

**Focused Fall Rare Plant Survey  
Soda Mountain Solar Project  
BLM Case # CACA49584  
San Bernardino County, California**

**October-November 2012**

**Prepared for:  
Bureau of Land Management  
Barstow Field Office  
2601 Barstow, CA 92311**

**Prepared by:  
C.S. Ecological Surveys and Assessments  
11331 Star Pine Road  
Truckee, CA 96161**

**Under Contract to:  
Panorama Environmental Inc.  
One Embarcadero Center, #740  
San Francisco, CA 94111**

## Executive Summary

This report presents the results of focused botanical surveys for fall-flowering rare plants at the proposed Soda Mountain Solar Project (SMS). Transect-based complete pedestrian surveys of the approximately 4,075-acre SMS botanical survey area were conducted from October 24 through November 5, 2012. The surveys generally complied with the botanical survey guidelines of the California Department of Fish and Game (CDFG), the California Native Plant Society (CNPS), the U.S. Fish and Wildlife Service (USFWS), and the Bureau of Land Management (BLM), but differed from these protocols in that only late-season surveys were conducted. The survey work plan was approved by both BLM and CDFG prior to performing surveys.

Pre-field research was conducted to select rare plant species with potential to be found within the survey area. The list of potentially occurring rare plants was derived from several sources including the California Natural Diversity Database, the CNPS On-line Inventory, and the California Consortium of Herbaria. Fifteen late summer and fall-flowering rare plant species were determined to have potential to occur within the survey area based on habitat preferences and known distribution.

No federal or state-listed plant taxa were observed. Two rare plant species were documented within the survey area: Emory's crucifixion-thorn (*Castela emoryi*, CRPR 2.3) and Utah vine milkweed (*Funastrum utahense*, CRPR 4.2). The populations of these species occurring within the SMS survey area were previously documented in springtime surveys of the site conducted in 2009. The number of occurrences and the approximate number of individuals observed is described in this report, and maps depicting the location of each occurrence are provided.

In total, 102 taxa of vascular plants were identified in the SMS survey area during the surveys. Of these taxa, 94 are native, two are naturalized, and six are considered noxious or invasive weeds in California. Although Utah vine milkweed was observed and mapped, this species was not formally included as a target species for the fall surveys described in this report because it typically flowers in the spring. All but three of the fifteen fall-flowering rare plants considered for occurrence within the survey area were determined to be absent based on the survey results. One of these three species, Emory's crucifixion-thorn, was found during the surveys and the remaining two species are considered unlikely to occur, but could not be definitively ruled out due to the timing of the surveys.

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# 1 Introduction

C.S. Ecological Surveys and Assessments (CESA), as a subcontractor to Panorama Environmental, was tasked with conducting botanical surveys for the proposed Soda Mountain Solar Project (SMS). At the request of the Bureau of Land Management (BLM), the botanical surveys described in this report were focused on locating and mapping occurrences of fall-flowering rare plant species with potential to occur within the SMS botanical survey area. Previous botanical surveys of the site conducted in 2009 focused on spring and early summer-flowering rare plants (URS 2009).

## 1.1 Project description

Soda Mountain Solar, LLC proposes to develop a 350 megawatt photovoltaic solar electric power generating facility within an approximately 4,500 acre right-of-way on federal land managed by BLM within the West Mojave Planning Area. Project components would include three arrays of photovoltaic panels, an electrical substation, access roads, drainage features, collector lines, and an operations and maintenance facility.

## 1.2 Project location and survey area

The Project is located within the West of Soda Lake 7.5' U.S Geological Survey (USGS) quadrangle on either side of the Interstate 15 (I-15) corridor, approximately six miles southwest of Baker, California. The site is contained within the valley between the north and south Soda Mountains (Figure 1).

For this report, a 4,075 acre botanical survey area encompassing the potential footprint of the proposed Project components was examined for the presence of fall-flowering rare plants (Figure 2). The survey area is divided into two polygons, one to the northeast of I-15 containing the North Array and one to the southwest of I-15 containing the East Array and South Array.

## 1.3 Project setting

### 1.3.1 Environmental setting and climate

The SMS Project is located within the Mojave Desert bioregion in a small valley surrounded by the Soda Mountains. Topography within the Project area is flat to gently sloping with elevations ranging from approximately 1,270 feet to 1,650 feet above mean sea level.

The North Array is located on an alluvial fan composed of areas of desert pavement interspersed with areas of loose gravel, rock and cobble-sized material. The soils and substrates in the southern and central portions of the North Array are primarily volcanic in origin. The alluvium of the northern portion of this array is primarily composed of volcanic and granitic derived materials with a small amount of limestone present. The East Array and South Array are located on similar low gradient alluvial outflows from the surrounding Soda Mountains. Soils and substrates within the East Array and South Array are mainly of volcanic origin with areas of sand, silty sand, cobble, rock, and desert pavement. Deeper sandy soils are most prevalent along the southern edge of the South Array, and in the proposed Razor Road re-alignment area at the extreme southern edge of the survey area. Throughout the survey area, the alluvial fans are dissected by desert washes, often with multiple braided channels. The active portions of the alluvial fans exhibit evidence of rapid runoff and high rates of erosion.

The climate of the region containing the Project area is arid with a bimodal rainfall regime in which the majority of rainfall occurs during two seasons, typically in winter and late summer or early fall. Late



season (June through October) rainfall in the vicinity of the Project prior to the surveys described in this report was above average. Between June and October 2012, 3.32 inches of precipitation were recorded in Baker, California, approximately six miles northeast of the Project area (WRCC 2012). The historic (1971 to present) average annual precipitation in Baker is 3.99 inches, and the historic average June through October precipitation is 1.46 inches (WRCC 2012). In 2012, winter rains accounted for just 0.21 inches of the 3.53 inches of precipitation recorded for the year to date.

### 1.3.2 Vegetation communities

Four vegetation alliances and two cover types (disturbed and developed ground) were observed within the SMS survey area (Table 1, Figure 3). The vegetation communities were identified and mapped at the alliance level using the keys and descriptions provided in *A Manual of California Vegetation* (Sawyer et al 2009).

**Table 1.** Vegetation alliance and cover type acreages within the SMS survey area

Vegetation alliance / cover type	Acres
Creosote bush-white bursage scrub	3,960.84
Cheesebush scrub	47.34
Creosote bush scrub	34.95
Developed	20.33
Disturbed	5.49
White bursage scrub	5.44
Total	4,074.39

#### Creosote bush-white bursage scrub

This vegetation community is common throughout the lower elevations of the Mojave Desert and covers about 97% of the SMS survey area (Table 1, Figure 3). The dominant species are creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) typically at low or moderate total cover. Widely scattered associated shrub and cactus species include saltbush species (*Atriplex* spp.), leafy rattan (*Krameria erecta*) and cholla species (*Cylindropuntia* spp.). There was little understory cover present in this community during the surveys, and the most common living herbaceous species observed were sandmat species (*Chamaesyce* spp.), hairy dalea (*Dalea mollissima*), and manybristle cinchweed (*Pectis papposa* var. *papposa*). Devil's spineflower (*Chorizanthe rigida*) was the predominate herbaceous species in areas of desert pavement.

The alluvial fans which support this vegetation type contain numerous intermittent braided channels, washes and gullies which occasionally support species typical of desert washes such as: sweetbush (*Bebbia juncea* var. *aspera*), woolly brickellbush (*Brickellia incana*), slender poreleaf (*Porophyllum gracile*), desert senna (*Senna armata*) and brittlebush species (*Encelia* spp.). However, within the areas mapped as Creosote bush-white bursage scrub, these wash species were typically not present in stands with enough cover or of sufficient size to warrant their mapping as separate vegetation alliances.

#### Cheesebush scrub

This vegetation community is typically found in washes, intermittent channels, and arroyos in the Mojave Desert. Within the SMS survey area a large wash that runs southwest to northeast through the South Array and East Array was mapped as this alliance (Figure 3). Cheesebush scrub is dominated by cheesebush, and associated species include sweetbush, woolly brickellbush, Thurber's sandpaper plant (*Petalonyx thurberi* ssp. *thurberi*), white bursage and creosote bush.

### Creosote bush scrub

This vegetation community is similar to Creosote bush-white bursage scrub, but white bursage is absent or present at <1% cover (Sawyer *et al* 2009). One moderately sized area within the East Array was mapped as this alliance (Figure 3). Shrub diversity in this area was very low, consisting primarily of widely spaced creosote bush and occasional white bursage at very low cover.

### White bursage scrub

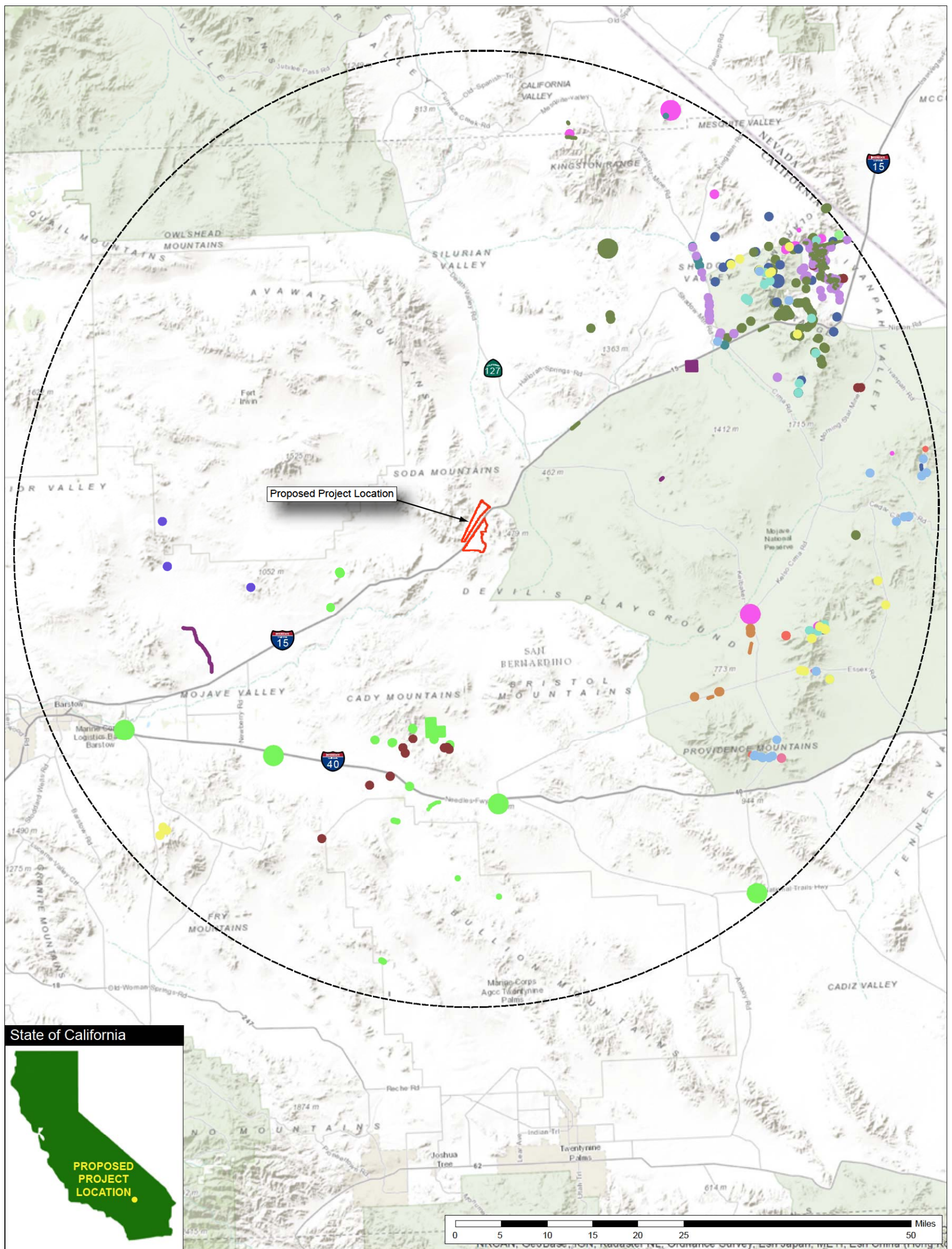
A small area with deep sandy soils located along the proposed Razor Road re-alignment at the southern boundary of the SMS survey area was mapped as the White bursage alliance (Figure 3). In this area, creosote bush cover is very low, and the vegetation is co-dominated by white bursage and big galleta (*Hilaria rigida*). Herbaceous species present in this area include desert sand verbena (*Abronia villosa* var. *villosa*), hairy prairie clover (*Dalea mollis*), and desert lily (*Hesperocallis undulata*).

### Other cover types

The existing dirt and gravel roads within the SMS survey area were mapped as developed land, and the abandoned mine near the proposed operations and maintenance facility in the southwestern corner of the South Array was mapped as disturbed ground.

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Figure 1: Project Vicinity Map



SOURCE: C.S. Ecological Surveys and Assessments 2012, ESRI 2012, and Panorama Environmental, Inc. 2012

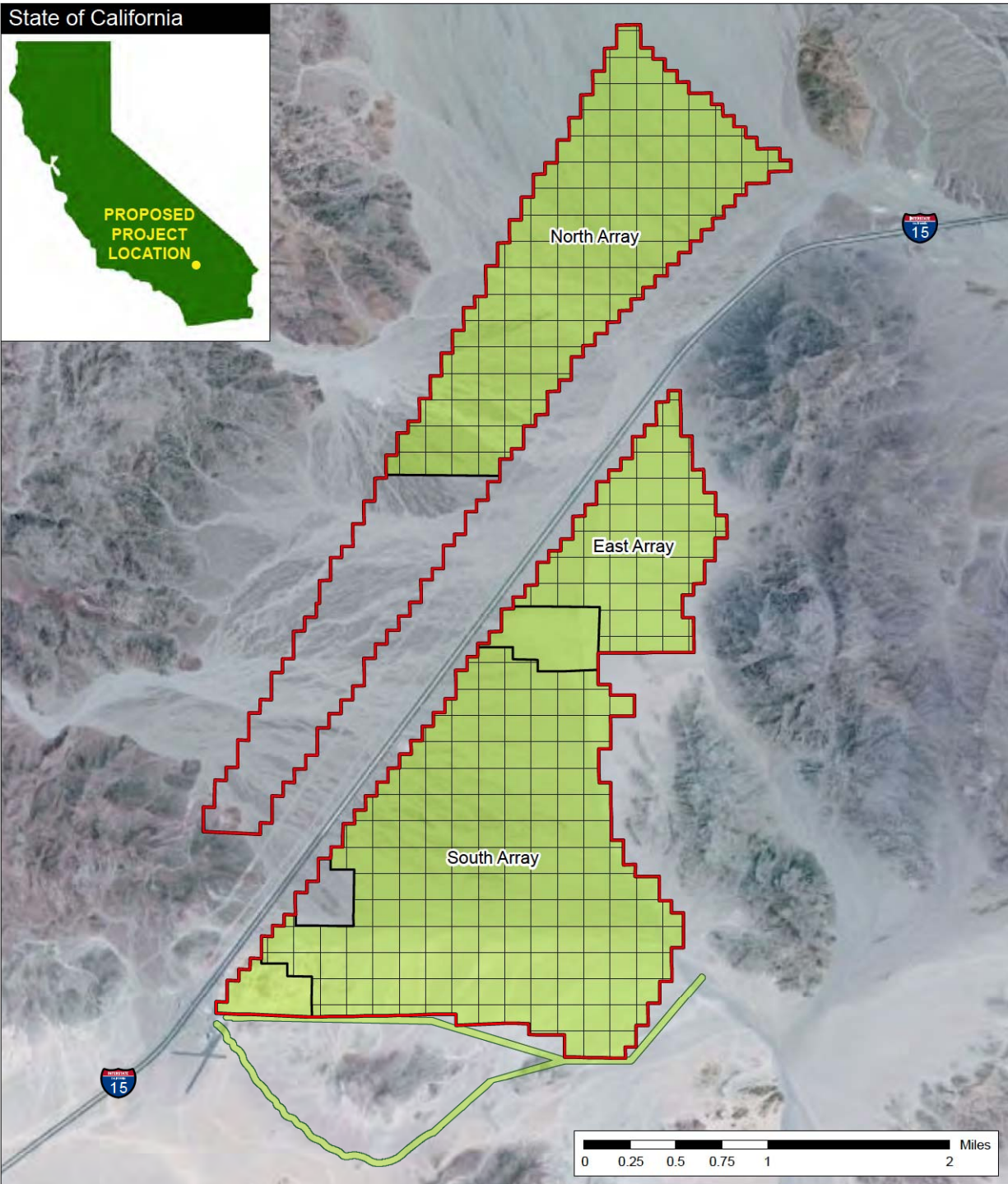
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- |                                                                                                                                                                                                                |                                                                                                                                                                                                        |                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="display:inline-block; width:15px; height:15px; background-color: #e91e63; border: 1px solid black; margin-right: 5px;"></span> Abrams' spurge ( <i>Chamaesyce abramsiana</i> )                    | <span style="display:inline-block; width:15px; height:15px; background-color: #f44336; border: 1px solid black; margin-right: 5px;"></span> Long-stem evening-primrose ( <i>Oenothera longissima</i> ) | <span style="display:inline-block; width:15px; height:15px; border: 2px solid red; margin-right: 5px;"></span> Proposed Project ROW      |
| <span style="display:inline-block; width:15px; height:15px; background-color: #4caf50; border: 1px solid black; margin-right: 5px;"></span> Cave evening-primrose ( <i>Oenothera cavernae</i> )                | <span style="display:inline-block; width:15px; height:15px; background-color: #9c27b0; border: 1px solid black; margin-right: 5px;"></span> Mojave milkweed ( <i>Asclepias nyctaginifolia</i> )        | <span style="display:inline-block; width:15px; height:15px; border: 1px dashed black; margin-right: 5px;"></span> 50 Mile Project Buffer |
| <span style="display:inline-block; width:15px; height:15px; background-color: #393b79; border: 1px solid black; margin-right: 5px;"></span> Death Valley sandmat ( <i>Chamaesyce vallis-mortae</i> )           | <span style="display:inline-block; width:15px; height:15px; background-color: #393b79; border: 1px solid black; margin-right: 5px;"></span> Nine-awned pappus grass ( <i>Enneapogon desvauxii</i> )    |                                                                                                                                          |
| <span style="display:inline-block; width:15px; height:15px; background-color: #66bb6a; border: 1px solid black; margin-right: 5px;"></span> Desert pincushion ( <i>Coryphantha chlorantha</i> )                | <span style="display:inline-block; width:15px; height:15px; background-color: #e67e22; border: 1px solid black; margin-right: 5px;"></span> Parry's spurge ( <i>Chamaesyce parryi</i> )                |                                                                                                                                          |
| <span style="display:inline-block; width:15px; height:15px; background-color: #42a5f5; border: 1px solid black; margin-right: 5px;"></span> Desert portulaca ( <i>Portulaca halimoides</i> )                   | <span style="display:inline-block; width:15px; height:15px; background-color: #fff176; border: 1px solid black; margin-right: 5px;"></span> Revolute spurge ( <i>Chamaesyce revoluta</i> )             |                                                                                                                                          |
| <span style="display:inline-block; width:15px; height:15px; background-color: #00897b; border: 1px solid black; margin-right: 5px;"></span> Desert wing-fruit ( <i>Acleisanthes nevadensis</i> )               | <span style="display:inline-block; width:15px; height:15px; background-color: #e91e63; border: 1px solid black; margin-right: 5px;"></span> Three-awned grama ( <i>Bouteloua trifida</i> )             |                                                                                                                                          |
| <span style="display:inline-block; width:15px; height:15px; background-color: #4caf50; border: 1px solid black; margin-right: 5px;"></span> Emory's crucifixion-thorn ( <i>Castela emoryi</i> )                | <span style="display:inline-block; width:15px; height:15px; background-color: #8d0000; border: 1px solid black; margin-right: 5px;"></span> Utah vine milkweed ( <i>Funastrum utahense</i> )           |                                                                                                                                          |
| <span style="display:inline-block; width:15px; height:15px; background-color: #673ab7; border: 1px solid black; margin-right: 5px;"></span> Jackass-clover ( <i>Wislizenia refracta</i> ssp. <i>refracta</i> ) | <span style="display:inline-block; width:15px; height:15px; background-color: #4db6ac; border: 1px solid black; margin-right: 5px;"></span> Wright's beebrush ( <i>Aloysia wrightii</i> )              |                                                                                                                                          |



Figure 2: Survey Area Map






SOURCE: C.S. Ecological Surveys and Assessments 2012, ESRI 2012, and Panorama Environmental, Inc. 2012

Scale: 1:55,000

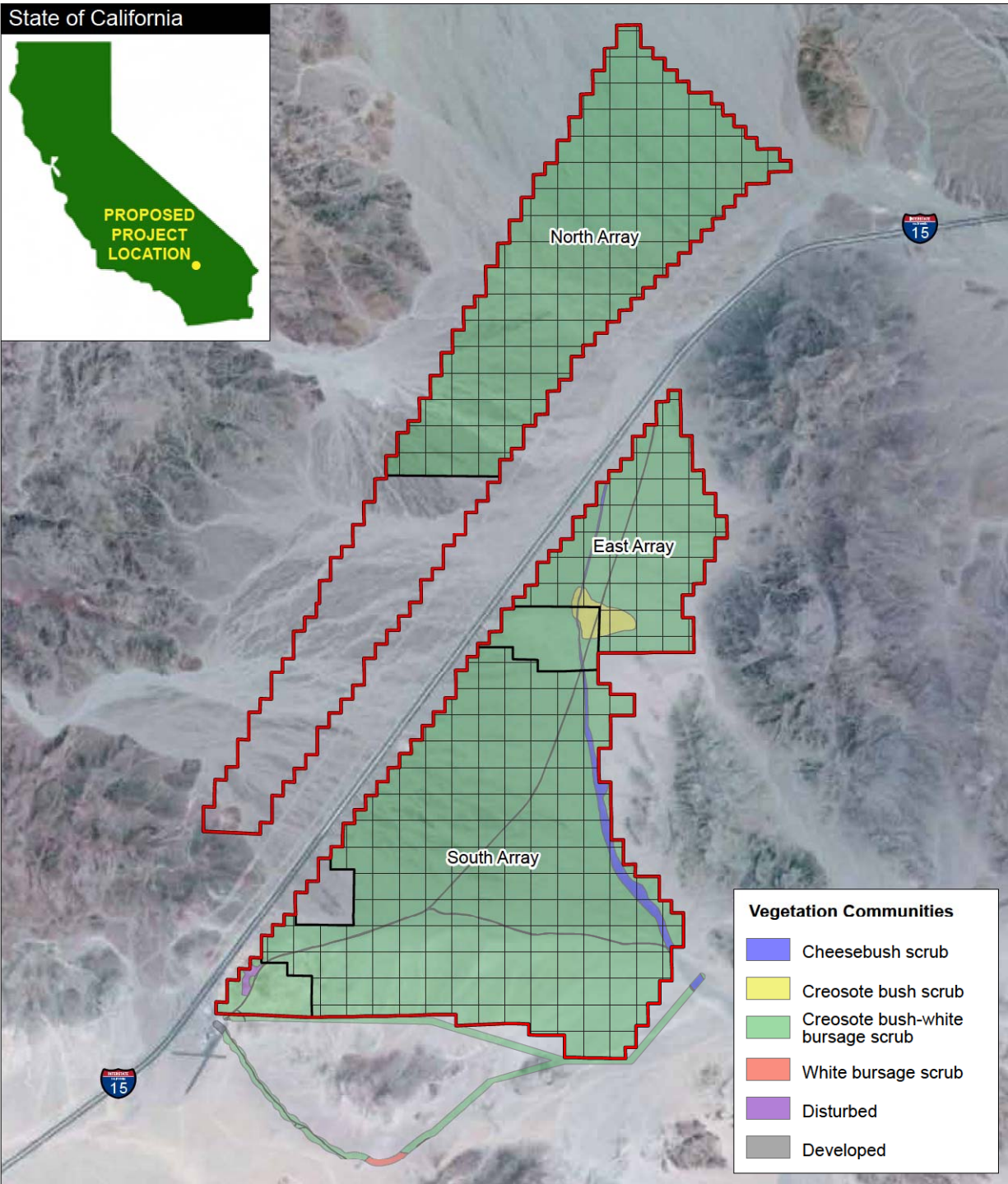
**LEGEND**



-  Proposed Project ROW
-  Solar Arrays
-  SMS Botanical Survey Area

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Figure 3: Vegetation Communities




SOURCE: C.S. Ecological Surveys and Assessments 2012, ESRI 2012, and Panorama Environmental, Inc. 2012

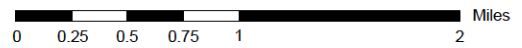
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 Proposed Project ROW

 Solar Arrays



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## 2 Methods

### 2.1 Pre-field research

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

A plant was considered to be rare if it was ranked by the California Native Plant Society (CNPS) in its online *Inventory of Rare and Endangered Plants of California* (CNPS 2012). The BLM (2013) uses the term "Special Status Plants" to include:

- [Federal Endangered, Threatened, Proposed and Candidate](#) plant species
- [BLM Sensitive](#) plants
- [California State Endangered, Threatened, and Rare species](#), which includes species with a California Rare Plant Rank of 1B by the CNPS

Only those plants defined by the Bureau of Land Management (BLM) as having special status will be listed as "special-status" species, other species will be referred to as "rare" plant species.

A species was determined to have potential to occur within the Project site if its known or expected geographic range includes the Project site or the vicinity of the Project site, if its known or expected habitat is found within or near the Project site, and if it was known or expected to be in detectable condition at the time of the survey. For this Project, the vicinity of the Project site was considered to be the portion of the central Mojave Desert within a 50 mile radius of the Project boundaries. A broad area of consideration was chosen due to the general paucity of records in the available databases (CNDDDB 2012b, CCH 2012, CNPS 2012) for this part of the Mojave Desert.

A preliminary list of potentially occurring rare plants was derived from several sources. Searches of the CNPS Inventory (2012) and the CNDDDB RareFind3 GIS database (2012b) were used to identify the late-flowering (September through November) rare plants known to occur within 50 miles of the Project site. The California Rare Plant Rank (CRPR) List 4 species with the potential to occur in the vicinity of the Project were identified by searching the CNPS Inventory for San Bernardino County species flowering from August to November in the following habitats: Sonoran desert scrub, Mojave desert scrub, Chenopod scrub, and Great basin scrub.

