginally suitable habitat for this species is present in the Project area. Botanical surveys conducted by GANDA during the flowering period of Kern Canyon clarkia (May to June) did not detect the subspecies within the Project area. No *Clarkia* species were observed during the surveys.

Short-bracted bird's-beak (*Cordylanthus rigidus* ssp. *brevibracteatus*)
Short-bracted bird's-beak is a many branched annual species in the Figwort family that is found in the southern Sierra Nevada floristic province (Hickman 1993). It occurs in the understory and in granitic openings within Chaparral, Lower and Upper Montane Coniferous Forest, Pinyon and Juniper Woodland vegetation communities at elevations between 3,000 and 7,000 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list.

Short-bracted bird's beak is endemic to California. It has been reported to occur in Kern, Tulare, Fresno and Mariposa counties. The nearest known location is 12 mi west of the Project area in Antelope Canyon south of Tehachapi (CCH 2011).

Little suitable habitat for short-bracted bird's beak occurs in the Project area. Surveys conducted by GANDA from April to May did not detect any *Cordylanthus* species. Although, short-bracted bird's beak blooms from July to August, vegetative individuals would have been detectable at the time of the surveys. It can be can be distinguished from the common rigid bird's beak (*Cordylanthus rigidus* ssp. *rigidus*) by the conspicuously shorter length of the flower bracts subtending the flowers as compared to flower bracts that are as large or larger than the flowers (Hickman 1993).

Mojave tarplant (*Deinandra mohavensis*)
Mojave tar plant is an annual tar plant in the Sunflower family with sessile clusters of small yellow flowers. It grows to a height of approximately 36 inches tall, and is typically found in Chaparral, Coastal Scrub, Riparian Scrub and mesic community types, in washes or around springs at elevations between 1,800 and 4,000 feet (CNPS 2011). It is State listed and Endangered, has no Federal listing status, and is included on CNPS List 1B.3, indicating that it is rare, threatened or endangered in California and elsewhere, but not very endangered in California.

In California, Mojave tar plant is known to occur in Kern, San Bernardino, Riverside, and San Diego counties. The closest known occurrence of Mojave tar plant is over 20 miles north of the Project area near a spring on Mount Cross in Jawbone Canyon (CCH 2011). There are other known occurrences in Kelso Valley, over 20 miles north of the Project area. These occurrences were found in drainages and on low hillslopes near drainages on granitic substrate within a recent burn (CCH 2011).

Suitable habitat for this species occurs on the Project area in washes and/or drainages. Botanical surveys conducted by GANDA in May did not detect any species of the genus on the Project area. However, the flowering time for Mojave tar plant is from June to September, and although it is unlikely to occur, additional surveys are required to rule out its presence.

Gypsum-loving larkspur (*Delphinium gypsophilum* ssp. *gypsophilum*)
Gypsum-loving larkspur is a showy 15 to 40 inch tall perennial larkspur in the Buttercup family with a central stalk of dense white flowers. Habitat for the species includes Chenopod Scrub, Cismontane Woodland and Valley and Foothill Grassland plant community types (CNPS 2011) at elevations up to 6,000 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

Gypsum-loving larkspur is endemic to California and has been reported in Alameda, Fresno, Kings, Kern, Madera, Merced, Monterey, San Benito, San Joaquin, San Luis Obispo, Stanislaus, and Ventura counties. It is reported to occur in the Southern Sierra and Tehachapi Floristic provinces. The occurrences of gypsum-loving larkspur in the Tehachapi area are on open hill slopes often associated with "light colored soils", most likely derived from calcareous substrates (CCH 2011). The nearest known location is 3 mi west of the Project area on the north slope of Tehachapi Pass (CCH 2011).

Potential habitat for gypsum-loving larkspur is present within the Project area, but the species was not found during surveys conducted by GANDA during the flowering period from February to May. Only one other larkspur species was found in the Project area, desert larkspur (*Delphinium parishii*). Gypsum-loving larkspur can be distinguished from the other larkspur species of the region by its pinkish white flowers, as compared to the lighter blue flowers of desert larkspur (Hickman 1993).

