

**MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND  
SPECIAL STATUS PLANTS**

PRELIMINARY DRAFT: August 2007

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Project site location: USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1  
West, portion of Section 13.

APN:

Owner /Applicant:

Principal Investigator: Scott D. White, Scott White Biological consulting (above).

CERTIFICATION: I hereby certify that the statements furnished in this report and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me and under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

**DRAFT REPORT ONLY**

DATE: \_\_\_\_\_ SIGNED: \_\_\_\_\_  
Scott D. White, Report Author

Additional field work performed by:

DATE: \_\_\_\_\_ SIGNED: \_\_\_\_\_  
Justin Wood

# MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

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# **MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS**

Scott D. White  
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PRELIMINARY DRAFT: July 2007

## **I: SUMMARY**

The Moon Camp property supports two sensitive plant communities (Pebble Plain and meadow habitats), one federally listed plant species (ash-gray Indian paintbrush) and four State Species of Special Concern (Parish's rock-cress, Big Bear Valley woollypod, Heckard's paintbrush, and silver-haired ivesia). Project development is expected to have both direct and indirect impacts to these sensitive biological resources. Several recommendations are discussed to minimize these impacts.

## **II: PROJECT AND PROPERTY DESCRIPTION**

The San Bernardino County Planning Department is reviewing an application for residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of Fawnskin, in unincorporated San Bernardino County. It is about 62 acres, on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from 6,960 feet in the northeastern portion of the site to 6,750 feet near the lakeshore (see Exhibits 1 and 2).

The project site occurs within an area that is described by the Open Space element of San Bernardino County's General Plan as, "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

This report addresses the potential presence of two special status plant communities and several sensitive plant species occurring or potentially occurring on the property.

## **III. FOCUSED STUDY / SPECIES OF CONCERN**

There are four federally listed threatened or endangered plant species endemic to meadows and three federally listed threatened or endangered plant species endemic to "pebble plain" habitat in the Big Bear Valley area of the northern San Bernardino Mountains (USDI Fish and Wildlife Service 1984, 1998). In addition, there are numerous other special status plant species occurring in this area (Appendix 2). This report focuses on the following plant species:

**Exhibit 1: TBD**

**Exhibit 2: TBD**

#### Meadow Species:

- San Bernardino bluegrass (*Poa atropurpurea*) (federally endangered);
- Bird-foot checkerbloom (*Sidalcea pedata*) (federally and state endangered);
- California dandelion (*Taraxacum californicum*) (federally endangered); and
- Slender-petaled thelypodium (*Thelypodium stenopetalum*) (federally endangered).

#### Pebble Plain Species:

- Bear Valley sandwort (*Arenaria ursina*) (federally threatened);
- Ash-gray Indian paintbrush (*Castilleja cinerea*) (federally threatened); and
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) (federally threatened).

Previous surveys of the Project Site identified ash-gray Indian paintbrush as present on the site (Michael Brandman Associates 2000; White & Leatherman BioServices 2002). White and Leatherman (2002) also mapped the extent of suitable habitat for ash-gray Indian paintbrush, based on the extent of its host plant, Wright's matting buckwheat. Bear Valley sandwort was reported as occurring on the site in the California Natural Diversity Data Base (California Department of Fish and Game 2007).

## **IV. METHODS**

Available literature relative to special status plants or plant communities known from the project site and vicinity were reviewed. Literature sources included previous biological reports (Michael Brandman Associates 2000; White & Leatherman BioServices 2002), the California Natural Diversity Data Base (California Department of Fish and Game 2007a, USGS Fawnskin, Big Bear City, Big Bear Lake, Butler Peak, Keller Peak, and Moonridge 7½' topographic quads), California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001), the CNPS *Electronic Inventory* (2007, for the same quads) and compendia of special status species published by the US Fish and Wildlife Service (2006) and California Department of Fish and Game (2007b). All species identified by this literature review, and others known from the general region, are included in Appendix 1 or 2 (attached). Appendix 1 lists those species not considered for this report due to elevational or geographic ranges, or specialized habitat requirements not found on the site. Appendix 2 lists special status species known from comparable habitats in the region and summarizes their natural history, conservation status, and occurrence probability onsite.

Scott D. White and Justin Wood (Scott White Biological Consulting) surveyed pebble plains habitat found on the site on 30 April, 7 June, and 8 August 2007. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), Abrams (1923-1960), and other regional references. All species noted on the site are listed in Appendix 3.

Surveys were conducted in conformance with California Department of Fish and Game guidelines (2000), during flowering seasons for the above listed special status plants. It should be noted that very low rainfall in 2006-2007 and surveys may not be conclusive for all annual plants.

Maps produced previously by White and Leatherman BioServices (2002) of the pebble plain habitat and open upland habitat supporting Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) were used as base maps for this study.