Species whose known distribution, habitat, or elevation range precluded their possible occurrence in the vicinity of the Project were generally not further considered, although some taxa with relatively low probability for occurrence were retained due to the incomplete state of knowledge of the habitat affiliations for many rare desert taxa. Table 2 summarizes information on 15 rare plants considered for occurrence 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 site.



**Table 2.** Fall blooming rare plants considered for occurrence.

Taxon	Status <sup>1</sup> Fed/State/BLM/CRPR	Flowering period	Habitat and elevation	Potential for occurrence in the Survey area
<i>Acleisanthes nevadensis</i> desert wing fruit	--/--/2.1	Apr - Sep	Rocky, gravelly soil with various geological origins in Joshua tree woodland and Mojavean desert scrub at elevations between 2,610 and 4,100 feet.	<b>Unlikely.</b> Suitable habitat is present, but this species was not observed in surveys conducted after the flowering period. Conditions for its detection were marginal during the surveys. All known locations are at higher elevations. The nearest known occurrence is approximately 35 miles to the northeast in Shadow Valley (CNDDDB 2012b).
<i>Aloysia wrightii</i> Wright's beebrush	--/--/4.3	Apr - Oct	Rocky, often carbonate substrates, in Joshua tree woodland and pinyon and juniper woodland at elevations between 2,950 and 5,250 feet.	<b>Absent.</b> Suitable habitat is not present and the species was not observed in surveys conducted during the flowering period. The nearest known occurrence is approximately 40 miles to the northeast in the Clark Mountains (CCH 2012).
<i>Asclepias nyctaginifolia</i> Mojave milkweed	--/--/2.1	May - June	Mojavean desert scrub and pinyon and juniper woodland, often in washes at elevations between 2,870 and 5,580 feet.	<b>Absent.</b> Suitable habitat is present, but this species was not observed during surveys conducted during the flowering period (URS 2009). The nearest known occurrence is approximately 35 miles to the northeast in Shadow Valley near Valley Wells (CNDDDB 2012b).
<i>Bouteloua trifida</i> three-awned grama	--/--/2.3	May - Sep	Mojavean desert scrub on rocky carbonate substrates at elevations between 2,300 and 6,560 feet.	<b>Absent.</b> Suitable habitat is not present and the species was not observed during surveys conducted after the flowering period. The nearest known occurrence of this species is approximately 40 miles to the southeast on limestone substrates in the Providence Mountains (CNDDDB 2012b).
<i>Castela emoryi</i> Emory's crucifixion-thorn	--/--/2.3	Apr - Sep	Gravelly soil in Mojavean desert scrub, on playas and in Sonoran desert scrub at elevations between 300 and 2,200 feet.	<b>Present:</b> Five individuals of this species were observed. These plants were previously mapped (URS 2009).
<i>Chamaesyce abramsiana</i> Abrams' spurge	--/--/2.2	Sep - Nov	Mojavean desert scrub, Sonoran desert scrub on sandy or silty substrates at elevations between 0 and 3,000 feet.	<b>Absent.</b> Suitable habitat is present, but this species was not observed in surveys conducted during the flowering period. The nearest known occurrence is approximately 40 miles to the southeast in the Providence Mountains (CNDDDB 2012b).
<i>Chamaesyce parryi</i> Parry's spurge	--/--/2.3	May - Nov	Desert dunes and Mojavean desert scrub on sandy soils at elevations between 1,300 and 2,400 feet.	<b>Absent.</b> Suitable habitat is present, but this species was not observed during surveys conducted during the flowering period. The nearest known occurrence is approximately 30 miles to the southeast in the Kelso Dunes (CNDDDB 2012b).

Taxon	Status <sup>1</sup> Fed/State/BLM/CRPR	Flowering period	Habitat and elevation	Potential for occurrence in the Survey area
<i>Chamaesyce revoluta</i> revolute spurge	--/--/4.1	Aug – Sep (Oct)	Rocky soils in Mojavean desert scrub at elevations between 3,590 and 10,170 feet..	<b>Absent:</b> Suitable habitat is not present and the species was not observed in surveys conducted during the flowering period. The nearest known location of this species is approximately 40 miles to the southeast in the Providence Mountains at over 1000 meters on rocky carbonate soil (CCH 2012).
<i>Chamaesyce vallis-mortae</i> Death Valley sandmat	--/--/4.2	May - Oct	Mojavean desert scrub on sandy or gravelly substrates at elevations between 750 and 4,790 feet.	<b>Absent:</b> Suitable habitat is present but this species was not observed in surveys conducted during the flowering period. The nearest known occurrence of this species is approximately 25 miles to the southwest at Alvord Mountain (CCH 2012).
<i>Coryphantha chlorantha</i> desert pincushion	--/--/2.1	Apr - Sep	Joshua tree woodland, Mojavean desert scrub and pinyon and juniper woodland on gravelly, rocky carbonate substrates at elevations between 150 and 5,590 feet.	<b>Absent:</b> Suitable habitat for this species is not present and it was not observed in surveys conducted after the flowering period. This cactus can be detected year round. The closest recorded occurrence of this species is approximately 15 miles to the northeast on carbonate substrates in the Shadow Mountains (CNDDDB 2012b).
<i>Enneapogon desvauxii</i> nine-awned pappus grass	--/--/2.2	Aug - Sep	Rocky carbonate soils in pinyon and juniper woodland at elevations between 4,180 and 5,990 feet.	<b>Absent:</b> Suitable habitat is not present and the species was not observed in surveys conducted after the flowering period. The nearest known occurrence is approximately 40 miles to the northeast on rocky carbonate substrate in the Clark Mountains (CNDDDB 2012b)
<i>Oenothera cavemae</i> cave evening-primrose	--/--/2.1	Mar - Nov	Great Basin scrub, Joshua tree woodland and Mojavean desert scrub on gravelly calcareous substrates or limestone outcrops at elevations between 2,490 and 4,200 feet.	<b>Absent:</b> Suitable habitat is not present and the species was not observed in surveys conducted during the flowering period. The nearest known occurrence is approximately 50 miles to the northeast in the Clark Mountains (CNDDDB 2012).
<i>Oenothera longissima</i> long stem evening-primrose	--/--/2.2	Jul - Sep	Mojavean desert scrub and pinyon and juniper woodland at seasonally mesic sites at elevations between 3,280 and 5,580 feet.	<b>Absent:</b> No suitable mesic habitat is present on the Project site and this species was not observed in surveys conducted after the flowering period. The closest known occurrence of this species is approximately 35 miles to the southeast in the Providence Mountains (CNDDDB 2012b).
<i>Portulaca halimoides</i> desert portulaca	--/--/4.2	Sep	Sandy soils in Joshua tree woodland at elevations between 3,280 and 3,940 feet.	<b>Unlikely.</b> Suitable habitat is present, but this species was not observed in surveys conducted after the flowering period. Conditions for its detection were marginal during the surveys. The nearest known occurrence of this species is approximately 35 miles to the northeast in Shadow Valley near Valley Wells (CCH 2012).



Taxon	Status <sup>1</sup> Fed/State/BLM/CRPR	Flowering period	Habitat and elevation	Potential for occurrence in the Survey area
<i>Wislizenia refracta</i> ssp. <i>refracta</i> jackass-clover	--/--/--/2.2	Apr - Nov	Desert dunes, Mojavean desert scrub, playas and Sonoran desert scrub at elevations between 1,970 and 2,620 feet.	<b>Absent:</b> Suitable habitat is present but this species was not observed in surveys conducted during the flowering period. The closest known occurrence of this species is approximately 35 miles to the southwest near Coyote Lake (CNDDDB 2012b).

**Sources:**

CNPS 2012; CNDDDB 2012b; CCH 2012.

<sup>1</sup> **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 Sensitive: Any species that are not federally Endangered, Threatened, or Proposed, but are designated by the BLM State Director for special management consideration.

California Rare Plant Rank 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 Rare Plant Rank threat categories:

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

<sup>2</sup> **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.

## 2.2 Reference site visits

Reference site visits were conducted for nine species of rare plants with potential to occur in the vicinity of the Project site. Table 3 contains information on the source and location of these sites, the date the sites were visited, and observations of the targeted rare plants. The sites visited on October 21, 2012 were visited by Ed Kentner (lead botanist) and Onkar Singh, a botanist experienced with the rare plant locations of the area. All other reference site visits were conducted by Ed Kentner and Catherine Schnurrenberger (lead botanists).

**Table 3.** Rare plant reference sites visited

Taxon	Occurrence source <sup>1</sup>	Coordinates (UTM NAD 83 Zone 11N)	Elev. (m)	Observations	Date
<i>Acleisanthes nevadensis</i> desert wing fruit	CNDDDB EO# 9	620147 3923440	1130	No plants found.	10/22
<i>Acleisanthes nevadensis</i> desert wing fruit	CNDDDB EO# 10	616035 3937691	1100	No plants found.	10/22
<i>Acleisanthes nevadensis</i> desert wing fruit	CNDDDB EO# 11	615845 3938705	984	Eight plants found in vegetative and fruiting condition in sandy gravel at the edge of a paved road.	10/22
<i>Asclepias nyctaginifolia</i> Mojave milkweed	O. Singh	637251 3939449	977	One plant observed in fruiting condition in a dry desert wash with carbonate substrate.	10/21
<i>Asclepias nyctaginifolia</i> Mojave milkweed	CNDDDB EO# 31	621871 3925362	1185	No plants found.	10/22
<i>Asclepias nyctaginifolia</i> Mojave milkweed	CNDDDB EO# 43	619264 3925122	1118	One plant observed growing in gravelly substrate at the edge of a paved road.	10/22
<i>Bouteloua trifida</i> three-awned grama	O. Singh	636474 3937744	1029	Several plants observed in past-flowering, but detectable condition on limestone outcrops.	10/21
<i>Chamaesyce abramsiana</i> Abrams' spurge	Incidental observation	620147 3923440	1129	Two plants observed in flowering and fruiting condition in white silty carbonate sediments	10/22
<i>Chamaesyce abramsiana</i> Abrams' spurge	CNDDDB EO# 8	667091 3881097	1085	About five plants observed in flowering and fruiting condition at the margins of a large desert wash.	10/22
<i>Chamaesyce abramsiana</i> Abrams' spurge	CNDDDB EO#7	634970 3864411	1246	Several plants observed in flowering and fruiting condition in gravelly and cobbly soils in desert scrub.	10/23
<i>Chamaesyce parryi</i> Parry's spurge	CNDDDB EO# 4	617246 3861441	762	Many plants observed in sandy habitat at the base of the Kelso dunes. The plants were large and conspicuous and in flowering and fruiting condition.	10/23
<i>Chamaesyce revoluta</i> revolute spurge	O. Singh	636480 3937829	1069	Several plants observed in dry, but identifiable and detectable conditions on rocky carbonate slopes.	10/21
<i>Chamaesyce revoluta</i> Revolute spurge	Collection UCR210572	659619 3906417	1480	About 15 plants observed in flowering and fruiting condition adjacent to roadside.	10/22
<i>Chamaesyce revoluta</i> revolute spurge	Collection UC1584095	633911 3864586	1256	Hundreds of plants observed on carbonate slopes in flowering and fruiting condition.	10/22
<i>Coryphantha chlorantha</i> desert pincushion	CNDDDB EO# 38	622299 3925689	1197	Two plants observed on cobble in desert scrub habitat with several other cactus species.	10/22
<i>Enneapogon desvauxii</i> nine-awned pappus grass	CNDDDB EO# 9	636550 3937814	1018	Several hundred plants observed in easily detectable condition on carbonate soils. Most plants past flowering, but some with flowers.	10/21
<i>Portulaca halimoides</i> desert portulaca	O. Singh	636286 3937723	1022	About a dozen plants observed in dry and disarticulating condition on carbonate soils. Detection and identification difficult.	10/21

<sup>1</sup> Sources: CNDDDB 2012b, CCH 2012, O. Singh 2012 pers. comm.

### 2.3 Botanical surveys

Botanical surveys for fall flowering taxa generally followed the guidelines published by CDFG (2009), USFWS (1996b), CNPS (2001), and BLM (2009). The surveys differed from the published protocols in being limited to late-season focused surveys for rare plant taxa that typically flower during the fall.

The eastern Mojave Desert region receives the majority of its rainfall during two seasons, typically in winter and late summer or early fall. Different sets of annual species germinate following rainfall in these two seasons, and many rare annual taxa are only detectable in one of these seasons. The surveys described in this report were therefore focused on the set of rare plants that typically flower following late summer and fall rainfall. Surveys for spring-flowering rare plants were conducted in 2009 (URS 2009).

Transect-based complete pedestrian surveys, at a spacing of 10 meters (approximately 33 feet), were conducted on the approximately 4,075 acre SMS botanical survey area (Figure 2) from October 24 to November 5, 2012 by lead botanists Ed Kentner (EK) and Catherine Schnurrenberger (CAS), assisted by botanists Jason Brooks (JB), Jeannette Halderman (JH), Nick Jenson (NJ), Russell Kokx (RK), and Chloe Scott (CBS). The total number of personnel hours for the survey was 810 hours. The qualifications for each of the surveyors are provided in Appendix E. A list of the personnel present on each of the survey dates is provided in Table 4.

**Table 4.** Survey dates and personnel

Date	Personnel
24-Oct	EK, CAS, JB, JH, NJ, RK, CBS
25-Oct	EK, CAS, JB, JH, NJ, RK, CBS
26-Oct	EK, CAS, JB, JH, NJ, RK, CBS
27-Oct	EK, CAS, JB, JH, NJ, RK, CBS
28-Oct	EK, CAS, JB, JH, NJ, RK, CBS
29-Oct	EK, CAS, JB, NJ, RK, CBS
30-Oct	EK, CAS, JB, NJ, RK, CBS
31-Oct	EK, CAS, JB, NJ, RK, CBS
1-Nov	EK, CAS, JB, NJ, RK, CBS
2-Nov	EK, CAS, NJ, RK
3-Nov	EK, CAS, NJ, RK
4-Nov	EK, NJ, RK
5-Nov	EK, NJ, RK

The goal of the surveys was to census, map, photograph and record habitat data for every rare plant location that was detected. The surveys were floristic in scope, meaning that all plants found in identifiable condition were identified to the level necessary to determine their rarity or listing status. Wildlife and sign that were observed during the survey were also documented (Appendix F).

Trimble® Geo XH global positioning systems (GPS) units with sub-meter accuracy were used to map all rare plant species encountered. Close-up and habitat photographs of rare species were taken at representative localities. The GPS units were equipped with data dictionaries for data collection, background files depicting the survey boundaries, and transect lines for navigation. The transect lines were spaced at 10 meter (approximately 33 ft.) intervals and were used to ensure complete coverage of the entire Project area. A data dictionary containing the data fields found on the standard CNDDDB Field Survey Form (CDFG 2012b) was used for the collection of the rare plant data.

A list of all plant species observed was compiled during the surveys (Appendix A). Many of the spring blooming annual plants were present only in dried condition and identification of some of these species was tentative or based solely on the experience of the crew. However, such tentative identifications were limited to dried spring-flowering taxa, and none of the targeted fall-flowering rare taxa were ruled out for occurrence based on dried specimens. Species observed only in dry condition are noted in Appendix A. The nomenclature used for plant scientific names throughout this report follows *The Jepson Manual 2nd Edition* (Baldwin 2012).

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 rare plants and a preliminary list of expected common plants prior to the field surveys. Lead personnel visited the reference populations listed above in Table 3 and shared notes, photographs, and habitat observations for the targeted rare taxa with the crew prior to conducting the surveys.

### 3 Results

A total of 102 taxa of vascular plants were identified in the SMS survey area during the surveys (Appendix A). Of these taxa, 94 are native, 2 are naturalized, and 6 are considered noxious or invasive weeds in California (Cal-IPC 2012; CDFA 2012). No federal or state-listed plant taxa were observed. Two rare plant species were documented within the survey area: Emory's crucifixion-thorn (*Castela emoryi*; CRPR 2.3) and Utah vine milkweed (*Funastrum utahense*; CRPR 4.2). Two species of rare plants could not be definitively ruled out for occurrence within the survey area: desert wing fruit (*Acleisanthes nevadensis*), and desert portulaca (*Portulaca halimoides*). Although the presence of both of these species within the SMS survey area is judged to be unlikely, the condition of these species was not favorable for detection at reference populations visited prior to the surveys.

#### 3.1 Rare plant species observed

##### 3.1.1 *Emory's crucifixion-thorn*

Emory's crucifixion-thorn is a perennial shrub or small tree in the quassia family (*Simaroubaceae*) that is known to occur in dry gravelly washes within Mojavean desert scrub, Sonoran desert scrub and playas at elevations between 295 and 2,198 feet (CNPS 2012). Crucifixion thorn has no state or federal listing status but is rated as California Rare Plant Rank (CRPR) list 2.3 which indicates that it is rare, threatened, or endangered in California, but more common elsewhere and is not very endangered in California. No major threats are listed for the survival of this species (CNPS 2012).

Emory's crucifixion-thorn occurs in the states of California and Arizona and the Mexican state of Sonora. Within California, it is known to occur in Imperial, Inyo, Riverside and San Bernardino counties. The nearest known populations are approximately 20 miles southwest of the SMS Project area north and south of I-15 (CCH 2012).

Two clumps of multi-stemmed Emory's crucifixion-thorn shrubs were recorded at one location during the surveys. The plants were growing at the margin of a desert wash in the middle of a large alluvial fan dominated by Creosote bush-white bursage scrub (Figure 4, Appendix B). One clump had an estimated three stems and two stems were observed in the second clump for a total of approximately five stems. The exact number of stems was difficult to determine due to the compact and spiny habit of the plants. Emory's crucifixion-thorn is a dioecious species with staminate (male) and pistillate (female) flowers

occurring on separate individuals. All of the stems observed within the SMS survey area were staminate (male). This population was previously documented in botanical surveys for the Project conducted during the spring of 2009 (URS 2009). Photographs of Emory's crucifixion-thorn are provided in Appendix C.

### 3.1.2 *Utah vine milkweed*

Utah vine milkweed is a perennial herbaceous vine in the dogbane family (*Apocynaceae*) that is known to occur on sand and gravel substrates in Mojavean desert scrub and Sonoran desert scrub communities at elevations between 328 and 4,708 feet (CNPS 2012). Utah vine milkweed has no state or federal listing status, but it is included on CRPR list 4.2, indicating that it is uncommon and fairly endangered in California (CNPS 2012). The current threats to Utah vine milkweed are solar energy development and off highway vehicles.

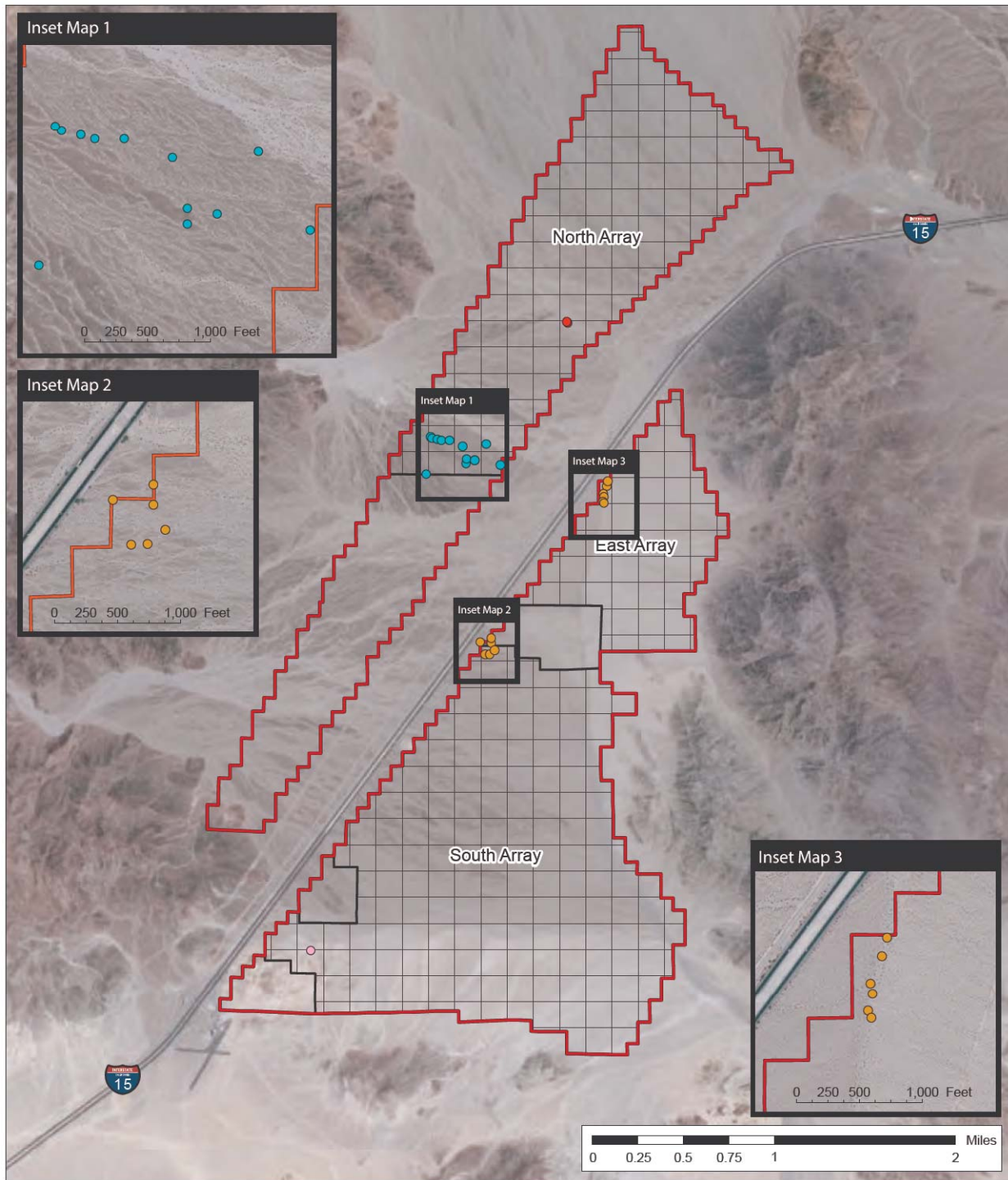
Within California, Utah vine milkweed has been reported to occur in Imperial, Riverside, San Bernardino and San Diego counties. Outside of California, Utah vine milkweed is known to occur in the states of Arizona, Nevada and Utah (CNPS 2012). More than sixty occurrences have been reported in San Bernardino County. The nearest reported occurrence of Utah vine milkweed is about 30 miles southwest of the Project site north of I-40 in the Desert Cady Mountains (CCH 2012).

Rare plant taxa such as Utah vine milkweed that typically flower in spring or early summer were not specifically targeted during the surveys described in this report, and were therefore not included for consideration in Table 2. However, a total of 68 Utah vine milkweed plants were recorded within the SMS surveys at 13 locations during the survey (Figure 4, Appendix B). All locations were within a quarter of a mile of each other and therefore represent a single occurrence for the purpose of reporting to CNDDDB. All locations were within deeply incised channels in a hydrologically active portion of the alluvial fan in the North Array. Utah vine milkweed was recorded in the same vicinity during surveys conducted in 2009 (URS 2009).

Many of the Utah vine milkweed plants observed appeared to be young shoots or seedlings, and the majority of the plants were in a vegetative state (~90%). Some plants were fruiting (~9%), and very few were flowering (<1%). Associated species include creosote bush, white bursage, sweetbush, leafy rattan, slender poreleaf, shortleaf baccharis (*Baccharis brachyphylla*), and sandmat species. Photographs of Utah vine milkweed are provided in Appendix C.

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
Figure 4: Rare Plant Locations







SOURCE: C.S. Ecological Surveys and Assessments 2012, RMT 2012, ESRI 2012, and Panorama Environmental, Inc. 2012

Scale: 1:55,000

**LEGEND**

-  Proposed Project ROW
-  Solar Arrays

-  western honey mesquite (*Prosopis glandulosa* var. *torreyana*)
-  Emory's crucifixion-thorn (*Castela emoryi*)
-  Utah vine milkweed (*Funastrum utahense*)
-  blue palo verde (*Parkinsonia florida*)

**PANORAMA**  
ENVIRONMENTAL, INC.

### **3.2 Rare plant taxa not observed, but with potential to occur**

No suitable habitat was present within the SMS survey area for seven of 14 fall-blooming rare plants that were considered for occurrence, but not observed during the surveys. These plants were determined to be absent (Table 2). Five rare plants with suitable habitat in the SMS survey area were also determined to be absent based on negative survey results. Two taxa were determined unlikely to occur within the SMS survey area, but could not be conclusively ruled out due to the conditions observed at nearby reference populations prior to the surveys.

Desert wing fruit (*Acleisanthes nevadensis*) was not found at two of the three reference sites searched (Table 3). Each of these sites was reported by the same observer in May and early June of 2011 (CNDDDB 2012), and the locations are considered reliable. While marginally suitable habitat for this species may be present within the SMS survey area (see Table 2), the 2012 botanical survey may have been conducted too late in the year to reliably detect this species. It was not detected at the SMS site in 2009 botanical surveys conducted in late May, during the blooming period for this species (URS 2009). The SMS survey area is lower in elevation than all of the known desert wing fruit sites, and the presence of this species is considered unlikely.

Desert portulaca (*Portulaca halimoides*) was found in dry and disarticulating condition at a reference site about 1,600 feet higher in elevation than the SMS survey area (Table 3). The remains of these small annual plants were difficult to locate and identify at the reference site, and would have been expected to be in similar or further degraded condition if present in the SMS survey area due to the lower elevation there. While marginally suitable habitat for this species may be present within the SMS survey area (see Table 2), the 2012 SMS fall botanical survey may have been conducted too late in the season to reliably detect this species. A collection of dried desert portulaca was shown to the surveyors prior to the surveys and efforts were made to search for it. Although many other species of dried annuals were found and identified during the surveys, desert portulaca was not found, and its presence in the SMS survey area is considered unlikely.