Mt. Pinos larkspur (*Delphinium parryi* ssp. *purpureum*)

Mt. Pinos larkspur is a 10 to 36 inch tall perennial larkspur in the Buttercup family (Ranunculaceae) with one to several flowering stalks of deep purple to light blue flowers. It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list. It is found within the Chaparral, Mojavean Desert Scrub, Pinyon and Juniper Woodland plant community types at elevations between 3,000 and 8,000 feet (CNDDB 2011).

Mt. Pinos larkspur is endemic to California and is reported to occur in Kern, Santa Barbara and Ventura counties. It is likely that this species is more wide spread than reported, as it was observed to occur in the greater ACOM Project area in surveys conducted in 2010. There are many records of *Delphinium parryi* near the Project area for which the subspecies is not noted (CCH 2011).

Only marginally suitable habitat for this species occurs within the Project survey area, and only the closely related common species desert larkspur (*Delphinium parishii*) was observed during the surveys. However, the surveys were conducted prior to the flowering period of Mt. Pinos larkspur, and additional surveys for this species are planned.

Limestone dudleya (*Dudleya abramsii ssp. calcicola*)

Limestone dudleya is a perennial herb in the Stonecrop family (Crassulaceae) with fleshy leaves in a basal rosette. It is typically found in Chaparral and Pinyon and Juniper Woodland on carbonate substrates (CNPS 2011). It ranges in elevation from 1,640 to 8,528 feet. It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list.

Limestone dudleya is endemic to California and has been found in Inyo, Kern, and Tulare counties (CNPS 2011). The nearest known location is 17 mi northwest of the Project area about 1.5 mi north of Twin Oaks in the southern Piute Mtns (CCH 2011).

Although suitable habitat for this species is present in the Project area, botanical surveys conducted by GANDA during the flowering period of limestone dudleya (April to August) did not detect the species within the Project area. No species of this genus were observed.

Hoover's eriastrum (*Eriastrum hooveri*)

Hoover's eriastrum is an annual herb in the Phlox family (Polemoniaceae) found in Chenopod Scrub, Pinyon and Juniper Woodland, and Valley and Foothill Grassland communities (CNPS 2011). It ranges in elevation from 160 to 3,000 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, Hoover's eriastrum has been found in Fresno, Kings, Kern, Los Angeles, Santa Barbara, San Benito, and San Luis Obispo counties and is considered a Californian endemic. The nearest known location is 22 mi south of the Project area on the southwest edge of Rosamond Dry Lake (CCH 2011).

Marginally suitable habitat for this species is present in the Project area, but the species was not observed in surveys conducted during the flowering period. However, many vegetative *Eriastrum* plants were

observed in the project area during the surveys, and a additional surveys are planned to identify all species of this genus that occur in the Project.

Tracy's eriastrum (*Eriastrum tracyi*)

Tracy's eriastrum is an annual species in the Phlox family that is up to 20 cm in height with small, generally blue flowers. It is primarily known to occur in Chaparral and Cismontane vegetation types, at elevations between 1,040-3,220 feet (CNPS 2011). Tracy's eriastrum has recently been resurrected as a species (Gowen 2008). It was first described by Mason (1945), and later combined with Brandegee's eriastrum in the Jepson manual (Hickman 1993). It is State listed as rare, has no Federal listing status, and is included on CNPS List 1B.2, indicating that it is rare, threatened or endangered in California and elsewhere, and fairly endangered in California.

Recent investigations of herbarium records have determined that six records of Great Basin woollystar (*E. sparsiflorum*) within Kern County are actually Tracy's eriastrum. The nearest known location is 12 mi north of the Project area about 1.5 miles northeast of Emerald Mountain (CNDDB 2011).

Although suitable habitat is present in the Project area, botanical surveys conducted by GANDA occurred outside of the flowering period of Tracy's eriastrum. Because annual *Eriastrum* species are extremely difficult to identify when not in flower, additional late-season surveys are required to rule out the presence of this species in the Project area.