## V. RESULTS

Due to the drought conditions, the authors used previous reports and their own judgment of habitat quality to estimate the probability that each special status plant might occur on the site.

### A. PLANT COMMUNITIES

The following two plant communities were dominant plant communities found on the site:

#### Jeffrey Pine Forest

Most of the site above Highway 38 is covered by the Jeffrey pine series (Sawyer and Keeler-Wolf 1995). This vegetation also matches descriptions of Jeffrey pine forest (Holland 1986; McBride 1988), and montane coniferous forest (Munz 1959). Jeffrey pine forest covers most of the eastern half of the project site and occurs in patches interspersed with pebble plains (below) in the western half (see Exhibit 3). Jeffrey pine (*Pinus jeffreyi*) is the dominant tree; white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kelloggii*) occur throughout Jeffrey pine forest, at lower densities. The understory is sparse, consisting of scattered shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), cupleaf ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbes in scattered patches. Jeffrey pine forest occurs in mountains throughout most of California at elevations between about 5000 and 9000 feet. Many local and regional associations have been described (Sawyer and Keeler-Wolf 1995).

#### Shoreline Habitats

Most plants along the shore itself are herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium ciliatum*), wire-grass (*Juncus arcticus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Numerous seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur there.

Just above the high-water level, there are small patches of various upland and wetland vegetation types. These patches are too small to map. Small areas of Jeffrey pine forest are interspersed open wet meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). There are no alkaline meadow or dry meadow habitats (below) along the lake shore.

#### Sensitive Plant Communities

In addition to the above common plant communities, two sensitive plant communities were identified on the project site. Exhibit 3 shows the location of each of these sensitive plant communities.

**Exhibit 3: TBD**



### ***Pebble Plain Plant Community***

Pebble plain plant community occurs on XX acres within the western portion of the site north of Highway 38. This habitat occurs in smaller patches to the east (see Exhibit 3). The Pebble plain plant community (also called pavement plain) was described by Derby and Wilson (1978, 1979). A detailed discussion was prepared by the San Bernardino National Forest (1990) and brief descriptions appear in Holland (1986) and Sawyer and Keeler-Wolf (1995). This plant community is characterized by an underlying layer of clay soil with quartzite pebbles and gravel that are continually pushed to the surface, evidently through frost action (Holland 1986). Vegetation structure on these sites is similar to the mat-forming structure of alpine sites at much higher elevations. Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. At least two species, both listed as endangered, are endemic to the Big Bear pebble plain plant community: Bear Valley sandwort and southern mountain buckwheat (Derby and Wilson 1978).

On the Moon Camp site, much of the pebble plain habitat has been disrupted by vehicle use on the site. This disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for the sensitive pebble plain plant species (San Bernardino National Forest 1990). The Forest Service has determined that vehicle disturbance does not permanently alter habitat suitability for these species. The Forest Service has fenced degraded pebble plains in the Sugarloaf area and found that plant diversity returns after a few years.

The pebble plain plant community onsite has been classified as “southern montane black sagebrush pebble plains” by CDFG (2002). This plant community is “a series or association considered rare and worthy of consideration” by the California Natural Diversity Data Base.

### ***Meadow Habitats***

Small patches of dry and wet meadows occur along the lakeshore, south of Highway 38. They grade into upland grasslands, and we could not delineate their extent due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., “wet meadows”) or may have saturated soils only seasonally or during wet years (called “dry meadows,” “xeric meadows,” or “vernal meadows”). Meadows of the San Bernardino Mountains were described by Krantz (1994). They are generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows support sagebrush (*Artemisia tridentata*, *A. rothrockii*). These meadows themselves are not ranked as special status communities by CDFG (2002) but several locally endemic plants occur in them and they, therefore, are recognized locally as important habitats (Krantz, no date).

## **B. SENSITIVE PLANT AND WILDLIFE SPECIES**

Big Bear Valley has a high proportion of rare and locally endemic species (Krantz, no date; Krantz 1994). All of these species are addressed in Appendix 1 or 2 (habitat and range, agency status and probability of occurring on the site). Only those species potentially occurring on the site (see Appendix 2) are discussed below.