### **3.3 Blue palo verde and western honey mesquite**

The locations of all blue palo verde (*Parkinsonia florida*) and western honey mesquite (*Prosopis glandulosa* var. *torreyana*) trees were mapped during the surveys. Within the Project area, a single individual of western honey mesquite and twelve individual blue palo verde trees were mapped (Figure 4). While stands of vegetation dominated by these species are considered sensitive communities in California (Sawyer *et al* 2009), neither of these species was present in enough abundance or at high enough cover to warrant recognition as a distinct community type (Sawyer *et al* 2009).

### **3.4 Invasive non-native plant species**

Six species of invasive or noxious weeds were observed during the surveys (Table 5). All but one of these species are annual plants that typically complete their life cycle in winter and spring, and the majority of the plants observed were senescent and dry during the surveys. The remaining species, five-stamen tamarisk (*Tamarix chinensis*), is a perennial tree that can be observed year round. While the timing of the fall surveys described in this report was not optimal for accurately evaluating the distribution and abundance of the invasive non-native plant species within the survey area, a general assessment of the abundance of these species is provided in Table 5.

**Table 5.** Invasive non-native plant species observed.

Invasive species	Cal-IPC Rating <sup>1</sup>	CDFA Rating <sup>2</sup>	SMS Abundance <sup>3</sup>
<i>Brassica tournefortii</i> Saharan mustard	High (A,A,B)	Not rated	Most abundant in sandy soils in the South Array, but scattered in patches throughout the SMS survey area.
<i>Bromus tectorum</i> cheatgrass	High (A,B,A)	Not rated	Several plants observed in the South Array
<i>Erodium cicutarium</i> redstem stork's bill	Limited (C,C,A)	Not rated	Several plants observed in the South Array
<i>Mesembryanthemum crystallinum</i> common iceplant	Moderate (B,B,C)	Not rated	Several patches observed in the South Array
<i>Schismus barbatus</i> Mediterranean grass	Limited (B,C,A)	Not rated	Widespread throughout the SMS survey area
<i>Tamarix chinensis</i> five-stamen tamarisk	Not rated	B	One plant observed in the South Array

Table sources: Cal-IPC 2012, CDFA 2012

<sup>1</sup>Cal-IPC ratings:

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure.

Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure.

Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score.

<sup>1</sup>Cal-IPC Scores (Impact, Invasiveness, Distribution)

A = Severe

B = Moderate

C = Limited

D = None

<sup>2</sup>CDFA ratings:

A –Recommended for statewide eradication by the CDFA.

B – Widely distributed in some regions of the state but not others; recommended for regional eradication within California.

<sup>3</sup>SMS abundance:

Based on observations during October and November 2012. All of these species are annuals except for five-stamen tamarisk (a perennial tree), and their abundance is more appropriately assessed in spring.

## 4 Discussion and recommendations

Focused surveys for fall-flowering rare plants within the SMS botanical survey area were conducted from October 24 through November 5, 2012. Late season (June through October) rainfall in the vicinity of the Project area was above average in 2012, and fall-flowering annual plants were abundant in many areas of the eastern Mojave Desert in the vicinity of the Project at the time of the surveys. The diversity and abundance of fall-flowering annuals within the SMS survey were generally low. The site is predominantly composed of low elevation Creosote bush-white bursage scrub, and shrub diversity was also generally low, with the possible exception of a few of the larger desert washes. Overall, there is little potential habitat for fall-flowering rare plant species over the majority of the survey area.

No federal or state-listed plant taxa were observed during the surveys or are likely to be present within the SMS botanical survey area. Two species of rare plants were observed during the surveys, Emory's crucifixion-thorn and Utah vine milkweed. Both of these species have been previously documented and



reported for this site (URS 2009). A discussion of these populations and their significance with consideration for other nearby occurrences and the distribution of the species as a whole is presented below. Potential impacts are considered and mitigation and management measures are suggested.

#### **4.1 Emory's crucifixion-thorn**

One small population of Emory's crucifixion-thorn was observed within the SMS survey area. Two clumps of several stems each, separated by about 50 feet, were observed at the margins of a desert wash. All of the plants observed were staminate (male), and the population is therefore incapable of reproduction by seed. It has been suggested that Emory's crucifixion-thorn may sometimes reproduce by clonal propagation (Shreve 1964), and it is possible that the two clumps present in the survey area are fragments of the same genetic individual that became spatially separated by wash flows.

Several occurrences of Emory's crucifixion-thorn have been documented to the southwest of the Project site in the vicinity of the I-15 and I-40 corridors (CCH 2012). The species is more common in the Sonoran Desert and in Arizona (Sanders 1999). Only one population, located near Ridgecrest, California, has been recorded north of the SMS site (CCH 2012).

The majority of the known populations of Emory's crucifixion-thorn in the Mojave Desert are widely scattered and, like the SMS population, typically consist of only a few individual plants (Sanders 1999). Reproduction by seed has been reported to be low in many of the Mojave populations (Sanders 1999). The seeds appear to be adapted for dispersal by large herbivores, and it may be that this plant was formerly dispersed by the now extinct Pleistocene megafauna (Sanders 1999). The species is only very locally common anywhere in California, and most of the Mojave populations are small, have low reproduction rates and limited dispersal, and are therefore precarious (Sanders 1999).

#### **4.2 Utah vine milkweed**

A population of about 68 Utah vine milkweed plants was observed within the SMS survey area during the fall surveys. The plants were widely scattered at 13 locations separated by about a quarter of a mile. In previous surveys, plants were mapped in the same general location, but the number of individuals observed and the exact locations of the plants differ slightly (URS 2009). In 2009 plants were also mapped about 5,000 feet to the north of the population documented in this report, in an area where no plants were observed during the fall 2012 surveys (URS 2009). Utah vine milkweed is a perennial species and it is unlikely that all Utah vine milkweed plants at the northern locations would have died off between 2009 and 2012. The timing of the fall surveys was not optimal for the detection of this species, and the discrepancy between the two survey results may be best explained by the difference in timing, and by the very poor winter and spring precipitation during the 2011-2012 growing season.

There are many documented occurrences of Utah vine milkweed in the central Mojave Desert, but the population located on the SMS site is located on the northwestern edge of the known range for the species (CCH 2012). Nevertheless, potential habitat for this species has been identified as far north as Ridgecrest, California (Rosatti 2012). In California, the available records indicate that the species is more abundant in the central Mojave Desert between the I-40 and I-10 corridors (CCH 2012).

#### **4.3 Other rare plants**

Two rare plant taxa could not be conclusively ruled out for presence within the SMS survey area due to the conditions observed at nearby reference populations prior to the fall surveys: desert wing fruit and

desert portulaca. Both of these species were determined to be unlikely to occur within the SMS survey area based on habitat conditions and the results of previous surveys. While additional appropriately-timed surveys would be required to conclusively rule out the presence of these species, such surveys are not recommended due to the low probability for their occurrence at the SMS site.

#### **4.4 Potential impacts**

Ground disturbing activities such as clearing vegetation, scraping or blading of the soil surface, deposition of foreign materials such as fill dirt, and excavation in the areas occupied by Utah vine milkweed or Emory's crucifixion-thorn would directly impact the plants by removing or destroying them, resulting in the loss of the populations. The shading of plants due to the construction of solar panels could also directly impact the plants by reducing the available light for photosynthesis, growth and reproduction.

Indirect impacts due to the construction of the proposed Project may include alteration of the natural hydrologic regime and the introduction of invasive and noxious weeds. Both Emory's crucifixion-thorn and Utah vine milkweed occupy desert wash habitats within the SMS survey area, and any alteration of hydrology of these washes, either by decreasing or increasing the natural flows, may adversely affect the populations, leading to their loss. The introduction of invasive exotic plant species may increase competition for scarce water resources and reduce the amount of water available for these populations. The spread of invasive weeds could therefore adversely affect the viability of these populations.

Populations of Emory's crucifixion-thorn and Utah vine milkweed occur primarily in remote desert locations that, until recently, have only rarely been impacted by human activities. However, in the past several years, numerous renewable energy projects have been proposed throughout the Mojave Desert (BLM 2012), and the construction of these projects could result in cumulative impacts to these species that exceed the impacts due to the individual projects. Habitat destruction due to off-highway vehicle (OHV) use may also contribute to cumulative impacts on these species.

##### *4.4.1 Impacts to Emory's crucifixion-thorn*

The one population of two Emory's crucifixion-thorn plants is located within a rocky drainage in the proposed SMS Project ROW. If this population is not avoided by modifications to the Project design, direct impacts due to clearing, crushing, or shading of the plants could occur. Potential indirect impacts to this population include: alteration of local hydrology, inadvertent fill due to nearby grading or ground disturbance, and an increase in invasive plant species. No other impacts such as OHV use appear likely to affect this isolated population of Emory's crucifixion-thorn.

The potential cumulative impacts to all known locations of Emory's crucifixion-thorn that may occur due to the construction of renewable energy projects in the California deserts may be quantified as follows: In total, 11 of 53 (21%) known California occurrences (CNDDDB 2012, CCH 2012) are found within the proposed right-of-way (ROW) for a renewable energy project (BLM 2012). Twenty seven (51%) of the known sites occur within three miles of a proposed ROW, a radius in which the plants may be affected by indirect impacts. The actual cumulative impacts to populations of this species due to these proposed projects will depend on the approval and actual construction of the projects, and on the avoidance and mitigation measures implemented for the species on each project. Cumulative impacts on this species due to OHV use are difficult to evaluate due to the lack of available information. However, due to the robust and spiny nature of this plant, direct impacts due to OHV use are probably uncommon as the plants would likely be avoided by motorists. Indirect impacts due to OHV use such as erosion, alteration

of hydrologic regimes, and the spread of weeds, may also contribute to cumulative impacts on this species. Additional protection of this species, beyond avoidance, is only provided within the Pisgah ACEC (Conservation Area) located north of Interstate 40, approximately 50 miles south of the SMS project.

Direct or indirect impacts to the Emory's crucifixion-thorn population within the SMS survey area that could lead to the loss of the population would not likely contribute to a trend toward federal listing or loss of species viability. This determination is based on the existence of more than 50 occurrences recorded for the species in the deserts of California (CNDDDB 2012, CCH 2012) and additional populations in Arizona and Sonora, Mexico (Sanders 1999). The SMS population is composed entirely of male plants, and is apparently incapable of contributing to the reproduction and spread of the species. However, impacts resulting in the loss of the population would reduce the known range of the species in California.

#### *4.4.2 Impacts to Utah vine milkweed*

The 13 locations of Utah vine milkweed observed within the SMS project area in 2012 are all located within active drainages on rocky alluvial fans. Additional Utah vine milkweed locations within active drainages approximately 5,000 feet to the north of the sites documented in this report were documented in previous botanical surveys (URS 2009). If the areas where Utah vine milkweed occurs within the proposed ROW are not avoided by modifications to the Project design, direct impacts due to clearing, crushing, or shading of the plants could occur. Potential Indirect impacts to Utah vine milkweed include alterations of the hydrologic regime of the occupied washes, inadvertent fill due to nearby grading or ground disturbance, and an increase in invasive plant species. OHV use was not observed near the locations of Utah vine milkweed, and such impacts are not expected due to the rocky nature of the occupied washes.

The potential cumulative impacts to all known populations of Utah vine milkweed that may occur due to the construction of renewable energy projects in the California deserts may be quantified as follows: In total, eight of 96 (8%) mapped records of the species in California (CCH 2012) occur within the proposed ROW for renewable energy projects (BLM 2012). Twenty-nine of these records (30%) occur within three miles of a proposed ROW, a radius in which the plants may be affected by indirect impacts. The actual cumulative impacts to populations of this species due to these proposed projects will depend on the approval and actual construction of the projects, and on the avoidance and mitigation measures implemented for the species on each project. Cumulative direct and indirect impacts to Utah vine milkweed due to habitat destruction caused by OHV use may also occur, but the number of sites where such impacts have taken place or are likely to occur is difficult to evaluate due to the lack of available information.

Direct or indirect impacts to the Utah vine milkweed population within the SMS survey area that lead to the loss of the population would not likely contribute to a trend toward federal listing or loss of species viability. This determination is based on the existence of more than 90 occurrences recorded for the species in the deserts of California (CCH 2012). However, impacts resulting in the loss of the population would reduce the known range of the species in California.

### **4.5 Recommended management and mitigation measures**

#### *4.5.1 Avoidance and minimization of impacts*

Federal and state agencies emphasize the need to avoid and minimize impacts to rare plant populations. The following actions are recommended:

- Reduce the Project footprint to the minimum area needed to meet Project objectives.
- Eliminate from the Project footprint areas containing Utah vine milkweed and Emory's crucifixion thorn
- Minimize the area disturbed during construction.
- Restrict vehicle traffic to established corridors, and do not permit off-road driving.
- Clearly mark or fence areas containing rare plant species, and avoid impacts to these areas during construction and operations.
- Control invasive weeds during construction and operations phases of the Project.
- Avoid changes to the topography or alterations of the hydrology of desert washes currently supporting Utah vine milkweed and Emory's crucifixion thorn,

#### 4.5.2 Mitigation measures

If avoidance and minimization measures cannot be implemented to successfully avoid all direct and indirect impacts to rare plant populations within the Project ROW, the following measures should be considered to mitigate the actual Project impacts, as appropriate.

Mitigation measures for impacts to rare plants that have been proposed or implemented for alternative energy projects in California have included: establishment of on-site and off-site plant protection areas, protocol-level rare plant surveys of public lands, and translocation. Monitoring (Elzinga *et al* 1998) and adaptive management (Atkinson *et al* 2004) are often required components of mitigation programs.

##### On-site Rare Plant Protection Areas

On-site rare plant protection areas are areas within the Project boundaries that have been set aside to protect important populations of rare plants and their habitats. These areas are designated as *no impact zones* and are fenced and signed. No construction activities or other disturbances are permitted within these areas. Indirect impacts resulting from actions outside of the protection area are avoided or minimized. The size of on-site protection areas is determined on a project-by-project basis.

##### Off-site Rare Plant Protection Areas

Off-site rare plant protection areas are sites located outside of the Project boundaries. The sites are chosen for their protectability and the presence of suitable habitat for rare plants that may already support populations of the plant species for which mitigation is required. Habitat improvements are implemented to increase the likelihood of rare plant survival and reproduction. Typically, these sites are on private land, and must be purchased. Public land is usually not available for this type of mitigation. The size of off-site protection areas is determined on a project-by-project basis.

##### Translocation

Translocation refers to attempts to establish new rare plant individuals in occupied or unoccupied habitat, using seeds, or salvaged or propagated rare plant individuals (Falk *et al* 1996). Translocations used as mitigation in California have a low documented rate of success (*ibid.*). Therefore, it is recommended as a remedial measure and, if used, translocations should be regarded as experimental efforts with low likelihood of success. Detailed evaluation of past efforts is recommended to select seed collection, propagation and out-planting procedures that are suited to the species and habitats involved in the translocation effort.

#### 4.5.3 *Invasive weed management*

Invasive weeds have many deleterious effects on the environment, including: loss of native species and habitat diversity, reduction in food resources for wildlife, increased risk of wildfire, poisoning of wildlife and livestock, and utilization of scarce water resources (Bossard *et al* 2000). To reduce these effects, a comprehensive weed management strategy is recommended, including general measures to prevent the spread and introduction of noxious weeds and an Integrated Weed Management Plan with detailed procedures for controlling weed infestations, monitoring the results, and conducting remedial actions when necessary. Alternative energy projects currently under review have been required to mitigate weed impacts through comprehensive weed control measures (CH2M HILL 2008).

##### General recommendations to prevent the spread and introduction of invasive weeds

The spread of invasive weed species already present within the Project area, and the introduction of new invasive weed species to the Project area can be reduced by implementing the following measures:

- Educate all construction workers through a Worker Training Program about the need to minimize site disturbance and limit the spread of weeds.
- Minimize the size and extent of areas disturbed during construction, including especially the removal or disturbance of native vegetation.
- Restrict vehicles to established roads and use the minimum number of vehicles.
- Store construction vehicles on-site and use for transporting workers and equipment within the site; park commuter vehicles at the site entrance.
- Operate vehicle wash and inspection stations at all site entrances to clean soil and seeds from all vehicles entering and leaving the site.
- Use certified weed-free materials for erosion control and other restoration activities.
- Revegetate areas of temporary disturbance with local native plant species as soon as construction is complete to reduce erosion and inhibit the establishment of invasive weeds.
- Do not knowingly introduce new plant species to the site, including for landscaping.
- Control infestations of invasive weeds during construction and operation phases.
- Monitor invasive weed presence and control new infestations rapidly to prevent further spread.

##### Integrated weed management plan

In addition to the general measures listed above, it is recommended that a comprehensive Integrated Weed Management Plan be developed and implemented. The goals of the plan would be to establish procedures for long-term invasive weed control, monitoring and remedial measures. Recommended components of the Integrated Weed Management Plan are:

##### *Prevention Measures:*

- Measures to prevent the introduction of new weeds and the spread of existing weeds, such as those described above.

#### *Invasive Weed Assessment:*

- Conduct a comprehensive assessment of invasive weeds within the Project area.
- Complete a baseline survey and map invasive weed locations prior to construction.
- Consult with the BLM weed specialist and the County Agricultural Commissioner to identify weeds of high significance to these agencies.
- Compile a list of noxious and invasive weeds with potential to invade the project site
- Use agency input and information from the baseline survey to identify and prioritize weed species of concern.

#### *Weed Control Methods:*

- Develop species-specific control procedures for high priority invasive weeds.
- Potential methods include: physical or mechanical removal, chemical control, environmental control, and others (Bossard *et al* 2000).
- Establish a long-term schedule for regular weed control throughout the Project site.
- Implement a regular weed control program using approved procedures, properly maintained equipment, and safety gear.

#### *Monitoring and Follow-up:*

- Conduct annual monitoring to assess weed presence and the success of control measures.
- Implement remedial (follow-up) control measures if previous procedures have not achieved eradication or control objectives.

#### *Reporting:*

- Prepare an annual report that documents the outcome of the weed control measures and recommends changes to improve rates of success.
- Distribute the annual report to agencies concerned with invasive weeds, including the BLM and San Bernardino County.

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## Appendix A

### Vascular Plant Species Observed

	Scientific name	Common name	Nativity <sup>1</sup>	Condition <sup>2</sup>
<b>Gymnosperms</b>				
<b>Ephedraceae (Mormon-tea family)</b>				
	<i>Ephedra californica</i>	California jointfir	Native	veg
<b>Eudicots</b>				
<b>Aizoaceae (fig-marigold family)</b>				
	<i>Mesembryanthemum crystallinum</i>	common iceplant	Invasive	dry
<b>Amaranthaceae (amaranth family)</b>				
	<i>Amaranthus fimbriatus</i>	fringed amaranth	Native	fl
	<i>Tidestromia suffruticosa</i> var. <i>oblongifolia</i>	Arizona honeysweet	Native	veg
<b>Apocynaceae (dogbane family)</b>				
	<i>Asclepias erosa</i>	desert milkweed	Native	veg/fl/fr
	<i>Asclepias subulata</i>	rush milkweed	Native	veg/fl/fr
	<i>Funastrum cynanchoides</i> var. <i>hartwegii</i>	climbing milkweed	Native	veg
	<i>Funastrum hirtellum</i>	hairy milkweed	Native	veg/fl/fr
	<i>Funastrum utahense</i> *	Utah vine milkweed	Native	veg/fl/fr
<b>Asteraceae (aster family)</b>				
	<i>Ambrosia dumosa</i>	white bursage	Native	veg/fl
	<i>Ambrosia salsola</i>	cheesebush	Native	veg
	<i>Baccharis brachyphylla</i>	shortleaf baccharis	Native	veg
	<i>Baileya</i> sp.	desert marigold	Native	veg
	<i>Bebbia juncea</i> var. <i>aspera</i>	sweetbush	Native	veg/fl
	<i>Brickellia incana</i>	woolly brickellbush	Native	veg
	<i>Chaenactis</i> sp.	pincushion	Native	dry
	<i>Encelia farinosa</i>	brittlebush	Native	veg
	<i>Encelia frutescens</i>	button brittlebush	Native	veg/fl
	<i>Geraea canescens</i>	hairy desertsunflower	Native	veg
	<i>Gutierrezia microcephala</i>	threadleaf snakeweed	Native	fl
	<i>Palafoxia arida</i> var. <i>arida</i>	desert palafox	Native	veg/fl
	<i>Pectis papposa</i> var. <i>papposa</i>	manybristle cinchweed	Native	veg/fl
	<i>Peucephyllum schottii</i>	Schott's pygmycedar	Native	veg
	<i>Porophyllum gracile</i>	slender poreleaf	Native	veg
	<i>Psathyrotes ramosissima</i>	velvet turtleback	Native	veg
	<i>Rafinesquia neomexicana</i>	New Mexico plumeseed	Native	dry

Scientific name	Common name	Nativity <sup>1</sup>	Condition <sup>2</sup>
<i>Stephanomeria exigua</i>	small wirelettuce	Native	veg
<i>Stephanomeria pauciflora</i>	wire-lettuce	Native	veg/fl
<b>Boraginaceae (borage family)</b>			
<i>Amsinckia</i> sp.	fiddleneck	Native	dry
<i>Cryptantha angustifolia</i>	Panamint cryptantha	Native	dry
<i>Cryptantha micrantha</i>	redroot cryptantha	Native	dry
<i>Cryptantha nevadensis</i>	Nevada cryptantha	Native	dry
<i>Pectocarya platycarpa</i>	broadfruit combseed	Native	dry
<i>Phacelia crenulata</i>	cleftleaf wildheliotrope	Native	dry
<i>Phacelia tanacetifolia</i>	lacy phacelia	Native	dry
<i>Tiquilia plicata</i>	fanleaf crinklemat	Native	veg/fl
<b>Brassicaceae (mustard family)</b>			
<i>Brassica tournefortii</i>	Saharan mustard	Invasive	veg
<i>Caulanthus lasiophyllus</i>	California mustard	Native	dry
<i>Descurainia pinnata</i>	western tansymustard	Native	dry
<i>Streptanthella longirostris</i>	longbeak streptanthella	Native	dry
<b>Cactaceae (cactus family)</b>			
<i>Cylindropuntia acanthocarpa</i> var. <i>coloradensis</i>	buckhorn cholla	Native	veg
<i>Cylindropuntia echinocarpa</i>	silver cholla	Native	veg
<i>Cylindropuntia ramosissima</i>	pencil cholla	Native	veg
<i>Echinocactus polycephalus</i> var. <i>polycephalus</i>	cottontop cactus	Native	veg
<i>Mammillaria tetrancistra</i>	common fishhook cactus	Native	veg
<i>Opuntia basilaris</i> var. <i>basilaris</i>	beavertail pricklypear	Native	veg
<b>Campanulaceae (bellflower family)</b>			
<i>Nemacladus</i> sp.	threadplant	Native	dry
<b>Caryophyllaceae (pink family)</b>			
<i>Achyronychia cooperi</i>	onyxflower	Native	fl
<b>Chenopodiaceae (goosefoot family)</b>			
<i>Atriplex hymenelytra</i>	desertholly	Native	veg/fr
<i>Atriplex polycarpa</i>	cattle saltbush	Native	veg/fr
<b>Convolvulaceae (morning-glory family)</b>			
<i>Cuscuta</i> sp.	dodder	Native	dry
<b>Cucurbitaceae (cucumber family)</b>			
<i>Cucurbita palmata</i>	coyote gourd	Native	veg/fl/fr
<b>Euphorbiaceae (spurge family)</b>			
<i>Chamaesyce micromera</i>	Sonoran sandmat	Native	veg/fl/fr
<i>Chamaesyce polycarpa</i>	smallseed sandmat	Native	veg/fl/fr

Scientific name	Common name	Nativity <sup>1</sup>	Condition <sup>2</sup>
<i>Chamaesyce setiloba</i>	Yuma sandmat	Native	veg/fl/fr
<i>Croton californicus</i>	California croton	Native	veg
<i>Stillingia spinulosa</i>	annual toothleaf	Native	veg
<b>Fabaceae (pea family)</b>			
<i>Dalea mollis</i>	hairy prairie clover	Native	veg
<i>Dalea mollissima</i>	hairy dalea	Native	veg/fl
<i>Parkinsonia florida</i>	blue palo verde	Native	veg/fr
<i>Prosopis glandulosa</i> var. <i>torreyana</i>	western honey mesquite	Native	veg/fr
<i>Senna armata</i>	desert senna	Native	veg
<b>Geraniaceae (geranium family)</b>			
<i>Erodium cicutarium</i>	redstem stork's bill	Invasive	veg
<i>Erodium texanum</i>	Texas stork's bill	Native	veg
<b>Krameriaceae (krameria family)</b>			
<i>Krameria erecta</i>	leafy rattan	Native	veg/fl/fr
<b>Lamiaceae (mint family)</b>			
<i>Salvia columbariae</i>	chia	Native	dry
<b>Loasaceae (loasa family)</b>			
<i>Petalonyx thurberi</i> subsp. <i>thurberi</i>	sandpaper plant	Native	fl
<b>Malvaceae (mallow family)</b>			
<i>Eremalche rotundifolia</i>	desert fivespot	Native	dry
<b>Molluginaceae (carpet-weed family)</b>			
<i>Mollugo cerviana</i>	threadstem carpetweed	Naturalized	fl/fr
<b>Nyctaginaceae (four o'clock family)</b>			
<i>Abronia villosa</i> var. <i>villosa</i>	desert sand verbena	Native	veg/fr
<i>Allionia incarnata</i> var. <i>incarnata</i>	trailing windmills	Native	veg/fl/fr
<i>Boerhavia wrightii</i>	largebract spiderling	Native	fl
<i>Mirabilis laevis</i>	desert wishbone-bush	Native	veg
<b>Onagraceae (evening primrose family)</b>			
<i>Chylismia brevipes</i>	yellow cups	Native	dry
<i>Eremothera boothii</i>	Booth's evening primrose	Native	dry/veg
<i>Eremothera refracta</i>	narrowleaf suncup	Native	dry
<i>Oenothera deltooides</i>	birdcage evening primrose	Native	dry
<i>Oenothera primiveris</i>	desert evening primrose	Native	dry/veg
<b>Plantaginaceae (plantain family)</b>			
<i>Antirrhinum filipes</i>	yellow twining snapdragon	Native	dry
<i>Plantago ovata</i>	desert Indianwheat	Native	dry/veg
<b>Polemoniaceae (phlox family)</b>			
<i>Eriastrum</i> sp.	woollystar	Native	dry



Scientific name	Common name	Nativity <sup>1</sup>	Condition <sup>2</sup>
<i>Gilia latiflora</i>	hollyleaf gilia	Native	dry
<i>Linanthus parryae</i>	sandblossoms	Native	dry
<i>Loeseliastrum</i> sp.	calico	Native	dry
<b>Polygonaceae (buckwheat family)</b>			
<i>Chorizanthe brevicornu</i>	brittle spineflower	Native	dry
<i>Chorizanthe rigida</i>	Devil's spineflower	Native	dry
<i>Eriogonum brachyanthum</i>	shortflower buckwheat	Native	dry
<i>Eriogonum inflatum</i>	desert trumpet	Native	dry/veg
<i>Eriogonum trichopes</i>	little deserttrumpet	Native	veg/fl
<b>Simaroubaceae (quassia family)</b>			
<i>Castela emoryi</i> *	Emory's crucifixion-thorn	Native	fl
<b>Solanaceae (potato family)</b>			
<i>Physalis crassifolia</i>	groundcherry	Native	fl/fr
<b>Tamaricaceae (tamarix family)</b>			
<i>Tamarix chinensis</i>	five-stamen tamarisk	Noxious	fl/fr
<b>Zygophyllaceae (creosote-bush family)</b>			
<i>Larrea tridentata</i>	creosote bush	Native	veg/fr
<b>Monocots</b>			
<b>Agavaceae (century-plant family)</b>			
<i>Hesperocallis undulata</i>	desert lily	Native	veg
<b>Poaceae (grass family)</b>			
<i>Aristida adscensionis</i>	sixweeks threewawn	Native	fl
<i>Bouteloua aristidoides</i> var. <i>aristidoides</i>	needle grama	Native	fl/fr
<i>Bouteloua barbata</i> var. <i>barbata</i>	sixweeks grama	Native	fl/fr
<i>Bromus</i> sp.	brome	Naturalized	dry
<i>Bromus tectorum</i>	cheatgrass	Invasive	dry
<i>Dasyochloa pulchella</i>	fluff grass	Native	veg
<i>Hilaria rigida</i>	big galleta	Native	veg/fr
<i>Schismus barbatus</i>	Mediterranean grass	Invasive	dry

\*Rare species

<sup>1</sup>Native and Naturalized spp. after Baldwin (2012), Invasive and Noxious spp. after Cal-IPC (2012) and CDFA (2012)

<sup>2</sup>dry = dry annual no longer living; fl = flowering; fr = fruiting, veg = vegetative, no flowers or fruits.