White-flowered rabbitbrush (*Ericameria albida*)

White-flowered rabbitbrush is a perennial shrub in the Sunflower family, with white flowers and green, gland dotted herbage (Hickman 1993). It is associated with Chenopod Scrub and Alkaline Playa plant community types, often around meadows and seeps at elevations between 900 and 6,000 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

White-flowered rabbitbrush is found in Utah, Nevada and California and is locally rare in California. It has only been reported in Inyo, Kern, Mono and San Bernardino counties. The nearest known location is 50 mi northeast of the Project area in Indian Wells Valley (CCH 2011).

White-flowered strongly associated with alkaline soils and would not be expected to occur out of this habitat (Hickman 1993). Suitable habitat is present on the Project area in a few alkaline areas, but this habitat is very limited and it is unlikely that this species would occur. White-flowered rabbitbrush can be distinguished from other species of rabbitbrush by its distinctive white flowers that bloom from June to November. Four other species of *Ericameria* (=*Chrysothamnus*) were found on the Project area.

Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*)

Kern buckwheat is a perennial mat forming buckwheat in the Knotweed family. It occurs in Chaparral and Pinyon and Juniper Woodland at elevations between 6,000 ft and 6,100 ft (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 1B.1, indicating that it is rare, threatened or endangered in California and elsewhere, and seriously endangered in California.

Kern buckwheat is only known from Sweet Ridge and Pine Tree Canyon in Kern County, California (CCH 2011). Sweet Ridge is located approximately 14 mi northeast of the Project area. Pine Tree Canyon is located approximately 12 miles north of the Project area.

No suitable habitat for this species is present in the Project area, and botanical surveys conducted by GANDA outside of the flowering period (May to June) did not detect the species. The only perennial *Eriogonum* species observed were Eastern Mojave buckwheat (*E. fasciculatum* var. *polifolium*), yucca

buckwheat (*E. plumatella*), and Heerman's buckwheat (*E. heermannii*). None of the observed perennial species have a growth form similar to Kern buckwheat.

Barstow woolly sunflower (*Eriophyllum mohavense*)

Barstow woolly sunflower is an annual herb 1-2 inches tall in the Sunflower family. It is typically found in Chenopod scrub, Mojavean desert scrub and Playas from 1,600 to 3,200 ft in elevation (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 1B.2, indicating that it is rare, threatened or endangered in California and elsewhere, and fairly endangered in California.

In California, the Barstow woolly sunflower is known from Fresno, Kern, Los Angeles, and San Bernardino counties (CNPS 2011). The nearest occurrence to the Project area is approximately 20 miles to the east on Edwards Air force Base. This occurrence was found on clay swales and abraded areas within Chenopod scrub (CCH 2011).

Marginal habitat for Barstow woolly sunflower occurs in the Project area, but the species is not known to occur west of Edwards Air Force Base. Barstow woolly sunflower was not observed during the botanical inventory conducted by GANDA during the flowering period (March to May).

Inland gilia (*Gilia interior*)

Inland gilia is an annual herb in the Phlox family with small purple flowers with yellow throats. It is typically found in Cismontane Woodland, Joshua Tree Woodland, and Lower Montane Coniferous Forest on rocky substrates (CNPS 2011). Known occurrences range in elevation from 2,296 to 5,576 feet. It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list.

In California, inland gilia is endemic to Kern and Tulare counties (CNPS 2011). The nearest known location is 23 mi south of the Project area west of Lancaster at 125th St. and Hwy 138 (CCH 2011).

Although suitable habitat is present in the Project area within Joshua Tree Woodland, botanical surveys conducted by GANDA during the flowering period of inland Gilia (March to May) did not detect the species. Several more widespread species on *Gilia* were observed.

Cuyama gilia (*Gilia latiflora ssp. Cuyamensis*)

Cuyama gilia is an annual herb in the Phlox family (Polemoniaceae) found in Pinyon and Juniper Woodland communities. It is often associated with sandy substrates (CNPS 2011). It ranges in elevation from 1,970 to 6,560 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list.