### **Listed Threatened or Endangered Plants Identified on the Site**

**Ash-gray Indian paintbrush (*Castilleja cinerea*):** Ash-gray Indian paintbrush is a federally-listed threatened species and is on CNPS’s List 1B. It is a root parasite on other plants, often parasitizing the listed threatened southern Mountain buckwheat (below) or a similar but common mat-forming

buckwheat (*E. wrightii* ssp. *subscaposum*). It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows and seeps, and open pinyon or Jeffrey pine forest between about 5,900 and 10,000 feet elevation. It is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). It was mapped on the project site by Michael Brandman Associates (2000) and in the California Natural Diversity Data Base (2007). This survey confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

### **Sensitive Plants Occurring on the Site**

**Parish's rock-cress (*Arabis parishii*):** Parish's rock cress is CNPS's List 1B. It is a perennial herb that typically blooms in April or May. It occurs in pebble plains, and other sites with heavy or rocky soils, including carbonate soils, within pinyon woodlands and montane forests between about 3,900 and 8,000 feet elevation. It is endemic to the San Bernardino Mountains. Suitable habitat occurs on the project site in areas shown on Exhibit 3. This survey confirmed its presence onsite and noted no substantial changes to densities or distribution in 2007.

**Big Bear Valley woollypod (*Astragalus leucolobus*):** Big Bear Valley woollypod is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in rocky soils of montane conifer forests and woodlands and pebble plains, between about 5,600 and 8,000 feet elevation. It is endemic to the high mountains of southern California (San Bernardino, San Gabriel, San Jacinto, and Santa Rosa Mountains). Suitable habitat is found throughout the site. White & Leatherman BioServices (2002) observed it occasionally throughout the project site. This survey confirmed these occurrences and noted that it was especially common on pebble plains in 2007.

**Heckard's paintbrush (*Castilleja montigena*, *C. applegateii* ssp. *martinii*):** Heckard's paintbrush is on CNPS's List 4. It is a perennial herb, typically flowering between May and August. It occurs in montane forests between about 6,400 and 9,200 feet elevation. It is endemic to the San Bernardino Mountains, where it is common in forest habitats throughout the mountain range. It was originally described by Lawrence Heckard (1980), but Heckard regarded it as a minor variant of *Castilleja applegateii* and not as a distinct species in his Jepson Manual treatment of the genus (1993). This survey found it occurring occasionally in Jeffrey pine forest on the Moon Camp site.

**Silver-Haired Ivesia (*Ivesia argyrocoma*):** Silver-haired ivesia is on CNPS's List 1B. It is a perennial herb that typically blooms between June and August. It occurs in alkaline meadows and seeps, pebble plains, and montane forest between about 4900 and 8800 feet elevation. It occurs in the San Bernardino Mountains and a disjunct site in the mountains of Baja California. It was reported on the project site by Michael Brandman Associates (2000) and White and Leatherman BioServices (2002). This survey observed it throughout the pebble plain habitat (Exhibit 3).

### **Listed and Candidate Threatened or Endangered Plants Potentially Occurring on the Site**

**Bear Valley sandwort (*Arenaria ursina*):** Bear valley sandwort is a federally-listed as threatened and is on CNPS's List 1B. It is a perennial herb and typically blooms from May to August. It occurs in pebble plains and sometimes in carbonate soils, between about 6,400 and 6,900 feet elevation. It is endemic to Big Bear Valley in the San Bernardino Mountains. It has been reported from the Moon Camp site (CNDDDB 2007), but was not observed in 2007 nor was it observed by Michael Brandman Associates (2000) or White & Leatherman BioServices (2002). Due to poor rainfall in 2006-07, this survey could not evaluate whether Bear Valley sandwort was present or absent from

the site. Suitable habitat occurs in pebble plains on the project site, and this survey determined that there is a high probability of it occurring onsite.

**Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*):** Southern mountain buckwheat is federally listed as threatened and is on CNPS's List 1B. It is a mat-forming woody perennial, generally flowering late in the season (between about June and August). It is endemic to pebble plains habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains, between about 5,800 and 7,500 feet elevation. It often serves as a host plant for the hemi-parasitic *Castilleja cinerea* (above) and also is a food plant for a newly described locally-endemic San Bernardino blue butterfly. It is very similar to a more common Wright's matting buckwheat (*E. wrightii* ssp. *subscaposum*), which is common on the project site. The two species are distinguished by presence or absence of branching in their inflorescences (Hickman 1993; Reveal 1989, 2005). We examined flowers and remains of dried inflorescences of mat-forming buckwheats throughout the project site on each site visit. Most of them were either unidentifiable (due to absence of inflorescences) or were identified as Wright's matting buckwheat, based on their branching inflorescences. Within the mapped pebble plain habitat, about 10-20% of the matting buckwheat plants had mostly unbranched inflorescences during the 8 August site visit. Reveal (2005) noted that the two plants intergrade to some extent in Big Bear Valley and A. Sanders (pers. comm.) has made similar observations. It was concluded that some of the matting buckwheats on pebble plains at the Moon Camp site are intergradations between the endangered southern mountain buckwheat and the common Wright's matting buckwheat.