## Appendix B

### Rare Plant Species Locations

Species	No. Obs.	Northing <sup>1</sup>	Easting <sup>1</sup>
Emory's crucifixion-thorn	2	3894269.578	575167.849
Emory's crucifixion-thorn	3	3894277.906	575155.900
Utah vine milkweed	10	3893256.878	573946.662
Utah vine milkweed	5	3893242.905	573961.942
Utah vine milkweed	5	3893233.281	574008.805
Utah vine milkweed	5	3893224.567	574043.320
Utah vine milkweed	1	3893224.561	574114.797
Utah vine milkweed	15	3893016.302	574265.283
Utah vine milkweed	1	3893042.510	574338.994
Utah vine milkweed	3	3893054.685	574267.464
Utah vine milkweed	4	3892919.870	573908.323
Utah vine milkweed	12	3893001.188	574564.961
Utah vine milkweed	3	3893176.672	574232.944
Utah vine milkweed	3	3893191.628	574438.518
Utah vine milkweed	1	3893042.472	574339.498

<sup>1</sup>Coordinates provided in UTM NAD 83 Zone 11

**Appendix C**  
**Representative Photographs**



**Photo 1.** Creosote bush scrub vegetation, South Array.



**Photo 2.** Creosote bush-white bursage scrub, South Array.



**Photo 3.** Cheesebush scrub within main wash, South Array.



**Photo 4.** Utah vine milkweed habitat





**Photo 5.** Utah vine milkweed



**Photo 6.** Utah vine milkweed growing on shrub.



**Photo 7.** Utah vine milkweed fruit.



**Photo 8.** Utah vine milkweed flowers.



**Photo 9.** Emory's crucifixion-thorn habitat.



**Photo 10.** Emory's crucifixion-thorn.

## **Appendix D**

### **CNDDDB Field Forms**



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

For Office Use Only

Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work (mm/dd/yyyy): 10/27/2012

Reset

### California Native Species Field Survey Form

Send Form

Scientific Name: Castela emoryi

Common Name: Emory's crucifixion-thorn

Species Found?  Yes  No \_\_\_\_\_ If not, why? \_\_\_\_\_

Total No. Individuals ~5 Subsequent Visit?  yes  no

Is this an existing NDDDB occurrence? \_\_\_\_\_  no  unk.  
Yes, Occ. # \_\_\_\_\_

Collection? If yes: \_\_\_\_\_  
Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

Reporter: Catherine Schnurrenberger

Address: 11331 Star Pine Rd. Truckee, CA 96161

E-mail Address: cadavis@itol.com

Phone: (530) 448-6847

#### Plant Information

Phenology: \_\_\_\_\_% vegetative 100% flowering \_\_\_\_\_% fruiting

#### Animal Information

# adults  # juveniles  # larvae  # egg masses  # unknown   
wintering  breeding  nesting  rookery  burrow site  other

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

Located about 12 miles west of Baker, CA. in the valley between the North Soda Mountains and South Soda Mountains just north of the I-15 corridor.

County: San Bernardino Landowner / Mgr.: BLM

Quad Name: West of Soda Lake Elevation: 1,360 ft.

T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian:  H  M  S  Source of Coordinates (GPS, topo. map & type): GPS

T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian:  H  M  S  GPS Make & Model Trimble Geo XH

DATUM: NAD27  NAD83  WGS84  Horizontal Accuracy < 1m meters/feet

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

Coordinates: 3894269.578 575167.849; 3894277.906 575155.900 See attached GIS shape files for specific point locations.

#### Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

#### Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

The plants were found at the margins of a rocky wash within a large alluvial fan dominated by creosote bush scrub. The aspect is southeast and the slope is about 5 degrees. Associate species include Larrea tridentata, Ambrosia dumosa.

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

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

Immediate AND surrounding land use: Undisturbed alluvial fan. There is a transmission line corridor to the north and OHV use on nearby roads.

Visible disturbances: Natural disturbance due to water flows in the desert wash where the plants are growing.

Threats: Solar energy development planned for this site

Comments: Population previously documented in 2009 Spring survey of this site. The plants occur in two main clumps and the number of stems in each clump is somewhat difficult to estimate due to the very spiny nature of this plant. All shoots observed are staminate, and this population is therefore apparently unable to reproduce via seed. It is likely that all stems are ramets of one genetic individual.

#### Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): Jepson Mauul 2nd edition. (Baldwin 2012)
- Compared with specimen housed at: \_\_\_\_\_
- Compared with photo / drawing in: \_\_\_\_\_
- By another person (name): \_\_\_\_\_
- Other: \_\_\_\_\_

#### Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes  no



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

For Office Use Only

Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work (mm/dd/yyyy): 10/29/2012

Reset

### California Native Species Field Survey Form

Send Form

Scientific Name: *Funastrum utahense*

Common Name: Utah vine milkweed

Species Found?  Yes  No \_\_\_\_\_ If not, why? \_\_\_\_\_

Total No. Individuals 68 Subsequent Visit?  yes  no

Is this an existing NDDDB occurrence? \_\_\_\_\_  no  unk.  
Yes, Occ. # \_\_\_\_\_

Collection? If yes: \_\_\_\_\_  
Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

Reporter: Catherine Schnurrenberger

Address: 11331 Star Pine Rd. Truckee, CA 96161

E-mail Address: cadavis@itol.com

Phone: (530) 448-6847

#### Plant Information

Phenology: 95% vegetative 1% flowering 4% fruiting

#### Animal Information

# adults  # juveniles  # larvae  # egg masses  # unknown   
wintering  breeding  nesting  rookery  burrow site  other

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

Located about 12 miles west of Baker, CA. in the valley between the North Soda Mountains and South Soda Mountains just north of the I-15 corridor.

County: San Bernardino Landowner / Mgr.: BLM

Quad Name: West of Soda Lake Elevation: 1,470 ft.

T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian:  H  M  S  Source of Coordinates (GPS, topo. map & type): GPS

T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4, Meridian:  H  M  S  GPS Make & Model Trimble Geo XH

**DATUM:** NAD27  NAD83  WGS84  Horizontal Accuracy < 1m meters/feet

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

Coordinates: General area is near 3893016.302 574265.283. See attached GIS shape files for specific point locations.

#### Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

#### Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

The plants were found in several rocky washes within a large alluvial fan dominated by creosote bush scrub. The aspect is southeast and the slope is about 5 degrees. Associate species include *Larrea tridentata*, *Ambrosia dumosa*, *Chamaesyce micromera*, *C. polycarpa*, *Senna armata*, *Porophyllum gracile*, and *Bebbia juncea*.

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

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

Immediate AND surrounding land use: Undisturbed alluvial fan. There is a transmission line corridor to the north and OHV use on nearby roads.

Visible disturbances: Natural disturbance due to water flows in the desert washes where the plants are growing.

Threats: Solar energy development planned for this site

Comments: Population previously documented in 2009 Spring survey of this site, but fewer locations found in 2012.

#### Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): Jepson Mauul 2nd edition. (Baldwin 2012)
- Compared with specimen housed at: \_\_\_\_\_
- Compared with photo / drawing in: \_\_\_\_\_
- By another person (name): \_\_\_\_\_
- Other: \_\_\_\_\_

#### Photographs: (check one or more)

Slide	Print	Digital
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Plant / animal	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes  no

## **Appendix E**

### **Botanist Resumes**

## **Catherine Schnurrenberger**

### **Botanist**

C.S. Ecological Surveys and Assessments  
11331 Star Pine Road.  
Truckee, CA  
96161  
(Home) 530-587-6460  
(Cell) 530-448-6847  
CADAVIS@LTOL.COM

### **EDUCATION**

B.S., Range and Wildlands Science, University of California, 1988

M.S., Hydrology, University of Nevada, 2000

### **PROFESSIONAL HISTORY**

As a Botanist and Hydrologist, with expertise in TESC plant surveys, wetland plant ecology and stream restoration, I have use my knowledge of plants and hydrology to design, evaluate and direct restoration projects, provide botanical services for wetland delineations and to conduct botanical surveys for plants listed as Threatened, Endangered and Species of Concern, hereafter referred to as TESC species. I have worked with local, state and federal agencies, Universities, private businesses and non-profit organizations on interdisciplinary research and restoration projects. I have compiled and analyzed ecological and hydrological data, and written reports for stream restoration projects. I have conducted wetland delineations in California and Nevada. I have reviewed and written best management practices (BMP's) and Storm Water Pollution Prevention Plans (SWPPP's) for construction projects. I have also prepared Constraint's Analysis Reports, Environmental Assessment Reports and portions of Environmental Impact Statements.

JBR Environmental 2010 – 2012 (Project hire)

Garcia and Associates 2010 – 2012 (Part time)

C.S. Ecological Surveys and Assessments, Botanist 2008 - 2012

Integrated Environmental Restoration Services (IERS), Plant Ecologist 2006 - 2008

JBR Environmental Consultants, Inc., Botanist, 2001 - 2005

Self-Employed, Botanist, 1998 - 2001

North State Resource Inc., Botanist, 1996 - 1998

Ecotono, Botanist, 1995 - 1996

National Biological Service, Botanist 1995

Self-Employed, Botanist 1992 - 1994

Modoc National Forest, Botanist, 1992

University of California, Graduate Researcher, 1990

Plumas National Forest, Range Technician, 1989

### **Botanical Surveys**

I have conducted numerous surveys for TESC species throughout northern and southern California and the Great Basin (Nevada). These surveys have been floristic in nature, meaning that all plants encountered were identified to the species level, when phenology allowed. I have coordinated projects with the USFS, BLM, CDFG, as well as private companies and non-profit organizations. I have worked in the Mojave and Sonoran Deserts and in the southern Sierra/ Tehachapi Mountain area. I have been the field lead and project manager on surveys as well as a participating field botanist. A list of selected plant surveys is included below.

### **Vegetation Studies**

I have participated in numerous vegetation baseline studies. My experience includes studies or surveys used for academic research, environmental permitting, and restoration. My experience includes surveys in California, Nevada, Utah, Oregon, and Alaska.

While working for the National Biological Service, I conducted all of the botanical fieldwork on a pilot study to evaluate the effectiveness of using satellite imagery to determine plant communities. I worked as the primary Botanist conducting riparian surveys for the Modoc National Forest Service. While at the University of Nevada, Reno I conducted the botanical work for the “Great Basin Ecosystem Management Project” run by the USFS Rocky Mountain Research Station.

### **Wetland Delineation and Permitting**

I have been involved in numerous wetland and waters of the United States delineations performing them in accordance with the U.S. Army Corps of Engineers 1987 Manual. These delineations were located throughout Nevada, California and Oregon, for clients involved in agricultural, mining and urban development. These projects ranged in size from a few to several hundred acres. Many of these projects included long term monitoring of restored wetlands.

### **Riparian Monitoring**

I have been involved in riparian monitoring projects and aquatic plant inventories for non-profit groups, government agencies and private industries. I have worked on projects accessing existing riparian condition and health, and the evaluating the success of riparian restoration projects. I have worked with geomorphologists, hydrologists and engineers on such projects. These projects have been located throughout the Great Basin, Lake Tahoe, the Northern Sierra Nevada, the Modoc Plateau, Santa Cruz, CA and various other locations in California. My Master’s work, evaluating the impact of side valley alluvial fans in the mountains south of Austin Nevada on the stability or riparian plant communities, focused on the relationship between fluvial geomorphology and riparian ecology. Prior to my Master’s work I worked with the USFS conducting condition and trend studies and baseline inventories on meadows and riparian areas. This work involved collecting quantitative data on plant cover and frequency using the line intercept, nested rooted frequency, and cover point methods.

### **Rangeland Monitoring**

I have training and experience in evaluating rangeland health. I have conducted monitoring of rangelands throughout California and Nevada. These studies included utilization monitoring, long term ecological trend monitoring, evaluation of rangeland health, monitoring of riparian impacts and impacts to TESC species. I have worked for government agencies, University research facilities, private consulting companies, and non-profit organizations while performing rangeland monitoring. During my work with North State Resources, I conducted a nine-month survey of all historic and existing USFS rangeland in Northwestern California. This data was used to determine long term trends in rangeland condition and health on public lands. While working with CalTrout I conducted fieldwork, compiled data, and wrote a report on the grazing practices within the Golden Trout Wilderness (USFS land). This report was used to determine the suitability of the area for continued grazing. I also collected the data for and wrote the section on grazing history for the Sierra Nevada Ecosystem Project (1996). In 2003 and 2009 I managed a vegetation monitoring project within the Bruneau River Basin in northeastern Nevada that assessed impacts of cattle, elk, deer, antelope and wild horses to plant communities. In 2006 and 2007 I managed an extensive survey of rangeland utilization by ungulates (cattle, elk, deer and antelope) on BLM land in northeastern Nevada. In 2005 I worked under contract with the Natural Resource Conservation Service (NRCS) conducting monitoring to assess the condition of private rangeland throughout central and northern Nevada.

### **Mine Reclamation Work**

I have designed and conducted vegetation sampling on reclaimed mine lands near Elko, Hawthorne, Winnemucca, and Battle Mountain, NV. This work included establishing representative areas for baseline sampling, selecting re-vegetation techniques (including soil preparation, selection of re-vegetation species and seeding and planting methods), and developing and conducting long term monitoring to assess the success of re-vegetation projects in accordance with established monitoring protocols.

### **Supplemental professional training, and Certification**

Qualified Botanist with Las Vegas Office of BLM, and Palm Springs South Coast Office of BLM.

## SELECTED PLANT SURVEYS:

- 2012 Conducted field work for and wrote the "Specialist Report for Botanical Resources" along a proposed NV Energy Transmission Line for Carson Ranger District of Humboldt-Toiyabe National Forest, NV
- 2012 Vegetation Mapping Hycroft Mine Winnemucca, NV
- 2012 TESC Survey Ann Barite Mine Toquima Mountains, NV
- 2012 TESC plant survey for Terra Gen Wind Farm Tehachapi, CA
- 2012 TESC plant survey for Southern California Edison, Blyth to Palm Springs CA
- 2012 Constraints Analysis for Reno Technology Park, Tracy, NV
- 2011 Wetland delineation for Tahoe City Golf Course, Tahoe City CA
- 2011 Wetland delineation and TESC plant survey for Placer County Tahoe City, CA
- 2011 TESC Plant surveys for Loma Verde Solar Project near Blyth, CA.
- 2011 TESC Plant surveys, including Coachella Valley Milkvetch, for Painted Hills Wind Farm, North of Palm Springs, CA
- 2011, 2012 TESC and Noxious weed and aquatic plant surveys for the Nature Conservancy at Independence Lake, CA
- 2011 Seep, wet meadow and fen inventory for the Nature Conservancy at Independence Lake CA
- 2011 Aquatic weed survey for PG&E Stanislaus NF and Sequoia NF, CA
- 2011 Noxious and Invasive weed survey PG&E Stanislaus-Spring Gap, CA
- 2011 TESC plant surveys for PG&E North Fork Feather River, Plumas County, CA
- 2011 TESC plant surveys Wind Farm development Tehachapi, CA
- 2011 Constraints Analysis for PG&E transmission line repair Chico, CA
- 2011 Biological survey and report for Homewood Recreational Path, Lake Tahoe CA
- 2011 Wetland and WOUS delineation North Palm Springs, CA
- 2010 Conducted Aquatic Plant Inventory for The Nature Conservancy at Independence Lake, CA
- 2010 Conducted Baseline Inventory of Wetland Vegetation for a Geothermal project north of Austin, NV.
- 2010 Conducted a Wetland Delineation and an Inventory of Riparian Vegetation for a Geothermal project near Tuscarora, NV.
- 2009 TESC and Noxious weed plant survey Tahoe Donner Association, Truckee, CA
- 2009 TESC and Noxious weed survey Truckee Tahoe Airport District, Truckee, CA
- 2009 Conducted an Inventory of Riparian Vegetation at Spooner Summit, Lake Tahoe CA.
- 2009 Summary of Riparian Vegetation types and condition Ladies Canyon, CA
- 2008 Plant identification for Caltrans D & D project Tahoe Basin and Truckee, CA and NV
- 2007 Designed and implemented riparian restoration project for North Star at Tahoe Ski Resort, CA.
- 2007 Baseline vegetation and WOUS surveys for Turquoise Joint Venture Mine, Winnemucca, Nevada
- 2006-2007 Baseline vegetation, TESC and WOUS surveys for Nevada Power, Ely, NV
- 2006 Baseline vegetation, TESC and Noxious Weed survey for SBC, Ely, NV
- 2005-2006 Baseline vegetation, TESC and Noxious Weed survey for Northern Pacific Railway, Portola, CA
- 2005-2006 Baseline vegetation, TESC and Noxious Weed survey for City of Truckee, Truckee, CA
- 2004-2007 Baseline vegetation TESC and Noxious Weed survey Borealis Mine, Hawthorne, NV
- 2005 TESC and Noxious Weed surveys SBC, Pahrump, NV
- 2005 Baseline vegetation and WOUS surveys Cortez Gold Mine, Crescent City, NV
- 2005 Rangeland condition study Natural Resource Conservation Service (NRCS), NV
- 2005 Baseline vegetation and TESC survey Monarch Mine, Kern County, CA
- 2004-2005 Conducted Inventory of wetland and riparian vegetation at Kirkwood Ski Resort, CA.
- 2004 Baseline vegetation and TESC survey Pinyon-Railroad Mine, Pinyon Range, NV
- 2004 Baseline vegetation, TESC and WOUS survey Tonkins Springs Mine, Simpson Park mountains, NV
- 2004 TESC and WOUS survey Placer County, Talmont, CA
- 2003- 2005 Conducted all vegetation surveys for Damonte Ranch wetland monitoring, Reno, NV.
- 2003-2004 Baseline vegetation, TESC, WOUS and Noxious Weed surveys Kirkwood Ski area, El Dorado National Forest, CA
- 2003-2004 Conducted monitoring of wetland and riparian restoration at Mt. Rose Ski Resort, NV.
- 2003 Study of Pinyon pine die off Cortez Gold Mine, Crescent City, NV
- 2003 WOUS survey Portland, Oregon
- 2003 Baseline vegetation and TESC survey, Shanty Town, Ruby Mountains, NV
- 2002-2003 Baseline vegetation and TESC survey Hecla Mine, Lander County, NV
- 2002-2003 Baseline vegetation, TESC, WOUS and Noxious Weed surveys of proposed transmission line, Sierra Pacific Power, Pinenut Mountains, NV
- 2002 Baseline vegetation, TESC and Noxious Weed surveys eastern sierra, Carson, NV
- 2002 Baseline vegetation survey, TESC and Noxious Weed surveys, U.S.M.C. Mountain Warfare Training Center, Toiyabe National Forest, CA.
- 2002 Conducted an Inventory of Riparian Vegetation along Thomas and White's Creek for the purpose of river restoration, Reno, NV.

# EDWARD K. KENTNER, PH.D.

## BOTANIST

1917 S. Myers St Apt. D  
Oceanside CA., 92054

559-281-7171  
edkentner@lavabit.com

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### EDUCATION

Humboldt State University, Arcata CA.	B.S. Botany, 1995
Humboldt State University, Arcata CA	M.A. Biology, 1997
University of Georgia, Athens GA	Ph.D. Genetics, 2004

### EXPERIENCE

Dr. Kentner is a botanist specializing in the flora and vegetation communities of California. He has conducted and led botanical surveys for many projects located throughout the state, and has training and experience in vascular plant taxonomy, vegetation classification and mapping, and wetland delineation. Most recently, he has led the botanical survey efforts for several large renewable energy and infrastructure developments in the Southern California deserts, the Tehachapi Mountains, and the Southern Sierra Nevada Mountains. Dr. Kentner is equally comfortable conducting field surveys, designing and implementing GPS / GIS data collection strategies, producing GIS maps, and serving as the primary author of technical reports and permit applications. Dr. Kentner is skilled in all aspects of environmental document production and technical editing, and has authored or contributed to many types of environmental documents.

### TRAINING AND CERTIFICATIONS

- U.C. Davis Extension, Endangered Species Regulation, 2007
- U.C. Davis Extension, CEQA Regulation, 2007
- Wetland Training Institute, Basic Wetland Delineation, 2007
- Wetland Training Institute, Advanced Soils and Hydrology, 2007
- Desert Tortoise Council, Tortoise Handling Workshop, 2011
- CDFG Scientific Collection Permit for State-listed plants; 2081(a)-10-02-V

### PUBLICATIONS

Kentner, E. K., Arnold, M. L. and S. R. Wessler, 2003 Characterization of high-copy-number retrotransposons from the large genomes of the Louisiana Iris species and their use as molecular markers. *Genetics* 164: 685–697.

Kentner, E. K., and M. R. Mesler, 2000 Evidence for natural selection in a fern hybrid zone. *American Journal of Botany* 87: 1168-1174.

Hiatt, E. N., E. K. Kentner and R. K. Dawe, 2002 Independently regulated neocentromere activity of two classes of tandem repeat arrays. *Plant Cell* 14: 407-420.

Arnold, M. L., E. K. Kentner, J. A. Johnston, S. Cornman and A. C. Bouck, 2001 Natural hybridization and fitness. *Taxon* 50: 93-104.

### PROFESSIONAL HISTORY

2012 to present	Independent consulting biologist, Oceanside CA.
2009 to 2011	Garcia and Associates, Oceanside CA: Senior Botanist and Project Manager
2008	Geographic Resource Solutions, Arcata CA: Botanist
2006 – 2008	H. T. Harvey & Associates, Fresno CA: Plant Ecologist
2005 – 2006	California Native Plant Society Vegetation Program, Sacramento CA: Team Leader
1999 – 2004	University of Georgia, Athens GA: Ph.D. Graduate Studies
1998	College of the Redwoods, Eureka CA: Adjunct Instructor (Botany)
1997	U.S. Forest Service, Cottage Grove, OR: Biological Science Technician
1995 – 1997	Humboldt State University, Arcata CA: Teaching Assistant (Plant Taxonomy & Botany)
1994 – 1995	U.S. Forest Service, Paulina OR: Biological Science Technician and Botanist



**SELECTED PROJECT EXPERIENCE**

- 2012**      **Vegetation Classification of Orange Co.** County wide. Conducted over 300 vegetation surveys throughout the county using the CNPS/CDFG Vegetation Rapid Assessment survey protocol. Coordinated with many public and private land managers for access to land and properties. The data collected will be used to generate a new vegetation classification and vegetation map for the county. I will participate in the data analysis and classification during the Fall of 2012.
- 2012**      **Desert Renewable Energy Conservation Plan (DRECP).** California Deserts. Served as an independent scientific reviewer of species profiles and habitat models for nine species covered under the Plan.
- 2012**      **Bright Star Canyon Wind Energy Project. Kern Co.** 8,756 acres. Lead botanist for protocol-level floristic surveys in desert transitional and montane habitats in the southern Sierra Nevada Mountains. Managed the GIS mapping of rare plants and invasive weeds using field-collected GPS data and aerial photographs. Primary author of the technical report describing the survey results.
- 2012**      **Highwinds Substation Botanical Surveys. Kern Co.** ~40 acres. Conducted protocol-level botanical surveys in desert transitional habitats. Prepared technical memo describing the survey results.
- 2012**      **North Sky River Wind Energy Project.** 6,150 acres. Provided on-call support services for rare plant and wetland surveys for project revisions and changes immediately prior to construction. Prepared several technical memos documenting the survey results.
- 2011**      **Station Fire Reforestation Surveys. Los Angeles Co.** 2,000 acres. Conducted botanical surveys for rare and sensitive plant species in burned areas within the Angeles National Forest. Collected rare plant data on standard Forest Service forms for numerous occurrences of several rare plant species, and delivered GIS shape files mapping the survey results.
- 2011**      **Colorado River Substation. Riverside Co.** 1,150 acres. Lead botanist for protocol-level floristic surveys in Sonoran Desert scrub and dune habitats. Produced GIS map of rare plant and invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.
- 2011**      **Loma Verde Solar Energy Project. Riverside Co.** 650 acres. Lead botanist for protocol-level floristic surveys in disturbed Sonoran Desert habitats. Produced GIS map of invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.
- 2011**      **Morgan Hills Wind Energy Project. Kern Co.** 2,335 acres. Lead botanist for protocol-level floristic surveys in Mojave Desert scrub and desert-transitional woodland habitats in the Tehachapi Mountains. Managed the GIS mapping of rare plant and invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.
- 2011**      **Alta East Wind Energy Project. Kern Co.** 920 acres. Lead botanist for protocol-level floristic surveys in Mojave Desert scrub habitats. Managed the GIS mapping of rare plant and invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.
- 2011**      **Southwest Wind Energy Project. Kern Co.** 3,770 acres. Lead botanist for protocol-level floristic surveys in Mojave Desert scrub and desert-transitional woodland habitats in the Tehachapi Mountains. Managed the GIS mapping of rare plant and invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.
- 2011**      **Alta Wind Infill II Wind Energy Project. Kern Co.** 1,300 acres. Lead botanist for protocol-level floristic surveys in Mojave Desert scrub habitats. Managed the GIS mapping of rare

plant and invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.