In California, Cuyama gilia has been found in Kern, Los Angeles, Santa Barbara, San Luis Obispo, and Ventura counties (CNPS 2011). The nearest known location is 33 mi south of the Project area in the vicinity of Ritter Ridge on the south side of the Antelope Valley (CCH 2011).

Although suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period of Cuyama Gilia (April to June) did not detect the species. Several more widespread species on *Gilia* were observed.

Golden goodmania (*Goodmania luteola*)

Golden goodmania is a small, spreading annual herb in the Knotweed family that is thinly hairy throughout and has small yellow flowers. It is typically found in Mojavean Desert Scrub, Meadows and Seeps, Playas, and Valley and Foothill Grassland on alkaline or clay substrates (CNPS 2011). Known

occurrences range in elevation from 65 to 7,216 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, golden goodmania has been found in Fresno, Inyo, Kern, Los Angeles, Madera, Mono, and Tulare counties (CNPS 2011). The nearest known location is 21 mi east of the Project area 8 mi north of Muroc (CCH 2011).

Marginal habitat for golden goodmania occurs in the Project area, but botanical surveys conducted by GANDA during the flowering period of golden goodmania (April to August) did not detect the species within the Project area. No similar species were observed.

Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)

Coulter's goldfields is an annual herb in the Sunflower family with yellow-orange flowers. It is typically found in Coastal Salt Marshes and Swamps, Playas, and Vernal Pools, often in saline environments (CNPS 2011). It ranges in elevation from sea level to 4,000 feet. It has no State or Federal listing status, but is included on CNPS List 1B.1, indicating that it is rare, threatened or endangered in California and elsewhere, and seriously endangered in California.

In California, Coulter's goldfields has been found in Colusa, Kern, Los Angeles, Merced, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, Tulare, and Ventura counties (CNPS 2011). The nearest known location is 12 mi west of the Project area in Tehachapi (CNDDB 2011).

Only a small amount of marginally suitable habitat for Coulter's goldfields is present within the Project area. Botanical surveys conducted by GANDA during the flowering period of Coulter's goldfields, (February to June) did not detect the species. Only the common California goldfields (*L. californica*) was observed within the Project area during surveys. This species is distinguished from Coulter's goldfields by having free phyllaries and hairy leaves.

Sagebrush loeflingia (*Loeflingia squarrosa var. artemisiarum*)

Sagebrush loeflingia is an annual herb in the Pink family (Caryophyllaceae) that is generally under 7 cm tall. It is typically found in desert Dunes, Great Basin Scrub, and Sonoran Desert Scrub in sandy habitats (CNPS 2011). Known occurrences range in elevation from 2,310 to 5,330 feet. It has no State or Federal listing status, but is included on CNPS List 2.2, indicating that it is rare, threatened or endangered in California, but more common elsewhere.

In California, sagebrush loeflingia is found in Inyo, Kern, Lassen , Los Angeles , Plumas, and San Bernardino counties. It is also found in Nevada, Oregon, and Wyoming (CNPS 2011). The nearest known location is 10 mi southeast of the Project area northeast of Acton (CNDDB 2011).

Although marginally suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period of sagebrush Loeflingia (April to May) did not detect the species. No similar-appearing species were observed.

Solitary blazing star (*Mentzelia eremophila*)

Solitary blazing star is an annual herb in the Loasa family (Loasaceae). It is typically found in Mojavean Desert Scrub communities in canyons, washes, and on rocky slopes within the western Mojave Desert region (CNPS 2011). Known occurrences range in elevation from 2,310 to 4,025 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, solitary blazing star is endemic to Inyo, Kern, and San Bernardino counties (CNPS 2011). The nearest known location is 9 mi north of the Project area on the east side of Barren Ridge, about 7.5 mi northwest of California City (CCH 2011).

Although some suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period of solitary blazing star (March to May) did not detect the species within the Project area. Only the widespread species whitestem blazingstar (*M. albicaulis*) and Veatch's blazingstar (*M. veatchiana*) were observed in the Project area. Solitary blazing star is readily distinguishable from the observed common species by its larger flower size (12-24 millimeters).

Sylvan microseris (*Microseris sylvatica*)

Sylvan microseris is a perennial herb in the Sunflower family. It is typically found in Chaparral, Cismontane Woodland, Great Basin Scrub, Pinyon and Juniper Woodland, and Valley and Foothill Grassland habitats (CNPS 2011). Known occurrences range in elevation from 150 to 4,950 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, sylvan microseris has a broad distribution, occurring in 20 counties from southern California to northern California, including the western Mojave Desert (CNPS 2011). The nearest known location is 12 mi west of the Project area in Tehachapi (CCH 2011).

Although some suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period of sylvan Microseris (March to June) did not detect the species within the Project area. No species of *Microseris* were observed.

Calico monkeyflower (*Mimulus pictus*)

Calico monkeyflower is an annual herb in the Figwort family. It is typically found in Broadleafed Upland Forest and Cismontane Woodland habitats within granitic or disturbed areas (CNPS 2011). It ranges in elevation from 330 to 4,290 feet. It has no State or Federal listing status, but is included on CNPS List 1B.2, indicating that it is rare, threatened or endangered in California and elsewhere, and fairly endangered in California.

In California, calico monkeyflower is endemic to Kern and Tulare counties (CNPS 2011). The nearest known location is 6 mi northwest of the Project area near a tributary to Cache Creek/Sand Canyon, northeast of Monolith (CNDDB 2011).

No suitable habitat for this species occurs in the project area, and botanical surveys conducted by GANDA during the flowering period (March to May) did not detect the species. No species of monkeyflower were observed within the Project area.

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

Tehachapi monardella is a perennial herb in the Mint family (Lamiaceae) with bracted heads of whitish, lavender, or pale purple flowers. Tehachapi monardella has no State or Federal listing status, but is included on CNPS List 1B.3, indicating that it is "rare, threatened or endangered in California and elsewhere", but is "not very endangered in California" (CNPS 2011).

Typical habitats include Lower Montane Coniferous Forest, Upper Montane Coniferous Forest, and Pinyon and Juniper Woodland, where it is found on dry slopes with decomposed granitic soils, and in roadside disturbed areas at elevations between 5,560 and 8,100 feet (CNDDB 2011). The nearest known location is 8 mi north of the Project area about 0.8 mi SE of Cache Peak (CCH 2011)

Botanical surveys conducted by GANDA prior to the flowering period of Tehachapi monardella (June to August) did not detect the species. Although the surveys were conducted outside of the flowering period, the species is a perennial and should have been easily detectable at the time of the surveys. This species has been documented to occur in the greater ACOM Project area, but only marginally suitable habitat exists within the Alta East botanical survey area.

Crowned muilla (*Muilla coronata*)

Crowned muilla is a small 3-15 cm tall bulbiferous herb in the Lily family. It typically occurs in Joshua Tree Woodland, Pinyon and Juniper Woodland, and Mojavean Desert Scrub, most often on barren flats and ridges in sandy, granitic soils (CNPS 2011; CNDDB 2011). Known occurrences range in elevation from 3280 to 5250 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

In California, crowned muilla is known from Inyo, Kern, Los Angeles, San Bernardino, and Tulare counties. The nearest known location is 7 mi west of the Project area off of Oak Creek Rd., 9 mi west of Mojave (CCH 2011).

Although suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period (March to April) did not detect the species. No similar species were observed to occur within the Project area.

Piute Mountains navarretia (*Navarretia setiloba*)

Piute Mountains navarretia is an annual herb in the Phlox family. It is typically found in Cismontane Woodland, Pinyon and Juniper Woodland, and Valley and Foothill Grassland habitats in clay or gravelly loam substrates (CNPS 2011). Known occurrences range in elevation from 1,000 to 6,930 feet. It has no State or Federal listing status, but is included on CNPS List 1B.1, indicating that it is rare, threatened or endangered in California and elsewhere, and seriously endangered in California.