- 2011** **Devers Substation. Riverside Co.** 35 acres. Conducted protocol-level floristic surveys in desert scrub habitats; primary author of the technical report describing the survey results.
- 2011** **Painted Hills Wind Energy Project. Riverside Co.** 65 acres. Technical advisor for botanists conducting protocol-level floristic surveys in desert scrub habitats. Managed the GIS mapping of rare plant and invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.
- 2010-2011** **Alta-Oak Creek Mojave Wind Energy Project. Kern Co.** ~2,500 acres. Lead botanist for protocol-level floristic surveys in Mojavean desert scrub habitats. Managed the GIS mapping of rare plant and invasive weed occurrences using field-collected GPS data. Primary author of the technical report describing the survey results.
- 2010-2011** **North Sky River Wind Energy Project. Kern Co.** 6,150 acres. Lead botanist for protocol-level floristic surveys, vegetation mapping, and wetlands assessment in Mojavean desert scrub, desert transitional and montane habitats in the southern Sierra Nevada Mountains. Managed the GIS mapping of rare plants, invasive weeds, vegetation communities, and potential jurisdictional wetlands using field-collected GPS data and aerial photographs. Primary author of the technical reports describing the survey results.
- 2010-2011** **Deteriorated Pole Replacement Projects. Los Angeles, Riverside and San Bernardino Cos.** Project manager for several projects involving the biological review of deteriorated wooden utility poles located in various locations throughout southern California.
- 2010** **El Dorado-Ivanpah Transmission Project. San Bernardino Co. and Clark Co., NV.** 65 linear miles. Lead teams of ecologists conducting a jurisdictional delineation of desert wash habitats in eastern California and Nevada. Managed the GIS mapping of USACE and CDFG jurisdictional habitats using field-collected GPS data. Primary author of the jurisdictional delineation report.
- 2010** **Morongo Relocation Project. Riverside Co.** 17 linear miles. Lead botanist for protocol-level floristic surveys, vegetation mapping, and preliminary wetlands assessment in desert scrub and desert-transitional habitats along a 17 mile transmission line route. Primary author of the botanical survey and wetland reports.
- 2009** **Broadwell Lake Solar Energy Project. San Bernardino Co.** ~20 square miles. Served as a member of a large team of botanists conducting protocol-level floristic surveys for this large-scale solar project in the central Mojave Desert.
- 2009** **Barren Ridge Renewable Transmission Project. Angeles National Forest, Los Angeles Co.** ~15 linear miles. Conducted protocol-level floristic surveys in desert scrub habitats; primary author of the 2009 technical report describing the results of surveys conducted that year.
- 2009** **Pacoima Canyon Road Repair Project. Angeles National Forest, Los Angeles Co.** 25 linear miles. Conducted floristic surveys and prepared GIS maps of rare plants and invasive weed occurrences. Coordinated with Angeles National Forest personnel to ensure that the survey methodology, data collection, and reporting conformed to Forest Service requirements. Primary author of the technical report.
- 2009** **Power Plant No. 2 Tailings Removal Project. Angeles National Forest, Los Angeles Co.** ~2 acres. Conducted floristic surveys and prepared GIS maps of rare plants and invasive weed occurrences. Coordinated with Angeles National Forest personnel to ensure that the survey methodology, data collection, and reporting conformed to Forest Service requirements. Primary author of the technical report.
- 2009** **Bee Canyon Aqueduct Maintenance Project. Angeles National Forest, Los Angeles Co.** ~3 acres. Conducted floristic surveys and prepared GIS maps of rare plants and invasive weed occurrences. Coordinated with Angeles National Forest personnel to ensure

that the survey methodology, data collection, and reporting conformed to Forest Service requirements. Primary author of the technical report.

- 2009** **Haskell Canyon Proposed Borrow Pit. Angeles National Forest, Los Angeles Co.** ~5 acres. Conducted floristic surveys and prepared GIS maps of rare plants and invasive weed occurrences. Coordinated with Angeles National Forest personnel to ensure that the survey methodology, data collection, and reporting conformed to Forest Service requirements. Primary author of the technical report.
- 2009** **Lytle Creek Road Repair Project. San Bernardino National Forest, Los Angeles Co.** 3 linear miles. Conducted floristic surveys and prepared GIS maps of rare plants and invasive weed occurrences. Coordinated with San Bernardino National Forest personnel to ensure that the survey methodology, data collection, and reporting conformed to Forest Service requirements. Primary author of the technical report.
- 2009** **Pine Tree Wind Energy Project. Kern Co.** ~10 acres. Conducted floristic surveys and prepared botanical section of the technical report describing the survey results.
- 2009** **Mokelumne Hydroelectric Relicensing Project. Amador, Calaveras, and Alpine Cos.** Collected riparian vegetation monitoring data at established monitoring stations in the Sierra Nevada Mountains of California and produced a statistical comparison of habitat conditions between monitoring years in support of FERC relicensing requirements. Primary author of the report detailing the monitoring results.
- 2009** **Templeton - Common Neutral Reconductoring Project. San Luis Obispo Co.** 1 linear mile. Conducted habitat and botanical surveys in support of a biological constraints analysis.
- 2009** **Cabrillo-Santa Ynez Reconductoring Project. Santa Barbara Co.** 15 linear miles. Conducted habitat and botanical surveys in support of a biological constraints analysis.
- 2007** **Ivanpah Solar Electric Generating System. San Bernardino Co.** Served as a member of a large team of botanists conducting protocol-level floristic surveys for this large-scale solar project in the eastern Mojave Desert.
- 2007** **Tehachapi Renewable Transmission Project. Los Angeles Co. and Kern Co.** ~250 linear miles. Botanical survey coordinator responsible for directing teams of botanists and subcontractors in conducting rare plant surveys of existing and proposed transmission line corridors spanning the Antelope Valley, San Gabriel Mountains, San Gabriel Valley, and Chino/Puente Hills. Produced a revised vegetation map using ArcMap GIS software, completed a noxious weed inventory within the Angeles National Forest, and contributed to several sections of the Environmental Impact Report.
- 2009** **Rock Creek – Cresta Hydroelectric Relicensing Project. Plumas Co.** Statistically analyzed riparian vegetation monitoring data and co-authored a report describing changes in riparian habitat conditions over a 5 year monitoring period within the Rock Creek watershed in the Sierra Nevada Mountains of California. The work was carried out in support of FERC relicensing requirements.
- 2008** **Vegetation Classification of Redwood National and State Parks. Humboldt and Del Norte Cos.** Lead botanist / vegetation ecologist for vegetation sampling within Redwood National and State Parks. The goal of the project was to classify and map all of the vegetation communities occurring within the park.
- 2007** **Robidart Ranch Proposed Vernal Pool Conservation Easement. San Joaquin Co.** 300 acres. Prepared a wetland delineation and floristic inventory of vernal pools, seasonal wetlands, and swales habitats on a proposed easement. Prepared GIS maps of rare plants and wetlands using high resolution aerial photography and ArcMap GIS software. Primary author of the botanical and jurisdictional delineation reports.
- 2007** **Highlands Ranch at Quartz Hill Housing Development. Los Angeles Co.** ~15 acres. Conducted reconnaissance-level botanical surveys and delineated CDFG-jurisdictional

desert wash habitats. Prepared the botanical survey report and the application for a Stream Alteration Agreement with CDFG.

- 2007** **Lancaster Office Depot. Los Angeles Co.** ~2 acres. Delineated CDFG-jurisdictional desert wash habitats and prepared the application for a Stream Alteration Agreement with CDFG.
- 2007** **Armagosa Creek Project. Los Angeles Co.** ~10 acres. Delineated CDFG-jurisdictional desert wash habitats and prepared the application for a Stream Alteration Agreement with CDFG.
- 2005-2006** **Vegetation Classification of the Northern Sierra Nevada Foothills. From Shasta Co. south to Madera Co.** Led teams of botanists in the collection of field data for the Northern Sierra Foothills Vegetation Classification project which spanned the Sierra Foothills from Madera County north to Shasta County. Analyzed vegetation data and collaborated with California Department of Fish and Game and California Native Plant Society ecologists to classify vegetation alliances and associations to national and international standards. Assisted in the collection, identification, and archiving of nearly 2000 voucher specimens, prepared technical reports describing vegetation communities, and presented vegetation classification research at a public scientific meeting.
- 1997** **Biological Science Technician, Umpqua National Forest. OR.** Conducted surveys for threatened and endangered vascular plant species, compiled lists of species occurring along transects, mapped populations of plant species using aerial photographs and topographic maps, and collected native seed for use in restoration projects.
- 1994-1995** **Botanical Surveys Ochoco National Forest. OR.** Conducted surveys for threatened and endangered vascular plant species, compiled lists of species occurring along transects, mapped populations of plant species using aerial photographs and topographic maps, and participated in wildland firefighting efforts on the forest.

**Jason Brooks**  
**Botanist**  
2988 Diane St  
Ashland, OR, 97520  
(541)941-5579

**EXPERTISE** Rare plant surveys  
Bryophyte and lichen surveys  
Fungi surveys  
Noxious weed surveys  
Vegetation community mapping  
Mobile GIS technology

**EDUCATION** Bachelor of Science, Botany. Northern Arizona University, 1997

**RELEVANT  
COURSEWORK**

Ornithology  
Plant Taxonomy  
Plant Morphology  
Bryophytes and Lichen Identification  
Bryophytes and Lichens of the North Cascades  
Topics in Ecology  
Conservation Biology  
Mammalogy  
Aquatic Ecology

**PROFESSIONAL  
EXPERIENCE**

Mr. Brooks is a consulting botanist with fourteen years of experience implementing botanical studies and wildlife investigations. During his career he has conducted field investigations throughout the states of California, Oregon, Arizona, Utah and Nevada in a variety of biological communities. These include valley grassland, oak woodland, riparian woodland, coastal sage scrub, interior chaparral, vernal pool, tidal salt marsh, alpine barrens, Sierran, Klamath, and Siskiyou forest types. Desert investigations include Mojave, Great Basin and Sonoran deserts. He has conducted site investigations, investigated rare plant occurrences, evaluated habitat for special status plant and animal species, performed habitat analyses and evaluations, and mapped vegetation types. Specific project experience includes:

**Cascade, Siskiyou, Klamath and Sierra Nevada Mountain Ranges**

**\*Current\*-Rare plant and fungi surveys, Willamette and Hood National Forests.** Member of a large team of botanists conducting field surveys for Portland Gas & Electric for a new transmission line through the Cascades in northern Oregon. Duties include identification of all vascular, nonvascular, lichen and fungi located. Additional duties include field coordination of crews, compilation of data, and compound

microscopy. In addition Mr. Brooks is conducting a separate investigation to collect and identify all bryophytes of the Breitenbush drainage to add to the collections at the herbarium at Southern Oregon University. Notable bryophyte collections include Forest Sensitive species, *Myurella julacea*, *Plagiothecium piliferum*, *Tetrapolodon mnioides*, and *Tayloria serrata*. In addition a new species of the liverwort *Marsupella nova* in ed. “(*cascadensis*)”. In addition two new species from the fungi genus *Ramaria* were discovered by the team though these have yet to be described. Notable range extensions were found in several lichen species including *Melanelia comixta*, *Umbilicaria rigida*, and *Umbilicaria havaasii*.

**\*Current\*-Bryophyte identification, Tahoe, Sierra, Inyo, Humboldt National Forests.** Responsible for identification of all field collections from a variety of consulting firms. Bryophytes are collected over many habitats and over many different mountain ranges throughout California and Nevada. Duties include compound microscopy, and report writing.

**\*Current\*-Rare bryophyte, vascular and lichen surveys for the BLM in Medford, Roseburg, Eugene, and Salem districts.** Member of a small team of botanists that have been surveying small to large forested areas over all of western Oregon for the past five years. Target species are vascular and nonvascular species as well as lichens. During this work many new state records and range extensions have been found including the lichen species *Ramalina intermedia* (previously unknown in the lower 48 states). Outstanding bryophyte discoveries include *Gymnostomum calcareum* var. *viridula*, *Tortella tortuosa*, *Ditrichum flexicaule*, *Ditrichum* “nova”, *Campylopodia flagellacea*, *Plagiothecium piliferum*, and *Pseudoleskeella* “nova”. Outstanding vascular discoveries include many new populations of the federally endangered *Fritillaria gentneri* (FE), and the only known population of *Arctostaphylos hispidula* (ONHP List 2) known from the Medford BLM district.

**Rare plant surveys, Piute Mountains, Southern Sierra Nevada, CA.** Member of a small team of botanists working over a two year period to determine feasibility of a new wind facility in the Piute Mountains near Tehachapi, CA. Duties included identification of all plant and bryophyte species found within the project area as well as cataloging and mapping of all rare taxa. During the survey Mr. Brooks discovered what is now considered a new species to California *Triteleia* “nova” in ed. “(*piutensis*)”. In addition the team discovered the third known population of *Eriogonum kennedyi* var. *pinicola* (CNPS 1B.1) known in California. Additional species of note include *Allium shevockii* (CNPS 1B.3) and *Eriastrum tracyi* (CNPS 1B.2).

**Environmental assessment, biological evaluation, Shasta Trinity National Forest.** Was a member of an interdisciplinary team in conjunction with the Shasta Trinity National Forest to write an environmental assessment for road closures on the forest. During this process Mr. Brooks was responsible for writing the biological evaluation for forest sensitive plant species occurring within the project area.

**Rare plant surveys, Cascade Siskiyou National Monument, OR.** Completed a two year project to census all rare plant occurrences (both vascular and non-vascular) within the 50,000 acre Cascade Siskiyou National Monument. During the two year study Mr. Brooks had documented over 100 rare plant sites and the team as a whole over 300 within the first year (2007).

**Mollusk Surveys, Rogue Siskiyou National Forest, OR.** Beginning in 2006 Mr. Brooks and several wildlife biologists began surveying the Ashland watershed of the Siskiyou Mountains in southern Oregon for the extremely rare mollusk species *Monadenia chaceana*. The team surveyed 8,000 acres and found three new populations of this terrestrial mollusk in addition to documenting several species previously unknown in the area.

**Rare plant surveys, Middle Fork of the Stanislaus River, CA.** In support of PG&E's FERC relicensing project, Mr. Brooks coordinated and performed rare plant surveys throughout the project area, provided vegetation maps of the project area, and contributed to the final report to the US Forest Service. Mr. Brooks located one new population of mountain lady's slipper (*Cypripedium montanum* CNPS 4), and relocated several additional known rare plant populations.

**Small mammal trapping, Lake Tahoe, CA.** Performed small mammal trapping transects for the US Forest Service around the Lake Tahoe basin. This study is part of an ongoing yearly investigation to census small mammals in this area, as well as discovering habitat partitioning among different species of chipmunks, squirrels and mice. Project involved laying out large Sherman trap grids, checking these grids twice per day and taking a series of measurements and observations on all animals captured.

**Noxious weed surveys, North Fork of the Feather River, CA.** This survey was part of PG&E's requirements determined by the Federal Energy Re-licensing committee (FERC) for the rock creek-cresta hydroelectric project. Mr. Brooks performed surveys for noxious weeds on a ten mile stretch of the North Fork of the Feather River. The project utilized highly innovative IPAQ units equipped both mobile GPS and GIS technologies to accurately and quickly map weed occurrences.

### Mojave Desert

**Rare plant surveys, Spring Mountains, NV.** Conducted rare plant surveys in support of a gas line crossing the Spring Mountains that would support a new solar facility in the Pahrump Valley of southern Nevada. Duties included determination of all species encountered during the survey and subsequent mapping of rare plant taxa. During the survey Mr. Brooks discovered three new populations of the *Eriogonum heermannii* var. *clokeyi* (BLM-SEN).

**Rare plant surveys, Ivanpah Valley, CA.** Conducted rare plant surveys just east of the Clark Mountains outside of the Mojave National Preserve to determine feasibility of a new solar installation. In addition to collecting survey data, Mr. Brooks was a crew leader for this project and was responsible for coordinating field personnel on a daily basis. During the survey Mr. Brooks and his crew discovered new populations of desert pincushion (*Coryphantha chlorantha* CNPS 2), Mojave milkweed (*Asclepias nyctaginifolia* CNPS 2), nine awned pappus grass (*Enneapogon desvauxii* CNPS 2), Rusby's desert-mallow (*Sphaeralcea rusbyi* var. *eremicola* CNPS 1B), and Utah milkvine (*Cynanchum utahense* CNPS 4).

**Rare plant surveys, Kern pipeline, NV.** Mr. Brooks coordinated and performed rare plant surveys for the second Kern pipeline project beginning in Mesquite NV, and terminating in Bakersfield, CA. The project involved searching for new populations of

special status plant species as well as characterization of all plant association types. During the survey Mr. Brooks located new populations of the Las Vegas bear poppy (*Arctomecon merriamii*, CNPS 2), three-cornered milkvetch (*Astragalus geyeri* var. *triquetrus* NNPS-threatened), and rosy two-toned beardtongue (*Penstemon bicolor* ssp. *roseus* CNPS 2).

**Rare plant and desert tortoise surveys, US Borax, CA.** Performed tortoise surveys and vegetation analysis for two separate expansion projects for the US Borax company in Boron California. These surveys have occurred five times over a six year period and are still ongoing. These surveys also included searching for the watch list species Mojave spineflower (*Chorizanthe spinosa* CNPS 4) of which several populations were encountered.

**Rare plant and desert tortoise surveys, Needles CA.** Performed desert tortoise and rare plant surveys for Pacific Gas & Electric on numerous occasions over a four year period documenting all federal and state listed plant and wildlife species.

**Rare plant and desert tortoise surveys, Twentynine Palms, CA.** This project was the baseline study in an ongoing two year investigation studying the effects of relocation on desert tortoise within the military reservation. Duties for the baseline study were protocol USFWS surveys for both plants and tortoise over the 2000 acre project area.

### **Sonoran Desert**

**Rare plant surveys, Blythe, CA.** Performed rare plant surveys over an 8000 acre site in support of a new solar facility new Blythe California. Duties included recording all plant species detected during the surveys and mapping and cataloging all rare plant species found. During the survey Mr. Brooks found many populations of *Astragalus insularis* var. *harwoodii* (CNPS 2.2), and *Eriastrum harwoodii* (CNPS 1B.2).

**Rare Plant and Wildlife Habitat Assessment, Blythe CA.** One member of an interdisciplinary team working on site location of transmission line towers for a new transmission line for LADWP. Responsible for determination of suitable habitat for special status species as well as identifying previously unknown occurrences of these species during the reconnaissance survey.

**Habitat Assessment, US Border Patrol, Southern Arizona.** Part of an interdisciplinary team that determined environmental impacts to “sky island” and desert mountain ranges across the US-Mexico border in southern Arizona. Duties included evaluating potential habitat for rare plant species on remote peaks for radio transmission tower upgrades.

### **Sierra Nevada Foothills and Central Valley**

**Rare Plant Surveys, DeSabra-Centerville CA.** Mr. Brooks performed rare plant surveys in support of PG&E’s FERC relicensing project for the Desabra-Centerville hydroelectric projects located on Butte Creek near Chico California. During this survey many new populations of Butte County Mourning Glory (*Calystegia atriplicifolia* ssp. *buttensis* CNPS 1B), white stemmed clarkia (*Clarkia gracilis* ssp. *albicaulis*), shield-



bracted monkeyflower (*Mimulus glaucescens*) and Jepson's onion (*Allium jepsonii* CNPS 1B) were located

**Rare plant surveys, East Park Reservoir, CA.** Performed surveys for special status plants for the U.S. Bureau of Reclamation to determine the feasibility of turning the facility over to the US Forest Service for management. Many new populations of extremely rare plants were found including Colusa layia (*Layia septentrionalis* CNPS 1B), red flowered bird's foot (*Lotus rubriflorus* CNPS 1B), Brandegee's eriastrum (*Eriastrum brandegeae* CNPS 1B), and adobe-lily (*Fritillaria pluriflora* CNPS 1B).

### **Coastal Communities of California**

**Rare plant surveys, Otay mesa, CA.** Performed a series of 3 rare plant surveys for the Otay mesa (San Diego, CA) for a new CalTrans right-of-way. The project located many rare species in the 1000 acre parcel, including the narrow endemic variegated dudleya (*Dudleya variegata* CNPS 1B), San Diego button celery (*Eryngium aristulatum* var *parishii* CNPS 1B), San Diego goldenstar (*Muilla clevelandii* CNPS 1B), Munz's sage (*Salvia munzii* CNPS 2), San Diego barrel cactus (*Ferocactus viridescens* CNPS 2), San Diego County viguiera (*Viguiera laciniata* CNPS 4), and small-flowered morning glory (*Convolvulus simulans*, CNPS 4).

**Del Mar Manzanita census, Miramar Marine Corps Air Station, San Diego, CA** Conducted a complete census of the federally endangered Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*) on Miramar Marine Corps Air Station. Survey included mapping and collecting data on all Del Mar Manzanita plants located on military lands. Mr. Brooks located and installed monitoring plots that will be used by military personnel to determine reference conditions and the change in manzanita populations over time. In addition Mr. Brooks wrote the final report detailing all aspects of the work performed.

**Revegetation of coastal sage scrub, Camp Pendleton. CA.** Mr. Brooks drafted a revegetation plan for the United States Marine Corps for the area surrounding a new water treatment facility. This report detailed a five year plan in including implementation, irrigation and weed control. In addition to the design, Mr. Brooks was directly involved in overseeing the implementation of the project.

**Rare plant surveys, Napa-Sonoma transmission line upgrade, CA.** Mr. Brooks assisted with rare plant surveys throughout Napa and Sonoma counties to determine possible routes for additional transmission line corridors while minimizing impacts to special status plant species.

**Rare plant survey, Mallard Slough, CA.** Conducted a rare plant survey for a potential natural gas drilling site on Mallard Island located along Suisan Bay in Contra Costa County California. During the survey two new populations of special status plant species were located, Mason's lilaopsis (*Lilaeopsis masonii* CNPS 1B), and delta mudwort (*Limosella subulata* CNPS 2).

**HISTORY**

2009 to present. Jason Brooks Consulting, Botanist  
2001 to present. Garcia and Associates (GANDA), CA. Botanist.  
2001 to present. Pacific Crest Consulting, Ashland OR. Botanist.  
2000-2001. Blanton and Associates, Austin TX. Botanist.  
1999-2000. University of Arizona, Tucson, AZ. Lab technician.  
1999. United States Geological Survey, Jamestown, ND. Botanist.  
1998-1999. Northern Arizona University, Department of Forestry, AZ. Botanist.  
1997-1998. United States Geological Survey, Fort Collins, CO. Botanist.

**REFERENCES**

\* Available upon request.

**DESERT TORTOISE MONITOR AND BIOLOGIST  
RESPONSIBILITIES AND QUALIFICATIONS**

**DESERT TORTOISE MONITOR** - Approved by the Fish and Wildlife Service to monitor project activities within desert tortoise habitat, ensure proper implementation of protective measures, and record and report desert tortoise and sign observations in accordance with approved protocol, report incidents of non-compliance in accordance with biological opinions or permit, move desert tortoises from harms way when desert tortoises enter project sites and place these animals in “safe areas” pre-selected by Authorized Biologists or maintain the desert tortoises in their immediate possession until an Authorized Biologist assumes care of the animal. Monitors assist Authorized Biologists during surveys and often serve as “apprentices” to acquire experience. Monitors are not authorized to conduct presence/absence or clearance surveys unless directly supervised by an Authorized Biologist; “directly supervised” means the Authorized Biologist is in direct voice and sight contact with the Monitor.

**AUTHORIZED BIOLOGIST** - Approved by the Fish and Wildlife Service to conduct all activities described in the previous section for Desert Tortoise Monitors, and to locate desert tortoises and their sign (i.e., conduct presence/absence and clearance surveys) and ensure that the effects of the project on the desert tortoise and its habitat are minimized in accordance with a biological opinion incidental take permit. Authorized Biologists must keep current with the latest information on U.S. Fish and Wildlife Service protocols and guidelines. An Authorized Biologists must have a thorough and current knowledge of desert tortoise behavior, natural history, and ecology, physiology, and demonstrated substantial field experience and training to safely and successfully:

- handle and temporarily hold desert tortoises
- excavate burrows to locate desert tortoise or eggs
- relocate/translocate desert tortoises
- reconstruct desert tortoise burrows
- unearh and relocate desert tortoise eggs
- locate, identify, and record all forms of desert tortoise sign

**GENERAL DESERT TORTOISE BIOLOGIST/MONITOR QUALIFICATIONS STATEMENT**

This form should be used to provide your qualifications to agency officials if you intend to handle or survey desert tortoises during construction of other projects authorized under Sections 7 or 10 (HCPs) of the Endangered Species Act. If you seek approval to attach/remove/insert any devices or equipment to/into desert tortoises, withdraw blood, or conduct other procedures on desert tortoises, a recovery permit or similar authorization may be required.

Application for a recovery permit requires completion of Form 3-200-55, which can be downloaded at <http://www.fws.gov/forms/3-200-55.pdf>. Supplemental information for the recovery permit application should be provided with the form, *Statement of Skills and Experience with Specialized Desert Tortoise Procedures*, which is available from a U.S. Fish and Wildlife Service Field Office.

**1. Contact Information**

<b>Name</b>	Jason Brooks
<b>Address</b>	2988 Diane Street
<b>City, State, Zip Code</b>	Ashland, Oregon, 97520
<b>Telephone</b>	541-941-5579
<b>Email Address</b>	jasonrbrooks@msn.com

2. **Date of Statement: January 19, 2012**

3. **States in which authorization is requested (check all that apply):**

California     Nevada     Utah     Arizona

4. **Please provide information on the project:**

<b>USFWS BO or HCP Number</b>		<b>Date:</b>
<b>Project Name</b>		
<b>Federal Agency</b>		
<b>Proponent or Contractor</b>		

5. **Specify project and/or activities anticipated that require authorization (e.g., capture/release, weigh, measure, attach and remove telemetry devices and other hardware, etc.). Specifically reference the relevant document and page numbers with authorizing statements (e.g., BO page 19, terms and conditions 6, 7, and 8):**

6. **If you hold, or have held any relevant state or federal wildlife permits, provide the following:**

<b>Species</b>	<b>Dates</b>	<b>State (specify) or Federal Permit Number</b>	<b>Authorized Activities</b>

7. **Education (provide up to three, listing most recent first):**

<b>Institution</b>	<b>Dates Attended</b>	<b>Major/Minor</b>	<b>Degree received</b>
1. Northern AZ University	9/91-5/97	Botany	Bachelor of Science
2.			
3.			

**8. Desert Tortoise Training.**

**(Include numbers of animals handles under the Experience section (No. 9 below)).**

<b>Name/Type of Training</b>	<b>Dates (From/To)</b>	<b>Location</b>	<b>Instructor/Sponsor</b>
1. Desert Tortoise Monitoring and Handling Techniques Workshop	December, 2000	El Centro, CA	John Weir
2.			
3.			
4.			

**9. Experience** – Complete for each position held, attach additional sheets as necessary. Include only those positions relevant to the requested work with desert tortoises. Distinguish between Mojave desert tortoise and other experience. Include only your experience, not information on the project you worked on (e.g., if 100 tortoises were handled on a project and you handled 5 of those tortoises, include only those 5). List most recent experience first.

<b>General Field Experience:</b>		
<b>Project Name &amp; Job Title</b>	<b>Dates (From/To)</b>	<b>Job Duties &amp; Responsibilities/ Skills Used or Acquired</b>
<b>Ivanpah Solar Facility/Botanist</b>	5/2010	Mr. Brooks participated in rare plant re-location surveys in spring 2011 in the eastern Mojave Desert near Primm, CA. During rare plant surveys, Mr. Brooks incidentally encountered two live desert tortoises.
<b>Devers-Palo Verde Transmission Line Reconnaissance Surveys/Biologist</b>	2/2010-3/2010	Conducted reconnaissance-level biological surveys between Blythe and Palm Springs, CA for a proposed transmission line project. Encountered two live desert tortoises and two active desert tortoise burrows with scat and tracks during surveys.
<b>Pacific Gas and Electric Company Trilobite Solar Power Project/Desert Tortoise Surveyor</b>	4/2009 – 5/2009	Mr. Brooks participated in a desert tortoise presence/absence survey at the proposed Trilobite Solar Power Plant site, northeast of Twentynine Palms, California. The purpose was to determine the presence or absence of the desert tortoise by following the guidelines published in the 1992 United States Fish and Wildlife Service (USFWS) Field Survey Protocol for any Federal Action that May Occur within the Range of the Desert Tortoise. The survey area consisted of 7,069 acres; therefore, a total of several hundred survey days and up to 15 surveyors at a time were required to survey the enormous project site. Mr. Brooks spent over 200 hours, during which he surveyed between six to eight miles per day.
<b>Marine Corps Base at Twentynine Palms, CA: Grow the Force -</b>	4/2009 – 5/2009	Mr. Brooks conducted a survey along an approximately 19.5-mile corridor of existing transmission lines between the City of Twentynine Palms and the southern boundary of the Marine Corps Air Ground Combat Center. During this survey, 14 live tortoises

<b>Transmission Line Survey/Desert Tortoise Surveyor</b>		were found in the transmission line zone of influence between April 24 and 29, 2009. In addition to live tortoises, the following tortoise sign was also observed: 49 burrows, 51 scats, 10 carcasses, and numerous tracks.
<b>Marine Corps Base at Twentynine Palms, CA: Grow the Force - Transmission Line Survey/Desert Tortoise Surveyor</b>	4/2008	Mr. Brooks conducted surveys for desert tortoises at the Marine Corps Ground Air Combat Center, Twentynine Palms, CA. The surveys were conducted following USFWS protocols in order to determine presence of the species within the project area. Mr. Brooks encountered five desert tortoises and numerous desert tortoise sign were located during the survey.
<b>Marine Corps Base at Twentynine Palms Survey/Desert Tortoise Surveyor</b>	6/2006	Mr. Brooks conducted surveys for desert tortoises at the Marine Corps Ground Air Combat Center, Twentynine Palms, CA. The surveys were conducted following USFWS protocols in order to determine presence of the species within the project area. Mr. Brooks encountered six desert tortoises and numerous desert tortoise sign were located during the survey.
<b>Topock Compressor Station Project/Desert Tortoise Surveyor</b>	2004-2009	Conducted five seasons of presence/absence surveys for desert tortoise in Topock, California. Encountered three incidences of desert tortoise sign (bone fragments).
<b>U.S. Borax, Desert Tortoise Surveys/Biological Monitor</b>	5/2003-4/2005	Conducted many small desert tortoise surveys for environmental compliance during a proposed mine expansion. During these surveys 3 live tortoises were discovered as well as many incidences of scats and burrows.
<b>Level 3 Fiber Optic Line Desert Tortoise Monitor</b>	11/2000-3/2001	Mr. Brooks provided over 600 hours of desert tortoise monitoring and surveying for level 3 fiber optic line during its construction between Yuma AZ, and San Diego, CA.



<b>Specific Desert Tortoise Field Experience:</b>						
<b>a. Number of hours or 8-hour days (specify) conducting desert tortoise-related activities (referenced above): 1500 hours</b>						
<b>b. Number of miles/kilometers walked conducting survey transects: &gt;450 miles</b>						
<b>c. Number of <u>wild, free-ranging</u> desert tortoises you encountered.</b> <div style="text-align: right;">&lt; 100 mm carapace length: 0</div> <div style="text-align: right;">≥ 100 mm carapace length: 41</div>						
<b>d. Number of <u>wild, free-ranging</u> desert tortoises you personally handled (circle one for each size category).</b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>e. Number of <u>captive</u> desert tortoises you personally handled (circle one for each size category).</b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>f. Number of transmitters or other devices (specify) you personally attached to or removed from <u>wild, free-ranging</u> desert tortoises (circle one for each size category).</b>						
<b><u>Attached:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b><u>Removed:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>g. Number of transmitters or other devices (specify) you personally attached to or removed from <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category).</b>						
<b><u>Specify species or if captive desert tortoises:</u></b>						
<b><u>Attached:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b><u>Removed:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>h. Number of blood samples that you personally collected from <u>wild, free-ranging</u> desert tortoises (circle one for each size category).</b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200

<b>Specific Desert Tortoise Field Experience (continued)</b>						
<b>i. Number of blood samples that you personally collected from <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>j. Experience conducting other procedures on <u>wild, free-ranging</u> desert tortoises (circle one for each size category). <u>Specify type of procedure:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>k. Experience conducting other procedures on <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>l. Prior authorizations for desert tortoise under Biological Opinions or Habitat Conservation Plans (specify number, date, project name and location). <u>Do not reiterate "general field experience" information:</u></b>						

**10. Provide at least 3 references that can verify your field qualifications and skills:**

Name	Employer/Position	Address/Location	Phone Number	Email
1.	Robert Gilman Garcia and Associates/ Biologist/Approved Handler	1 Saunders Ave, San Anselmo, CA 94960	(415) 999- 5706	rgilman@garciaandassociates.com
2.	Jackie Finck Garcia and Associates/ Biologist/Approved Handler	Palm Springs, CA	(415) 310- 2405	jfinck@garciaandassociates or jafinck@yahoo.com
3.	Miriam Lara de Vamstaad/ National Park Service/Biologist/Approved Handler	Twentynine Palms, CA	(760) 808- 5673	mj_lara@hotmail.com

I certify that the information submitted in this form is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. Ch. 46, Sec. 1001.

Signed: Jason Brooks Date: January 30, 2012

# Jeannette Halderman

## PLANT ECOLOGIST/BOTANIST/RESTORATION ECOLOGIST

P.O. Box 1744, Truckee, CA 96160

(530) 550-9260 home office (530) 412-1062 cell

[jtaysmiling@yahoo.com](mailto:jtaysmiling@yahoo.com)

### EXPERTISE

Special-status Plant Surveys  
Revegetation and Restoration of Native Habitat  
Construction Monitoring

### EDUCATION

California State University, Fullerton, BA Biology, with emphasis on Botany, 1988.

California State University, Fullerton, MA Biology with emphasis on Plant Physiology and Plant Ecology, August 1991.

### PROFESSIONAL EXPERIENCE

2012 to present – Program Manager, Part-time, Truckee River Watershed Council, Truckee, California

2012 to present - Plant Ecologist/Botanist, Project Hire, Dudek, Auburn, California

2012 to present - Plant Ecologist/Botanist, Project Hire, Salix Consulting, Auburn, California

2010 – present – Plant Ecologist/Botanist, Sole Proprietor, Truckee, California

2010 - present - Plant Ecologist/Botanist, Project Hire, Garcia & Associates, Inc., Auburn, California

2005 – 2010 - Restoration Ecologist / Botanist, (ECOCON Contractors, Inc. - owner), Truckee, CA

1998 – present - Restoration Ecologist / Botanist, LSA Associates, Inc., Rocklin, California.

1995 – 1998 - Restoration Ecologist, LSA Associates, Inc., Irvine, California.

1991 – 1995 - Restoration Ecology, P&D Consultants, Orange, California.

1989 – 1991 -Plant Pathologist and Soil Technician, Soil and Plant Laboratory, Inc., Orange, CA

### PROFESSIONAL RESPONSIBILITIES

Ms. Halderman is a Plant Ecologist/Botanist/Restoration Ecologist, working as a project hire for several environmental consulting companies and also as a sole proprietor. Ms. Halderman has over 22 years of experience including 2 years as a soil and plant pathologist technician, and 22 years as a restoration ecologist/ botanist.

As a field biologist, Ms. Halderman is experienced at plant community and special-status plant surveys. She has conducted habitat quality analysis (included collecting cover and composition data) and performed sensitive plant surveys and population counts. She has also assisted with jurisdictional delineations and coordinated with resource agencies to acquire regulatory permits.

Ms. Halderman has extensive experience monitoring construction projects throughout Southern California where environmental compliance required avoidance of impacts to nesting birds, special-status wildlife species and plants, and wetlands. Some of the special-status species potentially present on these projects include California gnatcatcher, burrowing owl, numerous special-status plant species, desert tortoise, San Joaquin Kit Fox, Stephen's Kangaroo Rat, Southwestern pond turtle, etc.

As a restoration ecologist, Ms. Halderman has authored numerous revegetation and mitigation plans, and has prepared numerous construction drawings and specifications for native habitat revegetation in northern and southern California, including sage scrub habitats, chaparral, montane meadow, riparian, Jeffrey Pine forest, oak woodland, grasslands, vernal pools, salt marsh, and freshwater marsh habitats. She has extensive experience in coordinating seed and plant material collection and propagation for restoration projects.

The following are some of the representative botanical projects that Ms. Halderman has worked on in Northern and Southern California over the last 22 years.

**Botanical Surveys (Special-interest plant surveys & species identification & mapping) – Southern California**

- Alta Infill Wind Project, Mojave Desert (Kern County) (2010 and 2011)
- Terra-Gen Power Development Company's Wind Project, Mojave Desert (Kern County) (2010, 2011)
- Morgan Hills Wind Project, Mojave Desert (Kern County) (2011)
- SCE Devers Valley Project (San Bernardino County) (2010)
- North Sky River Wind Energy Project, Tehachapi Mountains (Kern County) (2010)
- Tejon Ranch
- Metropolitan Water District Inland Feeder Water Pipeline, San Bernardino/Riverside Counties (1992)
- San Geronio Pass Water Agency Water Project, Riverside County (1993)
- Southern California Gas Pipeline, Riverside County (1993)
- Eastern Transportation Corridor (1993)

**Botanical Surveys (Special-interest plant surveys & species identification & mapping) – Northern California**

- Robert's Road Project, Sonoma County (2012)
- Rendering Plant Project, Sacramento (2012)
- Goose Club Farm Project, Sutter County (2012)
- Sloat Bridge Project, Plumas County (2012)
- Spanish Creek Bridge Project, Plumas County (2012)
- Hirschdale Road Bridges Replacement at Truckee River Project, Truckee (2010, 2011, 2012)
- Canyon Springs Project, Truckee (2011)
- Canyon Springs Project, Truckee (2011)
- Maybert Road Bridge Replacement at Canyon Creek Project, Placer County (2010)
- S-Pod Thinning Project, Northstar - Truckee (2010)
- Proposed Martis Camp Ski Trails Access Project, Truckee (Northstar) (2009)
- Alder Drive/SR-89 Roundabout in Truckee (2008)
- Proposed Alpine Coaster Project, Truckee (Northstar) (2008)
- Northstar/Porcupine Hill Access Alternatives Project, Truckee (2007)
- Lookout Mountain Lift and Trail Expansion Project, Truckee (2007)
- Proposed Forest Heath Treatments at Martis Camp, Truckee (2007)

**Revegetation/Restoration Projects (Designed, implemented and/or monitored construction, maintenance, etc.) – Southern California (Between 1991 - 2005)**

- City of Palmdale – riparian/wetland habitats
- The Irvine Company (Irvine, CA) – numerous coastal sage scrub, chaparral, grassland, and riparian/wetland habitats
- George Air Force Base Landfill Revegetation (Desert tortoise habitat)
- Rancho California Water District – Several riparian, alluvial, and upland habitats
- Metropolitan Water District – Several riparian and upland habitats in Chino Hills State Park
- County of Los Angeles – Numerous culvert revegetation projects
- County Sanitation Districts of Los Angeles County - Puente Hills Landfill Expansion project
- City of Murrieta – Nutmeg Street Expansion Riparian Revegetation project
- Prima Deshecha Landfill – Designed mitigation revegetation project
- Tri-Cities Municipal Water District, Irvine – riparian habitat (Aliso Creek)
- County of Orange – Numerous coastal sage scrub, grassland, chaparral, and riparian habitats (Ex. Newport Coast Drive Extension wetland/riparian mitigation project)
- County of Orange – Bee Canyon Landfill and Irvine Park revegetation project riparian/alluvial habitat

**Nicholas Jensen**  
1040 Sylvan Glen Place  
Auburn, CA 95603  
Phone: (530) 368-7839  
Email: nickjjensen1@gmail.com

### **Education**

- 2003-2005 University of California, Davis, CA  
Completed a Bachelors of Science in Environmental Horticulture and Urban Forestry with an emphasis in Plant Biodiversity and Restoration Ecology, graduated with highest honors.
- 1999-2003 Sierra College Rocklin, CA  
Completed courses toward an AS in Environmental Horticulture
- 1997-1999 Foothill College Los Altos Hills, CA  
Completed course work in Environmental Horticulture and Spanish.

### **Work Experience**

#### **Botanist**

Chicago Botanic Garden  
February 2012-Present  
Contact: Dr Shannon Still

Glencoe, IL  
sstill@chicagobotanic.org

Assisted with planning for field work associated with habitat modeling for 400 rare plants in the Western U.S. Performed analysis using ArcGIS and prepared databases using Microsoft Access to assist with the modeling effort. Prepared plant identification materials and maps for use during field work. Performed surveys for rare plants at study areas in Arizona, California, Nevada, and Utah.

#### **Ecologist (Junior Specialist)**

University of California  
May 2011-December 2011  
Contact: Dr. Josh Viers

Davis, CA  
jhviers@ucdavis.edu

Planned and implemented field surveys in montane meadows in the Sierra Nevada, Cascades, and Modoc Plateau of California. This involved extensive communication with 10 national forests and cooperation with regional forest service employees. Planning involved significant use of ArcGIS software and the Microsoft Office Suite (Access, Excel, and Word). Field work involved ecological and hydrological assessments at each meadow and supervising as many as five employees at a time.

#### **Rare Plant Program Director**

California Native Plant Society  
December 2007-June 2010  
Contact: Jim Andre

Sacramento, CA  
granites@telis.org

As the director of the California Native Plant Society's (CNPS) Rare Plant Program I facilitated the review process for the conservation status for dozens of taxa. This involved conducting

literature reviews and compiling scientific information on plants under review. This process required me to work closely with the California Department of Fish and Game (CDFG) and The California Natural Diversity Database (CNDDDB) while integrating the input of hundreds of professional botanists and interested parties on proposed conservation status changes. Additionally, I performed field surveys of rare plants across the state. I contributed to CNPS' Conservation Program by helping to evaluate the effects of large regional development projects on rare plants and natural communities across the state. I participated as an instructor for CNPS professional workshops on the topics of rare plant science and plant taxonomy. Over the course of my employment I gave numerous presentations on rare plant science and conservation issues at scientific, professional, and public meetings. My employment required me to maintain close professional relationships with professional botanists, scientists and conservationists working in academia, and for state and federal governmental agencies, and interested members of the public. I participated in the planning of the 2009 CNPS Conservation Conference. This included co-chairing the Conference's Rare Plant Session, which included 18 scientific presentations. Following the conference I served as the coordinating editor of the Conference Proceedings, published in 2011. The position required me to be proficient in various computer programs including Microsoft Office (e.g. Access, Excel, and PowerPoint) and ArcMap GIS software. I planned, acquired funding for, and implemented the redesign of the web-based CNPS Online Inventory of Rare and Endangered Plants. I participated in the preparation of successful grant proposals in 2009 and 2010. Additionally, I participated in the hiring process for numerous employees and served as a supervisor for as many as three employees and/or volunteers at a time.

### **Assistant Vegetation Ecologist**

California Native Plant Society  
March 2006-December 2007  
Contact: Julie Evens

Sacramento, CA  
[jevans@cnps.org](mailto:jevans@cnps.org)

I conducted numerous vegetation surveys using CNPS Rapid Assessment and Relevé survey methodology across the state. I managed vegetation data including extensive use of quality control, queries, forms and reporting in MS Access. I gained experience using ArcGIS software and attended Introduction to ArcGIS I course provided by ESRI. I have participated as an instructor in a number of vegetation sampling trainings. I gained extensive experience using taxonomic keys to identify difficult plant taxa. I am proficient at interpreting aerial photography to interpret plant habitats and vegetation ecology. In 2007, I completed a report on the status of Ventura marsh milk-vetch, which included an analysis of the habitat and restoration challenges of this extremely rare plant.

### **Horticulturist**

University of California, Davis Arboretum  
April 2004-June 2005  
Contact: Ryan Deering

Davis, CA  
[rhdeering@ucdavis.edu](mailto:rhdeering@ucdavis.edu)

I gained extensive experience propagating plants for sale at UC Davis Arboretum plant sales. I helped manage over one-acre of nursery container stock. I gained experience organizing and instructing groups of volunteers. Additionally, I maintained irrigation systems and used of integrated pest management to control disease, insect, and weed pests. I also used a database record-keeping system to catalog plants grown at the nursery



## **Botanist**

United States Forest Service, T.E.A.M.S. Enterprise Unit  
2003 (5/03-8/03)  
Contact: Blaze Baker

Porterville, CA

bobaker@fs.fed.us

I conducted surveys for rare plant species on the Plumas and Sequoia National Forests and performed surveys for noxious weeds. I worked extensively with taxonomic keys to compile a comprehensive list of plant species occurring in an area of the Plumas National Forest. I received training and experience using Trimble Geoexplorer GPS equipment to establish plots and record data. I gained significant experience writing reports and completing documents used in the National Environmental Policy Act (NEPA) process.

## **Botanist**

Tahoe National Forest  
2000-2002 (5/00-8/00, 5/01-8/01, 5/02-10/02)

Nevada City, CA

Contacts:

Kathy Van Zuuk

kvanzuuk@fs.fed.us

I conducted field surveys for rare plant species on the Tahoe National Forest (TNF) and performed surveys for noxious weeds. I attended a field identification workshop given by Dr. Dan Norris about the identification of rare mosses and liverworts. During 2001 and 2002 performed extensive for rare species of *Botrychium* (moonworts) and other sensitive wetland species. In 2000 and 2001, I conducted assessment of range allotments in the Sierra Nevada. I used species habitat and distribution information to determine potential for the occurrence of rare plant and weed species in specific project areas. Additionally, I worked on specimen identification and the maintenance of the TNF herbarium.

**Note:** Recent gap in work experience from July 2010 to May 2011 is the result of international travel in Asia and the Pacific.

## **Publications**

J. W. Willoughby, B. K. Orr, K.A. Schierenbeck, and N. J. Jensen [eds.], Proceedings of the CNPS Conservation Conference: Strategies and Solutions, 17–19 Jan 2009, California Native Plant Society, Sacramento, CA

Jensen, Nicholas J. 2007. The habitat of *Astragalus pycnostachyus* var. *lanosissimus* (Ventura marsh milk-vetch) and an assessment of potential future planting sites. Report submitted to David L. Magney, Channel Island Chapter, CNPS.

## **Activities, Achievements, and Volunteer Work**

- Co-chair of the Rare Plant Session of the January 2012 CNPS Conservation Conference
- Member of the steering committee for the 2012 CNPS Conservation Conference
- Auction and raffle co-chair and photography contest judge for the 2009 CNPS Conservation Conference
- President's Honor Roll (over 3.95 GPA) at UC Davis, Fall 2003-Spring 2005

- 2003-2005: member of the UC Davis Botany Club. Served as President (2004-2005)
- Received the American Botanical Society Young Botanist Award (June 2005)
- Received the UC Davis Departmental Citation in Environmental Horticulture (June 2005)
- Received membership in the Phi Beta Kappa National Honor Society (June 2005)
- Honor Roll Status at Sierra College with 3.96 GPA
- Received 2001 Sierra College Outstanding Student Award in Environmental Horticulture.
- Member of the Sierra College Environmentally Concerned Organization of Students 2000-2003. Served as President 2002-2003
- Received Associated Students of Sierra College Student Leadership Award in Fall 2002.
- Professional Associations: California Native Plant Society, Northern California Botanists, Southern California Botanists, California Botanic Society

### **Special Qualifications**

- I possess a valid driver's license and a clean driving record
- Extensive experience in camping and backpacking
- I completed a Wilderness First Aid and CPR course in June 2011
- I am an accomplished photographer with knowledge of digital and film techniques

# **Russell Kokx**

## **Biological Consultant**

PO Box 803 Lone Pine  
CA 93545  
Phone 661 809-4427

**Education** California State University-Fresno,  
B.A. Environmental Biology

### **Additional Studies**

Wetland Delineations:  
(The Wetland Training Institute)  
Identification of Bryophytes:  
Dr. Dan Norris (Humboldt State)  
Identification of Higher Fungi: Dr. Harrold Thiers  
(San Francisco State)

### **Experience Summary**

Mr. Kokx has over 20 years of professional experience in conducting surveys for rare plants, mapping vegetation, and organizing floristic surveys. He has developed and participated in several re-vegetation projects in Kern County and conducted surveys for rare plants in many counties and plant communities throughout California, Nevada and portions of Arizona.

### **Examples of relative Desert and Great basin experience include:**

#### **Clark Biological Consulting (CBC)**

**Hidden Hills Ranch SEGS, CH2M HILL and BrightSource Energy, Mojave Desert, Inyo County.** Participated in fall rare plant surveys and a floristic inventory.

Completed a late-season rare plant survey for a 3,500-acre site, using Intuitive Controlled method. Spring survey is planned for 2011, which will complete fulfillment of survey requirements of BLM, CDFG, USFWS, CNPS, and California Energy Commission (CEC). (2010)

#### **ECORP, Tehachapi Renewable Transmission Line Project (TRTP) Mojave Desert, Los Angeles and Kern Counties**

Conducted vegetation mapping and assisted in rare plant surveys for all listed and sensitive plant species for SCE's proposed transmission lines; Segments 2, 3A and portions of 4, 5, 9, 10 2009 to present.

#### **Clark Biological Consulting**

**Mormon Mesa SEGS, CH2M HILL and BrightSource Energy, Mojave Desert, Clark County, Nevada:** Participated in a 100% transect-based protocol-level rare plant and invasive weed surveys, on a 5,000-acre site. GPS units used to record field data. Project included site visits to known rare plant reference populations with potential to occur on in the project area.

**John Stebbins and Associates, Southern California Edison (SCE) Biology Consultant San Bernardino, Los Angeles, Inyo, and Kern County, (including Death Valley).**

Provide ongoing consulting services to Southern California Edison for their deteriorated pole replacement program, idle facilities, line extensions and operations and maintenance.

Services include rare plant surveys, vegetation monitoring and habitat classifications.

1992-Present

**Clark Biological Consulting, Ivanpah SEGS, CH2M HILL and BrightSource Energy, Mojave Desert, San Bernardino County:** Participated in a protocol-level 100% transect-based rare plant and invasive weed surveys on a 4,500-acre site. Nine rare plant species were recorded onsite: Rusby's desert mallow, Mojave milkweed, desert pincushion, Parish's club-cholla, nine-awned pappus grass, small-flowered androstephium, Utah mortonia, desert portulaca, and Utah vine milkweed. The project satisfied survey requirements of CEC, BLM, USFWS, CDFG and CNPS. Project approved in 2010.

**The Endangered Species Recovery Program**

**Caltrans, Botany Consultant Mojave Desert, Inyo County:** Supervising field botanist.

Organized and directed crews for transect based floristic inventory /rare plant survey. Completed vegetation mapping and collected and labeled voucher specimens for all species.

Recorded and mapped several rare species including; Owen's valley checker bloom, several list 4 species, located and mapped the largest known population of Parish's popcorn flower.

**Mc Cormick Biological Consulting, Kern County** Conducted botanical inventories and rare plant surveys for a proposed wind farm in Northern Antelope valley. Surveyed for rare plants for a proposed wind farm near Jawbone Canyon. Surveyed and mapped rare plants on portions of Tejon ranch for a potential mitigation bank.