In California, Piute Mountains navarretia is endemic to Kern, Los Angeles, and Tulare counties (CNPS 2011). The nearest known location is 24 mi northwest of the Project area on Piute Mountain Road, <3 miles from the Caliente Bodfish Road (CNDDB 2011).

Although some suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period of Piute Mountains Navarretia (April to July) did not detect the species within the Project area. No species of this genus were observed.

Slender threadplant (*Nemacladus gracilis*)

Slender threadplant is an annual herb in the Bellflower family (Campanulaceae). It is typically found in Cismontane Woodland and Valley and Foothill Grassland habitats on sandy or gravelly substrates (CNPS 2011). It ranges in elevation from 400 to 6,270 feet. It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list.

In California, slender threadplant is endemic to Fresno, Kings, Kern, Los Angeles, and Merced counties (CNPS 2011). The nearest known location is 9 mi west of the Project area in Oak Creek Canyon, 1.8 miles southwest of intersection of Oak Creek Rd and Tehachapi Willow Springs Rd (CCH 2011).

Although some suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period of slender threadplant (March to May) did not detect the species within the Project area. Only the more widespread species eastern threadplant (*N. orientalis*) was observed.

Large-flowered nemacladus (*Nemacladus secundiflorus var. secundiflorus*)
Large-flowered nemacladus is an annual herb in the Bellflower family (Campanulaceae) found in Chaparral and Valley and Foothill Grassland communities. It ranges in elevation from 650 to 6,500 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 4.32, a watch list.

In California, large-flowered nemacladus has been found in Kern, Monterey, San Luis Obispo, and Tulare counties (CNPS 2011). The nearest known location is 45 mi north of the Project area on Greenhorn Mountain (CCH 2011).

Although some suitable habitat is present in the Project area, botanical surveys conducted by GANDA during the flowering period of large-flowered nemacladus (April to June) did not detect the species within the Project area. Only the more widespread species eastern threadplant (*N. orientalis*) was observed.

Fragile pentachaeta *(Pentachaeta fragilis)*
Fragile pentachaeta is a diminutive 2 to 6-inch tall annual herb in the Sunflower family (*Asteraceae*). It has alternate leaves that are ciliate on the edges and yellow flower heads with 7-12 ray flowers (Hickman 1993). Fragile pentachaeta flowers from March to June (CNPS 2011). It grows in Chaparral, Foothill Grasslands and Lower Montane Coniferous Forest communities, in loose sandy or loamy soils (CNPS 2011, Hickman 1993). Known occurrences of fragile pentachaeta range in elevation from 100 to 7,000 feet. Fragile pentachaeta has no State or Federal listing status, but is included on CNPS List 4.3, a watch list (CNPS 2011).

Fragile pentachaeta is endemic to California, and has been reported in Kern, Madera, Merced, Monterey, Santa Barbara, San Luis Obispo, Tuolumne, Ventura and Los Angeles counties (CNPS 2011). The nearest known location is 17 mi north of the Project area in the Kelso Valley (CCH 2011).

Although marginally suitable habitat for this species is present in the Project area, the species was not observed during botanical surveys conducted by GANDA during the flowering period. No similar species were observed.

Hubby's phacelia (*Phacelia cicutaria* var. *hubbyi*)
Hubby's phacelia is a 5 to 30 inch tall annual herbaceous plant in the Waterleaf family with white to lavender colored flowers clustered in dense cymes (Hickman 1993). It is typically found in Chaparral, Coastal Scrub and Valley and Foothill Grassland plant community types, most often on gravelly, rocky, and talus slopes (CNPS 2011; Hickman 1993). It ranges in elevation from sea level to 3,300 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

Hubby's phacelia is endemic to California and has been reported to occur in Los Angeles, Ventura, Santa Barbara, Kern and Orange counties (CNPS 2011). The nearest known location is 17 mi north of the Project area near Jawbone canyon (CCH 2011).

Although suitable habitat for this species is present in the Project area, the species was not observed during botanical surveys conducted by GANDA during the flowering period (April to June). Several other species of *Phacelia*, including distant phacelia (*Phacelia distans*), which has shorter straight calyx lobes, were observed on the Project area. Hubby's phacelia can be distinguished from other varieties of caterpillar phacelia (*P. cicutaria*) by its continuously dense inflorescence and by the shaggy/wavy hairs on the calyx or outer flower parts.

Transverse Range phacelia (*Phacelia exilis*)
Transverse Range phacelia is a lavender-flowered annual herb in the Waterleaf family, found in Lower and Upper Montane Coniferous Forest communities. It is often associated with meadows, seeps, pebble plains, and sandy and gravelly substrates. It ranges in elevation from 3,630 to 8,910 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list (ibid.).

Transverse Range phacelia is endemic to California, where it has been found in Kern, Los Angeles, San Bernardino, Tulare, and Ventura counties (CNPS 2011). The nearest known location is 24 mi northwest of the Project area to the southeast of Piute Peak (CCH 2011).

No suitable habitat for Transverse Range phacelia is present in the Project area and it is unlikely this species occurs there. It was not detected in botanical surveys conducted by GANDA during the flowering period of this species (May to August). Several other *Phacelia* species observed in the study area (Appendix A). Transverse Range phacelia can be distinguished from the other *Phacelia* species observed in the Project area by flower color, growth form, or seed characteristics.

Charlotte's phacelia (*Phacelia nashiana*)
Charlotte's phacelia is an annual herbaceous plant in the Waterleaf family. It is typically found on granitic, rocky or sandy substrates in Joshua Tree Woodland, Mojavean Desert Scrub, and Pinyon and Juniper Woodland. Known occurrences range in elevation from 1,900 to 7,300 feet. It has no State or Federal listing status, but is included on CNPS List 1B.2, indicating that it is rare, threatened or endangered in California and elsewhere, and fairly endangered in California.

In California, Charlotte's phacelia is known from Inyo, Kern, and Tulare counties (CNPS 2011). The nearest known location is 9 mi northeast of the Project area on an east slope of Barren Ridge, about 4.5 miles southwest of the mouth of Pine Tree Canyon (CNDDB 2011).

Although suitable habitat for this species is present in the Project area, the species was not observed during botanical surveys conducted by GANDA during the flowering period (March to June). Several other *Phacelia* species observed in the study area (Appendix A). Charlotte's phacelia can be distinguished from the observed *Phacelia* species by its larger bright blue flowers.

Mojave indigo-bush (*Psorothamnus arborescens* var. *arborescens*)
Mojave indigo-bush is a perennial shrub in the Pea family that grows up to 3.5 feet tall and has deep purple or indigo flowers and ½ inch long gland dotted fruits (Hickman 1993). It is typically found in Mojavean Desert Scrub and Riparian Scrub plant community types on stony flats and granitic bedrock (CNPS 2011). It has been reported to occur at elevations between 1,200 and 4,000 feet (CCH 2011; CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 4.3, a watch list.

In California, Mojave indigo-bush has been reported from Kern, Inyo, and San Bernardino counties and also in the Sonora desert in Mexico (CNPS 2011). The nearest known location is 24 mi north of the Project area in Red Rock Canyon (CCH 2011).

Although suitable habitat for this species is present in the Project area within Creosote Bush Scrub, the species was not observed during botanical surveys conducted by GANDA during the flowering period (April to May). No species of *Psorothamnus* were observed during the surveys.

Mojave fish-hook cactus (*Sclerocactus polyancistrus*)
Mojave fish-hook cactus is a small cylindrical (4-12 inch tall by 2-3 inch wide), unbranched, cactus with clusters of 9-11 hooked spines and rose to magenta colored flowers (Hickman, 1993). It is typically

found in Joshua Tree Woodland, Great Basin Scrub, and Mojavean Desert Scrub plant community types on well-drained soil, rocky gravelly mesas, slopes and outcrops, often of calcareous substrate (CNPS 2011). It has been reported to occur at elevations between 1,800 and 7,500 feet. It has no State or Federal listing status, but is included on CNPS List 4.2, a watch list.