**Dr. Alice Karl, Field Biologist, San Bernardino, Imperial, Riverside and Yuma Az.**

Assisted with radio telemetry surveys for Desert Tortoise and conducted vegetation sampling for a proposed low level radioactive deposit site. Western Power phases 1 and 2. Conducted Desert Tortoise surveys in the Colorado Desert, mapped tortoise burrows and sign, surveyed and mapped all listed botanical species. Mapped all listed species populations and vegetation habitats for proposed power upgrades.

**Project Biologist URS/Calpine, Pastoria Energy Facility, Kern County**

Agency-approved designated Biologist for construction of the Pastoria Energy Facility, conducted all biological related surveys including rare plant surveys and a complete floristic inventory of the project site. Wrote the biological assessments and performed the wetland delineations for re-routes of the gas pipeline. Designed native seed mix and re-vegetation plan for habitat reclamation and monitored re-vegetation until reclamations standards were met.

**References:**

**John Stebbins, Botany Consultant  
559-250-3447**

**William Clark, Clark Biological Consulting  
209-617-6456**

*Agave utahensis* var. *nevadensis*  
*Allium atrorubens* var. *atrorubens*  
*Allium atrorubens* var. *cristatum*  
*Amsinkia vernicosa* var. *furcata*  
*Androstephium breviflorum*  
*Arctomecon californica*  
*Arctomecon merriamii*  
*Astragalus cimae* var. *cimae*  
*Astragalus insularis* var. *hartwoodii*  
*Astragalus inyoensis*  
*Astragalus geyeri* var. *triquetrus*  
*Astragalus lentiginosus kernensis*  
*Astragalus mohavensis* var. *hemigyris*  
*Astragalus mohavensis* var. *mohavensis*  
*Astragalus nutans*  
*Astragalus nyensis*  
*Astragalus preussii* var. *laxiflorus*  
*Astragalus preussii* var. *preussii*  
*Atriplex coronata*  
*Atriplex coronata* var. *coronata*  
*Atriplex depressa*  
*Atriplex tularensis*  
*Atriplex vallicola*  
*Bouteloua trifida*  
*Camissonia boothii* ssp. *boothii*  
*Camissonia* ssp. *intermedia*  
*Calochortus clavatus* var. *gracilis*  
*Calochortus clavatus* var. *gracilus*  
*Calochortus excavatus*  
*Calochortus palmeri* var. *palmeri*  
*Calochortus striatus*  
*Calochortus westonii*  
*Camissonia kernensis* var. *kernensis*  
*Carnegiea gigantea*  
*Castela emoryi*  
*Cheilanthes wootonii*  
*Chorizanthe parryi* var. *parryi*  
*Chorizanthe spinosa*  
*Cirsium crassicaule*  
*Cordylanthus tecopensis*  
*Coryphantha alversonii*  
*Coryphantha chlorantha*  
*Coryphantha vivipara* var. *rosea*  
*Cryptantha clokeyi*  
*Cryptantha costata*  
*Cyrtantha holoptera*  
*Cymopterus deserticola*  
*Cymopterus gilmanii*  
*Cymopterus ripleyi* var. *saniculoides*  
*Cynanchum utahense*  
*Deinandra mojavensis*  
*Enceliopsis nudicaulis* ssp. *nudicaulis*  
*Erodium macrophyllum*  
*Eriastrum hooveri*  
*Ericameria albida*  
*Eriogonum bifurcatum*  
*Eriogonum corymbosum* var. *nilesii*  
*Eriogonum gossypinum*  
*Eriogonum viscidulum*  
*Erioneuron pilosum*  
*Eriophyllum mohavense*  
*Eschscholzia lemmonii* ssp. *kernensis*  
*Gilmania luteola*  
*Goodmania luteola*  
*Grusonia parishii*  
*Hackelia sharsmithii*  
*Iva acerosa*  
*Layia leucopappa*  
*Linum puberulum*  
*Lupinus padre-crowleyi*  
*Matalea parvifolia*  
*Menodora scabra*  
*Mentzelia tridentata*  
*Mimulus mohavensis*  
*Mimulus pictus*  
*Mortonia utahensis*  
*Muilla coronata*  
*Nemacladus gracilis*  
*Nitrophila mohavensis*  
*Opuntia basilaris* var. *brachyclada*  
*Opuntia treleasei*  
*Opuntia wigginsii*  
*Oryctes nevadensis*  
*Penstemon albomarginatus*  
*Penstemon arenarius*  
*Penstemon bicolor* ssp. *roseus*  
*Penstemon fruticiformis* var. *amargosae*  
*Penstemon utahensis*  
*Perityle inyoensis*  
*Petalonyx thuberi* ssp. *gilmani*  
*Phacelia inyoensis*  
*Phacelia nashiana*  
*Phacelia parishii*  
*Phacelia pulchella* var. *gooddingii*  
*Pinus longaeva*  
*Plagiobothrys parishii*  
*Psoralea arborescens* var. *arborescens*  
*Stylocline citroleum*  
*Stylocline masonii*  
*Sclerocactus johnsonii*  
*Sclerocactus polyancistris*  
*Selaginella leucobryoides*  
*Sidalcea covillei*  
*Sphaeralcea rusbyi* ssp. *eremicola*  
*Wislizenia refracta* ssp. *refracta*

## DESERT TORTOISE AUTHORIZED BIOLOGIST REQUEST FORM

This form should be used to provide your qualifications to agency officials if you wish to undertake the duties of an authorized biologist with regard to desert tortoises during construction or other projects authorized under Sections 7 (Biological Opinions) or 10(a)(1)(B) (i.e., Habitat Conservation Plans) of the Endangered Species Act.

(If you seek approval to attach/remove/insert any devices or equipment to/into desert tortoises, withdraw blood, or conduct other procedures on desert tortoises, a recovery permit or similar authorization may be required. Application for a recovery permit requires completion of Form 3-200-55, which can be downloaded at <http://www.fws.gov/forms/3-200-55.pdf>.)

### 1. Contact Information:

<b>Name</b>	Russell Kokx
<b>Address</b>	PO Box 803
<b>City, State, Zip Code</b>	Lone Pine CA 93545
<b>Phone Number(s)</b>	661-809-4427
<b>Email Address</b>	kokxbio@gmail.com

2. Date: 9/24/12

### 3. Areas in which authorization is requested (check all that apply):

San Bernardino, Kern, Inyo and Los Angeles Counties, California (Ventura office)  
 Riverside, San Diego, and Imperial Counties, California (Carlsbad office)  
 Nevada     Utah     Arizona

### 4. Please provide information on the project:

<b>USFWS Biological Opinion or HCP No. When Applicable</b>	84320-2010-F-0448	<b>Date:</b>	June 1, 2011 to December 2014
<b>Project Name</b>	Eldorado-Ivanpah Transmission Project (EITP)		
<b>Federal Agency</b>	BLM		
<b>Proponent or Contractor</b>	Southern California Edison (SCE)		



5. If you hold, or have held, any relevant state or federal wildlife permits provide the following:

Species	Dates	State (specify) or Federal Permit Number	Authorized Activities

6. Education: Provide up to three schools, listing most recent first:

Institution	Dates attended	Major/Minor	Degree received
CSU Fresno	1987-1992	Environmental Biology	BA Environmental Biology
Fresno City Collage	1984-1987		

7. Desert Tortoise Training:

Name/Type of Training	Dates (From/To)	Location	Instructor/Sponsor
1. Classes Desert tortoise work shop	Oct. 2007	Ridgecrest CA.	Dr. Alice Karl/Pete Woodman
2. Field training Sign identification and surveying	April 1991	California City	Alice Karl
3. Translocation TransmitterTortoises for translocation study	Sept. 1992	Ward Valley	Alice Karl
4.			

8. Experience – Include only those positions relevant to the requested work with desert tortoises. Distinguish between wild Mojave desert tortoise and other experience. Include only your experience, not information for the project you worked on (e.g., if 100 tortoises were handled on a project and you handled 5 of those tortoises, include only those 5. List most recent experience first. Handling a Mojave desert tortoise must be authorized by a Biological Opinion or other permit and reported to the USFWS. Information proved in this section will be used by the USFWS to track the numbers of tortoises affected by previous projects (baseline). **Be sure to include a project supervisor or other contact that can verify your skills and experience in relation to your job performance.** Attach additional sheets as necessary.

**Experience by project and activity:**

Project Name, Job Title, Dates	Project Contact name, phone no., & Email address	Conduct Clearance Surveys (Hrs/Days)	Excavate DT burrows (No.)	Locate DT No. < 100mm ≥ 100mm	Handled for Relocation DTs (No.)	Excavate, and relocate DT nests (No.)
1. <b>Wildlands Mitigation banking Biologist</b> March and May 2012	Corvus Brooks Hart 858-922-3264 brooks@corvus ecological.com	180 hrs/18 days		1 14		
2. Desert Sunlight Biologist 2011-2012	Chris Blandford Chris@ironwood-inc.com	200hrs/30 days		3		
<b>3TRTP Biological Monitor/surveys</b> March 2009 to present	David Carr 714-376-4357	350/60		1		
<b>4John Stebbins and Associates SCE deteriorated pole program Biologist</b> 1991-present	John Stebbins 559-250-3447 jstebb@cVIP.net	1,050/150		5 17		
<b>5.Fort Irwin Expansion Kivo Biological Consulting Biologist</b> April 2007	Pete Woodman 760-861-3961 kivobio@aol.com	220.5/21		4 16	5	
<b>6.Cima mine expansion 19 Ecology and Environment Biologist</b> October 1995	Dr. John Good	77/7		0 2		
7.Ward Valley Biologist 1993	Dr Alice Karl	615/60		5 20	8	
<b>8.Western Power phases 1 and 2 Biologist</b> 1993-1994	Woodward Clyde	320/30		0 5		

9.						
10.						

**Experience by project and activity (continued):** Each project number should correspond with the project listed on the previous page

Project Number (Corresponds to previous page)	Construct Artificial Burrows (No.)	Monitor project equipment and activities (Hrs/Days)	Oversee project compliance (Hrs/Days)	Supervise DT field staff (Hrs/Days) and No. staff supervised	DT fence Installation and Inspection (Hrs/Days)	Present DT Awareness Training (No.)
1.		120/10	400/40		350/35	10
2.		200/25				8
3.						
4.						
5.						
6.						
7.						

8.						
9.						
10.						

**Summary of experience:**

Total time spent for all desert tortoise-related field activities (referenced above):

Specify total number of hours:  
 OR Total number of 8-hour days:

Total number of miles/kilometers walked conducting survey transects:

Total number of wild, free-ranging desert tortoises you personally handled:

<100 mm:

≥100 mm:

Additional supervisory experience other than with desert tortoise work:

Project	Hours	Staff (No.)
La Paloma Designated Biologist	8,000	16
Calpine Project Biologist	6,000	8

I certify that the information submitted in this form is complete and accurate to the best of my knowledge and belief.

I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. Ch.47, Sec. 1001.

**CHLOE B. SCOTT**  
**Biologist**

2988 Diane Street, Ashland, Oregon 97520  
email: chloebScott2@gmail.com  
cell: 415.717.7785

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**PROFESSIONAL PROFILE**

Chloe Scott is a biologist with over nine years of experience working as a biological consultant in California, Nevada, Arizona, and Oregon. She has conducted biological investigations in a variety of habitats including Mojave desert scrub, Joshua tree woodland, oak woodlands, valley grasslands, wetlands, vernal pools, coastal scrub, coniferous forests, and rivers and creeks throughout California. Her experience includes conducting field surveys ranging from reconnaissance-level investigations to special-status species surveys following U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, and California Department of Fish and Game protocols; performing population studies; conducting habitat evaluations; and mapping vegetation communities and wetlands. Ms. Scott is knowledgeable in plant and wildlife taxonomy and identification, field methods and observation skills, and vegetation community types. She has completed or contributed to numerous environmental documents including Biological Assessments/Evaluations, Environmental Assessments, biological data reports, vegetation management plans, protocol-survey reports, and other technical reports and studies. Ms. Scott has field survey experience with a number of special-status species including rare plants, desert tortoise, burrowing owl, California spotted owl, California tiger salamander, California red-legged frog, foothill yellow-legged frog, Sierra Nevada yellow-legged frog, western pond turtle, northern goshawk, and nesting migratory birds.

**EDUCATION**

B.A., Environmental Studies (emphasis in Natural History), University of California Santa Cruz, 2002

**EMPLOYMENT HISTORY**

2002-present	Biologist	Garcia and Associates, San Anselmo, CA
2001	Grader	University of California, Santa Cruz: Natural History of Marine Mammals and Birds

**SELECT RECENT PROJECT EXPERIENCE**

**Rare Plant Surveys, Pahrump Valley and Surrounding Areas, Inyo County, CA and Clark and Nye Counties, NV (Fall 2010 and Spring 2011 and 2012).** Ms. Scott participated in late-season and spring rare plant surveys in fall 2010, spring 2011 and spring 2012 in the eastern Mojave Desert. The rare plant surveys were conducted for the 3,500-acre site using intuitive controlled method and using GPS units to record field data. The spring surveys also included linear survey of the proposed transmission line routes for the project.

**Rare Plant Surveys, Southern Sierra Nevada Mountains (2012).** Ms. Scott conducted botanical surveys in July 2012 for a proposed wind energy generation project in the southern Sierra Nevada

mountains in Kern County, California. The purpose of the botanical surveys was to locate and map occurrences of special-status plant species within the proposed project area.

**Rare Plant Surveys, Tehachapi Mountains (2010 and 2011).** Ms. Scott conducted botanical surveys in May, June and July, 2010 and June 2011 for the 6,150-acre project located in the foothills of the Tehachapi Mountains and the southern Sierra Nevada abutting the western edge of the Mojave Desert in Kern County, California. The purpose of the botanical surveys was to locate and map occurrences of special-status plant species and invasive weeds occurring within the proposed project area.

**Rock Creek-Cresta Foothill Yellow-legged Frog Population Study (2008-2012).** Ms. Scott participated in an on-going study of foothill yellow-legged frog populations on the Rock Creek and Cresta reaches of the North Fork Feather River. This project is part of PG&E's North Fork Feather River FERC licensing agreement.

**Rare Plant Surveys and Mapping, Mojave, CA (2010 - 2011).** Ms. Scott conducted floristically-based rare plant surveys in June 2010 and 2011 for three large-scale wind power project near the towns of Mojave and Tehachapi, CA.

**Rock Creek-Cresta and North Fork Mokelumne River Noxious Weed Monitoring (2011).** Ms. Scott conducted noxious weed mapping and treatment monitoring in July and August 2011 within portions of the North Fork Feather River watershed in Plumas and Butte counties and the North Fork Mokelumne River watershed in Amador, Alpine and Calaveras counties. Ms. Scott prepared the 2011 annual noxious weed monitoring reports for these projects.

**Path 15 Biological Services (2011).** Ms. Scott lead the biological resources portion of the Path 15 Transmission Line Operations and Maintenance project located in the western San Joaquin Valley, CA. Responsibilities included conducting habitat-typing and reconnaissance-level biological surveys along the of transmission line right-of-way and access roads for sensitive biological resources including wetlands, vernal pools, and sensitive wildlife and plant species and habitats. Ms. Scott was the lead biological contributor to the Operations and Maintenance biological database developed using the data gathered during surveys and background research to advise decision-making on the ground.

**San Joaquin Valley and Sacramento Valley Biological Services (2008-2011).** Ms. Scott lead the biological resources portion of two project located in the San Joaquin and Sacramento valleys, CA. Responsibilities included conducting habitat-typing and reconnaissance-level biological surveys along over 250 miles of transmission line right-of-way and access roads for sensitive biological resources including wetlands, vernal pools, and sensitive wildlife and plant species and habitats. Ms. Scott wrote the biological data report and the biological resources chapter of the Environmental Assessment associated with portions of the project and assisted with coordination of informal Section 7 consultation with USFWS and NOAA Fisheries for the project. Ms. Scott was the lead biological contributor to the Operations and Maintenance biological database developed using the data gathered during surveys and background research to advise decision-making on the ground.

**Lake Aloha Trout Removal and Sierra Nevada Yellow-legged Frog Surveys (2007 and 2010).**



Ms. Scott conducted trout removal and protocol surveys for Sierra Nevada yellow-legged frogs in the ponds below El Dorado Irrigation District's auxiliary dams at Lake Aloha in July 2007 and again in August 2010. Trout removal was conducted using gill nets, electrofishing and snorkeling. The purpose of the survey was to remove trout from the ponds below the dams in order to keep trout out of the Sierra Nevada yellow-legged frog habitat. Twenty-four ponds were surveyed and adult, juvenile, and larvae (over-winter tadpoles) Sierra Nevada yellow-legged frogs were observed during surveys.

**River Bluffs Solar Park Desert Tortoise Survey (2010).** Ms. Scott conducted a pre-construction presence/absence field survey for desert tortoise at the 1,500 acre River Bluffs Solar Park site near Barstow, California in San Bernardino County. GANDA was subcontractor to CH2M HILL on this project. The survey followed USFWS 2009 protocol for desert tortoise surveys.

**Ivanpah Solar Energy Project Rare Plant Relocation and Demarcation (2010).** Ms. Scott assisted with relocating previously identified rare plant locations for BrightSource's large-scale solar development project in the Mojave Desert, San Bernardino, CA. GANDA was subcontracted to CH2M HILL on this project. Rare plant locations had been recorded on GPS units during subsequent years of botanical surveys. Relocated rare plants were re-mapped using Trimble GeoXT GPS units, data on the individuals or population was updated, and the locations were flagged and staked for avoidance or translocation in preparation for construction.

**U.S. Border Patrol Microwave Tower Biological Evaluations (2010).** Under subcontract to AECOM, Ms. Scott conducted field visits and provided evaluations for biological impacts, including impacts to special-status species, for microwave tower construction or enhancements at 12 sites, mostly located in semi-remote areas of mountain ranges throughout central and eastern southern Arizona.

**Southern California Edison Devers-Palo Verde Transmission Line Siting Surveys (2010).** Ms. Scott conducted biological surveys for siting of a proposed transmission line between Indio and Blythe in Riverside County, California. Ms. Scott surveyed the areas along the line proposed for construction, including all tower locations. Ms. Scott evaluated the locations for impacts to special-status wildlife, plants, and vegetation communities, as well as impacts to potential wetlands or Waters of the U.S.

**Broadwell Lake Rare Plant Survey (2009).** Ms. Scott participated in a large-scale floristically-based rare plant survey for a proposed solar power plant in the Mojave Desert near Barstow, CA. Several new populations of rare plants were found during these surveys.

**Mormon Mesa Rare Plant Survey (2008).** Ms. Scott assisted with a large-scale floristically-based rare plant survey in the northeastern Mojave Desert near Mesquite, NV.

**GTF Desert Tortoise Surveys (2008 and 2009).** Ms. Scott participated in a spring 2009 presence/absence survey for desert tortoise along an approximately 20-mile corridor of existing transmission line outside the Marine Corps Air Ground Combat Center, Twentynine Palms, CA. Ms. Scott also conducted an earlier survey in spring 2008 related to this project, which covered the portions of the project located within the base. As a result of this survey, GANDA surveyors were



successful in locating five live tortoises within the base boundaries, and 14 live tortoises along the transmission line corridor. Numerous signs of tortoises were also recorded, such as scat, bones, shells, burrows, and tracks. A report was submitted to the Navy that included the methods, results, photos, illustrative figures, and original data forms. This work was conducted in support of an Environmental Assessment (EA) for a permanent training facility at the Marine Corps base.

**Trilobite Desert Tortoise Survey (2009).** Ms. Scott conducted a protocol-level presence/absence survey for desert tortoise at a proposed solar power plant site, northeast of Twentynine Palms, California for Pacific Gas and Electric Company. The purpose was to determine the presence or absence of the federally and state-threatened desert tortoise in the 7,069 acres survey area.

**Twentynine Palms Desert Tortoise Presence/Absence Surveys (2008).** Ms. Scott conducted surveys for desert tortoises at the Marine Corps Ground Air Combat Center, Twentynine Palms, CA. The surveys were conducted following USFWS protocols in order to determine presence of the species within the project area. Five desert tortoises and numerous desert tortoise signs were located during the survey.

**Olema Transmission Line California Red-legged Frog Surveys (2008).** Ms. Scott conducted daytime and nighttime preconstruction surveys for California red-legged frogs on the Point Reyes peninsula within designated critical habitat for this species. Numerous observations of California red-legged frogs were made during both daytime and nighttime survey visits. Adults, metamorphs and tadpoles were observed.

**Barren Ridge California Spotted Owl Surveys (2008).** Ms. Scott conducted California spotted owl protocol surveys in the Angeles National Forest along several project alternative routes.

**Barren Ridge California Red-legged Frog Surveys (2008).** Ms. Scott conducted California red-legged frog protocol surveys in the Angeles National Forest along several project alternative routes; included daytime and nighttime survey visits.

**U.S. Borax Burrowing Owl Surveys (2008).** Ms. Scott conducted burrowing owl surveys on 2,000 acres in the Mojave Desert on U.S. Borax property, Boron, CA. Three burrows with burrowing owl sign were identified during the survey and were investigated for owl presence using a fiber optic scope. Desert tortoise sign was also recorded during the survey.

**Topock Compressor Station Desert Tortoise Presence/Absence Surveys (2006-2009).** Ms. Scott has conducted four seasons of extensive surveys for desert tortoises in Topock, CA for Pacific Gas and Electric Company's Topock Compressor Station Project. The surveys were conducted following USFWS protocols in order to determine presence of the species within the project area.

#### **RELEVANT PERMITS, CERTIFICATIONS, TRAININGS, AND MEMBERSHIPS**

- California Scientific Collecting Permit (SC Identification Number 8687)
- Introduction to Lichens Workshop, Siskiyou Field Institute, Selma, OR, October 2010.
- Southwestern Willow Flycatcher Survey Training Workshop, Southern Sierra Research Station, Weldon, CA, May 2008.
- 24-hour Mine Safety and Health Administration (MSHA), January 2008

- Desert Tortoise Council Surveying, Monitoring and Handling Techniques Workshop, Ridgecrest, CA, October 2005.
- Member of the California Botanical Society and the California Native Plant Society

**DESERT TORTOISE MONITOR AND BIOLOGIST  
RESPONSIBILITIES AND QUALIFICATIONS**

**DESERT TORTOISE MONITOR** - Approved by the Fish and Wildlife Service to monitor project activities within desert tortoise habitat, ensure proper implementation of protective measures, and record and report desert tortoise and sign observations in accordance with approved protocol, report incidents of non-compliance in accordance with biological opinions or permit, move desert tortoises from harms way when desert tortoises enter project sites and place these animals in “safe areas” pre-selected by Authorized Biologists or maintain the desert tortoises in their immediate possession until an Authorized Biologist assumes care of the animal. Monitors assist Authorized Biologists during surveys and often serve as “apprentices” to acquire experience. Monitors are not authorized to conduct presence/absence or clearance surveys unless directly supervised by an Authorized Biologist; “directly supervised” means the Authorized Biologist is in direct voice and sight contact with the Monitor.

**AUTHORIZED BIOLOGIST** - Approved by the Fish and Wildlife Service to conduct all activities described in the previous section for Desert Tortoise Monitors, and to locate desert tortoises and their sign (i.e., conduct presence/absence and clearance surveys) and ensure that the effects of the project on the desert tortoise and its habitat are minimized in accordance with a biological opinion incidental take permit. Authorized Biologists must keep current with the latest information on U.S. Fish and Wildlife Service protocols and guidelines. An Authorized Biologists must have a thorough and current knowledge of desert tortoise behavior, natural history, and ecology, physiology, and demonstrated substantial field experience and training to safely and successfully:

- handle and temporarily hold desert tortoises
- excavate burrows to locate desert tortoise or eggs
- relocate/translocate desert tortoises
- reconstruct desert tortoise burrows
- unearh and relocate desert tortoise eggs
- locate, identify, and record all forms of desert tortoise sign

**GENERAL DESERT TORTOISE BIOLOGIST/MONITOR QUALIFICATIONS STATEMENT**

This form should be used to provide your qualifications to agency officials if you intend to handle or survey desert tortoises during construction of other projects authorized under Sections 7 or 10 (HCPs) of the Endangered Species Act. If you seek approval to attach/remove/insert any devices or equipment to/into desert tortoises, withdraw blood, or conduct other procedures on desert tortoises, a recovery permit or similar authorization may be required.

Application for a recovery permit requires completion of Form 3-200-55, which can be downloaded at <http://www.fws.gov/forms/3-200-55.pdf>. Supplemental information for the recovery permit application should be provided with the form, *Statement of Skills and Experience with Specialized Desert Tortoise Procedures*, which is available from a U.S. Fish and Wildlife Service Field Office.

**1. Contact Information**

<b>Name</b>	Chloe Scott
<b>Address</b>	2988 Diane Street
<b>City, State, Zip Code</b>	Ashland, Oregon, 97520
<b>Phone Number(s)</b>	415-717-7785
<b>Email Address</b>	chloebcscott2@gmail.com

2. **Date of Statement: January 19, 2012**

3. **States in which authorization is requested (check all that apply):**

California     Nevada     Utah     Arizona

4. **Please provide information on the project:**

<b>USFWS BO or HCP Number</b>		<b>Date:</b>
<b>Project Name</b>		
<b>Federal Agency</b>		
<b>Proponent or Contractor</b>		

5. **Specify project and/or activities anticipated that require authorization (e.g., capture/release, weigh, measure, attach and remove telemetry devices and other hardware, etc.). Specifically reference the relevant document and page numbers with authorizing statements (e.g., BO page 19, terms and conditions 6, 7, and 8):**

6. **If you hold, or have held any relevant state or federal wildlife permits, provide the following:**

<b>Species</b>	<b>Dates</b>	<b>State (specify) or Federal Permit Number</b>	<b>Authorized Activities</b>

7. **Education (provide up to three, listing most recent first):**

<b>Institution</b>	<b>Dates Attended</b>	<b>Major/Minor</b>	<b>Degree received</b>
<b>1. University of California Santa Cruz</b>	10/1998-6/2002	Environmental Studies	B.A.
<b>2.</b>			
<b>3.</b>			

**8. Desert Tortoise Training.**

**(Include numbers of animals handles under the Experience section (No. 9 below)).**

<b>Name/Type of Training</b>	<b>Dates (From/To)</b>	<b>Location</b>	<b>Instructor/Sponsor</b>
1. Desert Tortoise Annual Surveying, Monitoring and Handling Techniques Workshop	October 22 & 23, 2005	Ridgecrest, CA	The Desert Tortoise Council
2.			
3.			
4.			

**9. Experience** – Complete for each position held, attach additional sheets as necessary. Include only those positions relevant to the requested work with desert tortoises. Distinguish between Mojave desert tortoise and other experience. Include only your experience, not information on the project you worked on (e.g., if 100 tortoises were handled on a project and you handled 5 of those tortoises, include only those 5). List most recent experience first.

<b>General Field Experience:</b>		
<b>Project Name &amp; Job Title</b>	<b>Dates (From/To)</b>	<b>Job Duties &amp; Responsibilities/ Skills Used or Acquired</b>
<b>Hidden Hills Solar Facility/Botanist</b>	3/2011-5/2011	Ms. Scott participated in spring rare plant surveys spring 2011 in the eastern Mojave Desert, Inyo County, CA. During rare plant surveys, Ms. Scott incidentally encountered three live desert tortoises.
<b>Ivanpah Solar Facility/Botanist</b>	5/2010	Ms. Scott participated in rare plant re-location surveys in spring 2011 in the eastern Mojave Desert near Primm, CA. During rare plant surveys, Ms. Scott incidentally encountered two live desert tortoises.
<b>River Bluffs Solar Facility/Desert Tortoise Surveyor</b>	4/2010	Ms. Scott conducted protocol-level desert tortoise surveys for a proposed solar facility near Barstow, California. Ms. Scott found one potential desert tortoise burrow during surveys. No tortoise were encountered.
<b>Devers-Palo Verde Transmission Line Reconnaissance Surveys/Biologist</b>	2/2010-3/2010	Conducted reconnaissance-level biological surveys between Blythe and Palm Springs, CA for a proposed transmission line project. Encountered two live desert tortoises and two active desert tortoise burrows with scat and tracks during surveys.
<b>Pacific Gas and Electric Company Trilobite Solar Power Project/Desert Tortoise Surveyor</b>	4/2009 – 5/2009	Ms. Scott participated in a desert tortoise presence/absence survey at the proposed Trilobite Solar Power Plant site, northeast of Twentynine Palms, California. The purpose was to determine the presence or absence of the desert tortoise by following the guidelines published in the 1992 United States Fish and Wildlife Service (USFWS) Field Survey Protocol for any Federal Action that May Occur within the Range of the Desert Tortoise. The survey

		area consisted of 7,069 acres; therefore, a total of several hundred survey days and up to 15 surveyors at a time were required to survey the enormous project site. Although the project site was located in unusually dry and poor habitat conditions, Ms. Scott found disarticulated plastron bones of one desert tortoise in an area where this species had not been previously been documented. Ms. Scott spent over 200 hours, during which she surveyed between six to eight miles per day.
<b>Marine Corps Base at Twentynine Palms, CA: Grow the Force - Transmission Line Survey/Desert Tortoise Surveyor</b>	4/2009 – 5/2009	Ms. Scott conducted a survey along an approximately 19.5-mile corridor of existing transmission lines between the City of Twentynine Palms and the southern boundary of the Marine Corps Air Ground Combat Center. During this survey, 14 live tortoises were found in the transmission line zone of influence between April 24 and 29, 2009. In addition to live tortoises, the following tortoise sign was also observed: 49 burrows, 51 scats, 10 carcasses, and numerous tracks. Ms. Scott personally found one of the 14 live tortoises and numerous sources of sign.
<b>Broadwell Lake Rare Plant Survey/Botanist</b>	3/2009-4/2009	Ms. Scott conducted a large-scale floristically-based rare plant survey for a proposed solar power plant in the Mojave Desert near Barstow, CA. Several new populations of rare plants were found during these surveys. Ms. Scott incidentally encountered five desert tortoise during these surveys and numerous active burrows and other tortoise sign.
<b>U.S. Borax Desert Tortoise Clearance Survey/Desert Tortoise Surveyor</b>	5/2008	Ms. Scott conducted a desert tortoise protocol survey at the U.S. Borax mine in Boron, California. Ms. Scott encountered one live tortoise and several desert tortoise burrows during the survey.
<b>Marine Corps Base at Twentynine Palms, CA: Grow the Force - Transmission Line Survey/Desert Tortoise Surveyor</b>	4/2008	Ms. Scott conducted surveys for desert tortoises at the Marine Corps Ground Air Combat Center, Twentynine Palms, CA. The surveys were conducted following USFWS protocols in order to determine presence of the species within the project area. Ms. Scott encountered five desert tortoises and numerous desert tortoise sign were located during the survey.
<b>Topock Compressor Station Project/Desert Tortoise Surveyor</b>	2005-2009	Conducted four seasons of presence/absence surveys for desert tortoise in Topock, California. Encountered three incidences of desert tortoise sign (bone fragments).
<b>U.S. Borax, Desert Tortoise Surveys/Biological Monitor</b>	1/2008-2/2008	Conducted over 100 hours of monitoring of various construction sites for the presence of desert tortoise on Borax mining property. No tortoise were encountered.
<b>CAMOUT Facility Project/Desert Tortoise Monitor</b>	2/2006	Monitor installation of desert tortoise exclusion fence on the Marine Corps Air Ground Combat Center in Twentynine Palms, CA. Monitoring took place in February and no tortoise were observed.
<b>Kern Gas Pipeline Installation Project/Desert Tortoise Monitor trainee</b>	12/2003	Conducted 150 hours of pre-construction clearance surveys and construction monitoring for Mojave desert tortoise in the Mojave Desert outside of Barstow, California. Received on-the-job training in the identification of desert tortoises, assessing the age of desert tortoises and assessing desert tortoise burrows for activity. Encountered three desert tortoises and eight active burrows, and a variety of tortoise sign (scat, bone fragments, carapaces).

<b>Specific Desert Tortoise Field Experience:</b>						
<b>a. Number of hours or 8-hour days (specify) conducting desert tortoise-related activities (referenced above): 100</b>						
<b>b. Number of miles/kilometers walked conducting survey transects: &gt;450 miles</b>						
<b>c. Number of <u>wild, free-ranging</u> desert tortoises you encountered.</b> <div style="text-align: right;">&lt; 100 mm carapace length: 0</div> <div style="text-align: right;">≥ 100 mm carapace length: 31</div>						
<b>d. Number of <u>wild, free-ranging</u> desert tortoises you personally handled (circle one for each size category).</b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>e. Number of <u>captive</u> desert tortoises you personally handled (circle one for each size category).</b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>f. Number of transmitters or other devices (specify) you personally attached to or removed from <u>wild, free-ranging</u> desert tortoises (circle one for each size category).</b>						
<b><u>Attached:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b><u>Removed:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>g. Number of transmitters or other devices (specify) you personally attached to or removed from <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category).</b>						
<b><u>Specify species or if captive desert tortoises:</u></b>						
<b><u>Attached:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b><u>Removed:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>h. Number of blood samples that you personally collected from <u>wild, free-ranging</u> desert tortoises (circle one for each size category).</b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200



<b>Specific Desert Tortoise Field Experience (continued)</b>						
<b>i. Number of blood samples that you personally collected from <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>j. Experience conducting other procedures on <u>wild, free-ranging</u> desert tortoises (circle one for each size category). <u>Specify type of procedure:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>k. Experience conducting other procedures on <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></b>						
< 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
≥ 100 mm:	<input type="text" value="Zero"/>	< 10	10-50	50-100	100-200	> 200
<b>l. Prior authorizations for desert tortoise under Biological Opinions or Habitat Conservation Plans (specify number, date, project name and location). <u>Do not reiterate "general field experience" information:</u></b>						

**10. Provide at least 3 references that can verify your field qualifications and skills:**

Name	Employer/Position	Address/Location	Phone Number	Email
1.	Robert Gilman Garcia and Associates/ Biologist/Approved Handler	1 Saunders Ave, San Anselmo, CA 94960	(415) 999- 5706	rgilman@garciaandassociates.com
2.	Jackie Finck Garcia and Associates/ Biologist/Approved Handler	Palm Springs, CA	(415) 310- 2405	jfinck@garciaandassociates or jafinck@yahoo.com
3.	Miriam Lara de Vamstaad/ National Park Service/Biologist/Approved Handler	Twentynine Palms, CA	(760) 808- 5673	mj_lara@hotmail.com

I certify that the information submitted in this form is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. Ch. 46, Sec. 1001.

Signed:  Date: January 30, 2012

## **Appendix F**

### **Soda Mountain Solar Project Summary of Incidental Wildlife Observations**

**Prepared for:**

**Panorama Environmental Inc.  
One Embarcadero Center, #740  
San Francisco, CA 94111**

**Prepared by:**

**C.S. Ecological Surveys and Assessments  
11331 Star Pine Road  
Truckee, CA 96161**

**November 2012**

## INTRODUCTION

This letter report summarizes the incidental wildlife observations made during the fall botanical survey for the proposed Soda Mountain Solar Project (Project) in northeastern San Bernardino County, California. The protocol-level botanical survey for special-status plants was conducted within the project area in October and November 2012 by C.S. Ecological Surveys and Assessments.

Wildlife observations were recorded during the botanical survey and are summarized in this report. Detailed descriptions of the proposed project and the environmental setting can be found in botanical survey report (CESA 2012).

## METHODS

The survey consisted of walking linear transects spaced ten meters apart in an east-west orientation. Methods used to complete the botanical survey were in compliance with the recommended protocols for botanical surveys and are described in the botanical survey report (CESA 2012). These methods differ from protocols used in wildlife surveys and this survey does not take the place of a protocol-level wildlife survey.

The survey team consisted of seven botanists and biologists who are experienced in surveying for special-status plant species within the Mojave Desert bioregion. Russell Kokx, Jason Brooks, and Chloe Scott also have experience with wildlife species inhabiting the Mojave Desert and have conducted protocol-level surveys for desert tortoises and/or burrowing owls. The team systematically surveyed the entire Project area (Attachment 1).

Wildlife species observed incidentally during the botanical survey were recorded in field notes. Special-status wildlife localities were mapped as points using Trimble® GeoXH Global Positioning System (GPS) units. GPS units were equipped with background files for navigation and data dictionaries for data collection. Point data for special-status species were recorded using a project-specific data dictionary that included point features for recording the location of sign or sightings of desert kit fox, burrowing owl, and desert tortoise.

## RESULTS

Five special-status wildlife species were detected within the Project area during the botanical surveys conducted in late October and early November, 2012. Table 1 below summarizes the special-status wildlife observations. A map of the findings is included as Attachment 1 to this report. A list of all wildlife species observed within the Project area during the botanical survey is included as Attachment 2 to this report. Special-status wildlife species and sign of these species observed within the Project area during the botanical surveys are described in further detail below.

- **Desert tortoise (*Gopherus agassizii*)**

Desert tortoise sign, including a tortoise carcass, possible burrows, and a scat, were found in the Project area (Table 1 and Attachment 1). In general, the habitat within the Project area appeared to be insufficient to support a high-density population of desert tortoise. Very little sign of tortoise habitation coupled with low shrub diversity and relatively high human disturbance (OHV use in the area and the presence of the Interstate) indicate that the Project area is likely of low quality for this species.

One desert tortoise carcass was located and mapped on desert pavement within the Project area north of Interstate 15 (I-15) during the survey. The carcass showed wear that indicates it was greater than two years old (i.e., scutes falling from the bone); a photo of the carcass is included in Attachment 3. Three potential desert tortoise burrows were also mapped in the Project area; two in fair to good condition and one partially collapsed. In addition, one recent tortoise scat (i.e., dark brown with glaze) was mapped.

The desert tortoise is state and federally listed as Threatened (CDFG 2012). The desert tortoise has a Global Conservation Status Rank of G4, meaning that the species is "uncommon but not rare" globally with "some cause for long-term concern due to declines or other factors" (NatureServe 2009). Its State Rank is S2, which means the species is considered "critically imperiled" in California, and is further defined as being "at very high risk of extinction or elimination due to extreme rarity, very steep declines, or other factors" (NatureServe 2009).

#### **Burrowing owl (*Athene cunicularia*)**

Burrowing owls and burrowing owl sign including burrows, pellets, feathers, and whitewash were observed in multiple locations within the Project area (Table 1 and Attachment 1). The Project area was observed to support between 9 and 24 burrowing owls at the time of the surveys (late October to early November), especially south of I-15. Twenty-four burrows with recent sign of use by burrowing owls were mapped during the botanical surveys (Table 1, Attachment 1). Live owls were observed using eight of the 24 active burrows; one additional live owl was also observed in the Project area. Representative photographs of burrowing owl burrows and sign are included in Attachment 3.

Burrowing owls are listed by the U.S. Fish and Wildlife Service (USFWS) as a Bird of Conservation Concern, by the California Department of Fish and Game (CDFG) as a Species of Special Concern (in burrowing sites and some wintering sites), and by the Bureau of Land Management (BLM) as a Sensitive species (CDFG 2012). The burrowing owl has a Global Conservation Status Rank of G4, meaning that the species is "uncommon but not rare" globally with "some cause for long-term concern due to declines or other factors" (NatureServe 2009). Its State Rank is S2, which means the species is considered "critically imperiled" in California, and is further defined as being "at very high risk of extinction or elimination due to extreme rarity, very steep declines, or other factors" (NatureServe 2009).

#### **Loggerhead shrike (*Lanius ludovicianus*)**

Loggerhead shrikes were observed in two locations within the Project area during the botanical survey; however their presence was only noted and not mapped. No nests were observed, nor were current nests expected, as February is the earliest that loggerhead shrike nests have been recorded. Loggerhead shrikes are listed by USFWS as a Bird of Conservation Concern and by the CDFG as a Species of Special Concern (during nesting) (CDFG 2012). The loggerhead shrike has a Global Conservation Status Rank of G4 and a State Rank of S4, meaning that the species is "apparently secure: uncommon but not rare" globally and in California with "some cause for long-term concern due to declines or other factors" (NatureServe 2009).

- **Desert kit fox (*Vulpes macrotis ssp. arsipus*)**

Fifty seven desert kit fox dens were found in the Project area. Both recently active and inactive natal dens and occasional-use dens were observed and mapped (Table 1 and Attachment 1). Numerous sign of desert kit fox were recorded during the botanical surveys, including two active dens, 26 inactive occasional use dens, 14 possibly active dens, 10 dens that were potentially used by kit fox, and five

inactive natal dens no live kit fox were observed (Attachment 1). Numerous desert kit fox scat were also recorded, the majority of these were associated with a den.

The desert kit fox is a protected furbearing mammal (PFM) under the California Code of Regulations. The desert kit fox has a Global Conservation Status Rank of G4, meaning that the species is "apparently secure: uncommon but not rare" globally with "some cause for long-term concern due to declines or other factors" (NatureServe 2009). Its State Rank is S2S3, which means the species is considered "critically imperiled" to "vulnerable" in California, and is at high risk of extinction or elimination (NatureServe 2009).

- **American badger (*Taxidea taxus*)**

One burrow with sign of digging by an American badger was found in the Project area (Table 1 and Attachment 1). The American badger is a CDFG Species of Special Concern. It has a Global Conservation Status Rank of G5 and a State Rank of S4, meaning that the species is "secure" and considered "common; widespread and abundant" globally, and is "apparently secure: uncommon but not rare" in California with "some cause for long-term concern due to declines or other factors" (NatureServe 2009).

**Table 1. Special-status wildlife species and sign detected during fall 2012 botanical surveys within the Soda Mountain Solar Project area.**

Common Name (Scientific Name)	Conservation Status (USFWS/State/ BLM/GRank-SRank)*	Description of Observation(s)
Desert tortoise ( <i>Gopherus agassizii</i> )	FT/ST/-/G4S2	One deteriorating carcass (> 2 years old), one recent scat, three potential burrows
Burrowing owl ( <i>Athene cunicularia</i> )	BCC/SSC/ BLMS/G4S2	Nine live owls and 24 active burrows with various sign including whitewash, pellets and feathers
Loggerhead shrike ( <i>Lanius ludovicianus</i> )	BCC/SSC/-/G4S4	Two live individuals
Desert kit fox ( <i>Vulpes macrotis ssp. arsipus</i> )	-/PFM/-/G4S2S3	Two active dens, 26 inactive occasional use dens, 14 possibly active dens, 10 potential dens, five inactive natal dens, and numerous scat
American badger ( <i>Taxidea taxus</i> )	-/SSC/-/G5S4	Burrow with sign of digging (claw marks)

**\*Conservation Status Definitions:**

**U.S. Fish and Wildlife Service (USFWS) Status**

- FE: Federally listed as Endangered
- FT: Federally listed as Threatened
- BCC: Bird of Conservation Concern

**State: California Department of Fish and Game (CDFG) Status**

- SE: State listed as endangered
- ST: State listed as threatened
- FP: Fully Protected
- SSC: Species of Special Concern

**State: California Code of Regulations**

- PFM: Protected Furbearing Mammal

**Bureau of Land Management (BLM) Status**

- BLMS: Sensitive

### **NatureServe Global and State Conservation Status Ranks**

Global (G) and State (S) Conservation Status Ranks:

GX or SX: Presumed Extinct (species)

GH or SH: Possibly Extinct

G1 or S1: Critically Imperiled: At very high risk of extinction or elimination due to extreme rarity, very steep declines, or other factors.

G2 or S2: Imperiled: At high risk of extinction or elimination due to very restricted range, very few populations or occurrences, steep declines, or other factors.

G3 or S3: Vulnerable: At moderate risk of extinction or elimination due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors.

G4 or S4: Apparently Secure: Uncommon but not rare; some cause for long term concern due to declines or other factors.

G5 or S5: Secure: Common; widespread and abundant.

### **LIST OF ATTACHMENTS**

**ATTACHMENT 1** – MAP OF SURVEY AREA WITH LOCATIONS OF OBSERVED WILDLIFE SIGN

**ATTACHMENT 2** – LIST OF WILDLIFE SPECIES OBSERVED

**ATTACHMENT 3** – REPRESENTATIVE WILDLIFE PHOTOS

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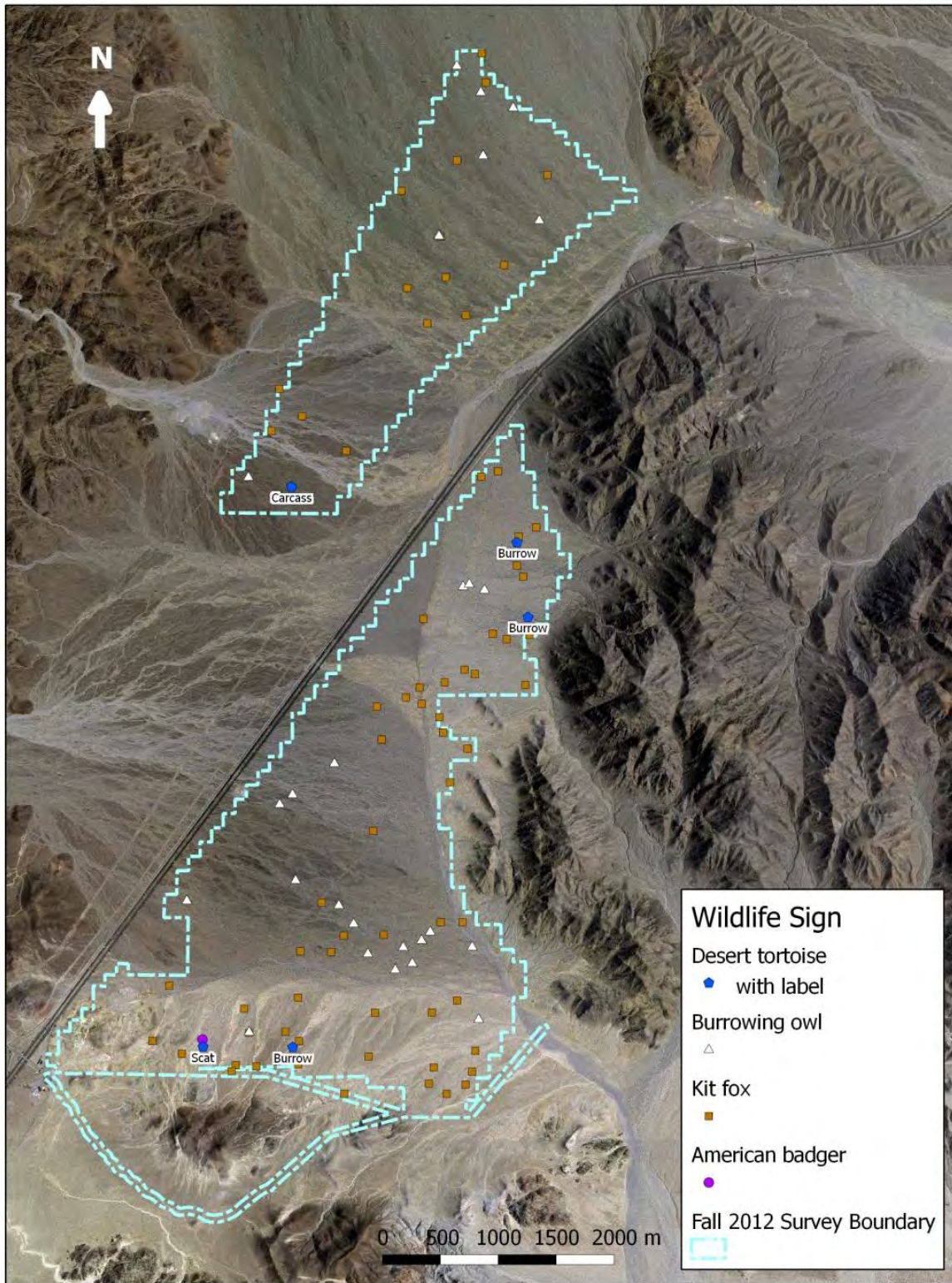
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# Attachment 1

## Map of Special-status Wildlife Observations Recorded during the Fall 2012 Botanical Survey of the Soda Mountain Solar Project Area





## Attachment 2

### List of Wildlife Species Incidentally Observed during the Fall 2012 Botanical Survey of the Soda Mountain Solar Project Area

Common Name	Scientific Name	Notes
<b>Birds</b>		
Red-tailed hawk	<i>Buteo jamaicensis</i>	
Great horned owl	<i>Bubo virginianus</i>	Sign (pellet)
Burrowing owl	<i>Athene cunicularia</i>	Live owls, occupied burrows, and sign (pellets, feathers)
Lesser nighthawk	<i>Chordeiles acutipennis</i>	
Common poorwill	<i>Phalaenoptilus nuttallii</i>	
Northern flicker	<i>Colaptes auratus</i>	Wing of dead bird
Ladder-backed woodpecker	<i>Picoides scalaris</i>	
Loggerhead shrike	<i>Lanius ludovicianus</i>	
Common raven	<i>Corvus corax</i>	
Horned lark	<i>Eremophila alpestris</i>	
Bewick's wren	<i>Thryomanes bewickii</i>	
Rock wren	<i>Salpinctes obsoletus</i>	
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	Inactive nests
Ruby-crowned kinglet	<i>Regulus calendula</i>	
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	
American robin	<i>Turdus migratorius</i>	
European starling	<i>Sturnus vulgaris</i>	
Yellow-rumped warbler	<i>Dendroica coronata</i>	
Black-throated sparrow	<i>Amphispiza bilineata</i>	
Sage sparrow	<i>Amphispiza belli</i>	
Chipping sparrow	<i>Spizella passerina</i>	
Savannah sparrow	<i>Passerculus sandwichensis</i>	
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	
Western meadowlark	<i>Sturnella neglecta</i>	
House finch	<i>Carpodacus mexicanus</i>	
Lesser goldfinch	<i>Carduelis psaltria</i>	
<b>Reptiles</b>		
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>	
Common zebra-tailed lizard	<i>Callisaurus draconoides</i>	
Common side-blotched lizard	<i>Uta stansburiana</i>	
Desert horned lizard	<i>Phrynosoma platyrhinus</i>	
Great Basin whiptail	<i>Aspidoscelis tigris ssp.tigris</i>	
Coachwhip (red racer)	<i>Masticophis flagellum ssp. flagellum</i>	

Common Name	Scientific Name	Notes
Patch-nosed snake	<i>Salvadora hexalepis</i>	
Desert tortoise	<i>Gopherus agassizii</i>	
<b>Mammals</b>		
Black-tailed jackrabbit	<i>Lepus californicus</i>	
Round-tailed ground squirrel	<i>Spermophilus tereticaudus</i>	Vocalization, burrows
American badger	<i>Taxidea taxus</i>	Sign (diggings)
Coyote	<i>Canis latrans</i>	Sign (scat and tracks)
Desert kit fox	<i>Vulpes macrotis ssp. arsipus</i>	Sign (scat and dens)
Desert woodrat	<i>Neotoma lepida</i>	Sign (middens and scat)
Kangaroo rat	<i>Dipodomys sp.</i>	Burrows, likely <i>D. deserti</i>
Mule deer or Big horn sheep*	<i>Odocoileus hemionus or Ovis canadensis nelson</i>	Sign (scat and tracks), size suggests mule deer
Feral donkey (burro)	<i>Equus asinus</i>	Sign (scat)
Botta's pocket gopher	<i>Thomomys bottae</i>	Sign (burrows)

\*Big horn sheep sign was observed in wildlife surveys conducted by Kiva Biological Consultants, 2012

### Attachment 3

#### Representative Photographs of Special-status Wildlife Species Observed during the Fall 2012 Botanical Survey of the Soda Mountain Solar Project Area



Photo 1. Example of occupied burrowing owl burrow in the Project area.



Photo 2. Burrowing owl pellet at entrance to active burrow pictured above.



Photo 3. Example of occupied burrowing owl burrow in the Project area.



Photo 4. Desert tortoise carcass found in the Project area north of Interstate 15.





Photo 5. Burrowing owl pellet found in the Project area.



Photo 6. Old kit fox burrow being occupied by a burrowing owl in the Project area.



Photo 7. Example of burrow occupied by burrowing owl with pellets, whitewash, and feathers in the Project area.



Photo 8. Another occupied burrowing owl burrow with pellets, whitewash, and feathers in the Project area.