Mojave fish-hook cactus has been reported in the following California counties; Inyo, Kern, and San Bernardino (CNPS 2011). The nearest known location is 25 mi north of the Project area in Red Rock Canyon (CCH 2011).

Although suitable habitat for this species is present in the Project area within Creosote Bush Scrub and Joshua Tree Woodland, the species was not observed during botanical surveys conducted by GANDA during the flowering period (April to July). No species of *Sclerocactus* were observed during the surveys.

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

Piute Mountains jewel-flower is a 6 inch to 2.5 foot tall perennial herbaceous plant in the Mustard family (Brassicaceae) with clusters of thick obovate basal leaves, and clasping lanceolate upper leaves with few to many stalks of ½ inch long purple flowers that can have green or yellow sepals or outer petals (Hickman, 1993). Piute Mountains jewel-flower is known to occur in Broadleafed Upland Forests, Closed-Cone Coniferous Forest, and Pinyon and Juniper Woodland plant community types along roadbanks, cliffs, rock outcrops, and sometimes on metamorphic-red clay soils. Known occurrences range in elevation from 1,000 to 6,500 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 1B.2, indicating that it is rare, threatened or endangered in California and elsewhere, and fairly endangered in California.

Piute Mountains jewel-flower is endemic to California and has only been reported in Kern County. The nearest known location is 7 mi northwest of the Project area on Sweetwater Ridge southeast of Cache Peak (CNDDB 2011).

Only marginally suitable habitat for this species is present in the Project area, and the species was not observed during botanical surveys conducted by GANDA during the flowering period (May to July). No species of *Streptanthus* were observed during the surveys.

Golden violet (*Viola purpurea* ssp. *aurea*)

Golden violet is a perennial herb in the Violet family (Violaceae) with golden yellow flowers. It is typically found on sandy substrates in Great Basin Scrub and Pinyon and Juniper Woodland habitats. Known occurrences range in elevation from 3,200 to 6,700 feet (CNPS 2011). It has no State or Federal listing status, but is included on CNPS List 2.2, indicating that it is rare, threatened or endangered in California, but more common elsewhere.

In California, golden violet is known is known to occur in Kern, Lassen, Los Angeles, Mono, San Bernardino, San Diego, and Sierra counties. This species is also known to occur in Nevada (CNPS 2011). There are only two CNDDB occurrence records for this species in Kern County, an older record from "Mojave Station", and another from the Temblor Range on the western side of the San Joaquin Valley, more than 70 miles from the Project area.

No suitable habitat for this species is present in the Project area, and the species was not observed during botanical surveys conducted during the flowering period of April to June.

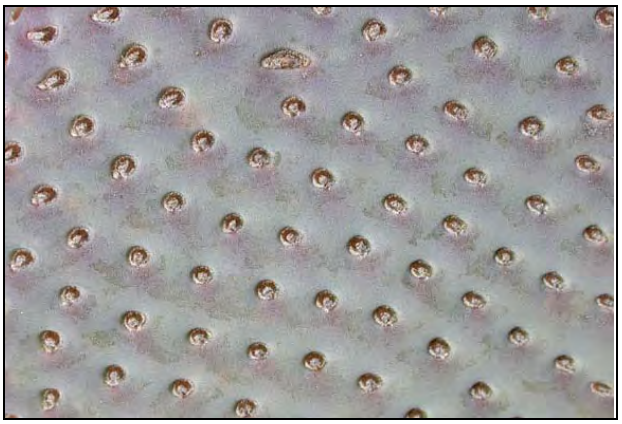
Appendix F

Representative photographs

Bakersfield cactus

Bakersfield cactus

Beavertail cactus



Beavertail cactus

Pale-yellow layia

Pale-yellow layia habitat

Pale-yellow layia habitat

Adobe yampah