**San Bernardino bluegrass (*Poa atropurpurea*):** San Bernardino bluegrass is a federally listed endangered species and is on CNPS's List 1B. It is a rhizomatous perennial grass that typically flowers between May and June. It occurs in mesic meadows and seeps between about 4,400 and 8100 feet elevation. It is known only from the San Bernardino Mountains and Laguna mountains (San Diego County). Although marginally suitable habitat occurs along the lakeshore areas on the project site, San Bernardino bluegrass was not observed onsite. Based on habitat, it was concluded there is a low probability that it may occur there.

**Bird's foot checkerbloom (*Sidalcea pedata*):** Bird's foot checkerbloom is a federally- and state-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in meadows and seeps, between about 5,200 and 8,100 feet elevation. It is endemic to the San Bernardino Mountains. Although marginally suitable habitat occurs near the lakeshore, bird's foot checkerbloom was not observed during field surveys. It was not reported as occurring in previous surveys. Based on habitat, it was concluded that there is a low probability that it may occur.

**California dandelion (*Taraxacum californicum*):** California dandelion is a federally-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It is endemic to the San Bernardino Mountains, occurring only in and around Big Bear Valley, in meadows and seeps between about 6,300 and 7,800 feet elevation. Although marginally suitable habitat occurs in meadow areas near the lakeshore, the species was not observed during the surveys or reported in prior surveys. Based on habitat, it was concluded that there is a low probability that it may occur onsite.

## Sensitive Plants Potentially Occurring Onsite

Although not observed during the survey, the following sensitive plant species were judged as having a moderate or high probability of occurring onsite:

**Table 1**  
**Sensitive Plant Species Having a Moderate or High Probability of Occurring Onsite**

Species	Scientific Name	Probability	Location
Rock sandwort	<i>Arenaria lanuginosa</i> ssp. <i>saxosa</i>	Moderate probability	meadow, lakeshore
Crested milk vetch	<i>Astragalus bicristatus</i>	High probability	rocky areas
Big Bear Valley milk vetch	<i>Astragalus lentiginosus</i> var. <i>sierrae</i>	High probability	open forest
Palmer's mariposa lily	<i>Calochortus palmeri</i> var. <i>palmeri</i>	Moderate probability	meadow
Western sedge	<i>Carex occidentalis</i>	Moderate probability	meadow
San Bernardino Mountain owl's clover	<i>Castilleja lasiorhyncha</i>	Moderate probability	meadow
San Bernardino Mountains dudleya	<i>Dudleya abramsii</i> ssp. <i>affinis</i>	Moderate probability	pebble plains
Southern Sierra woolly sunflower	<i>Eriophyllum lanatum</i> var. <i>obovatum</i>	High probability	forest
Jepson's bedstraw	<i>Galium jepsonii</i>	High probability	forest
Johnston's bedstraw	<i>Galium johnstonii</i>	Low to moderate probability	forest
Parry's sunflower	<i>Hulsea vestita</i> ssp. <i>parryi</i>	Low to moderate probability	open slopes
Duran's rush	<i>Juncus duranii</i>	Moderate probability	meadow
Short-sepaled lewisia	<i>Lewisia brachycalyx</i>	Moderate probability	meadow
Baldwin Lake linanthus	<i>Linanthus killipii</i>	High probability	pebble plains
San Bernardino Mountain monkeyflower	<i>Mimulus exiguus</i>	High probability	meadow margin, etc.
Purple monkeyflower	<i>Mimulus purpureus</i>	High probability	meadow margin, etc.
Chickweed oxytheca	<i>Oxytheca caryophylloides</i>	High probability	open forest
Parish's yampah	<i>Perideridia parishii</i> ssp. <i>parishii</i>	Low to moderate probability	meadow
Transverse Range phacelia	<i>Phacelia exilis</i>	High probability	meadow margin, etc.
Mojave phacelia	<i>Phacelia mohavensis</i>	High probability	meadow margin, etc.

**Table 1 (Cont.)  
Sensitive Plant Species Having a Moderate or High Probability of Occurring Onsite**

<b>Species</b>	<b>Scientific Name</b>	<b>Probability</b>	<b>Location</b>
Bear Valley phlox	<i>Phlox dolichantha</i>	High probability	throughout
Bear Valley pyrrocoma	<i>Pyrrocoma uniflora</i> ssp. <i>gossypina</i>	Low - moderate probability	meadow
Parish's rupertia	<i>Rupertia rigida</i>	High probability	throughout
Tehachapi ragwort	<i>Senecio ionophyllus</i>	Moderate probability	throughout
Laguna Mountains jewelflower	<i>Streptanthus bernardinus</i>	Moderate probability	forest
Southern jewelflower	<i>Streptanthus campestris</i>	High probability	forest
Pine green-gentian	<i>Swertia neglecta</i>	High probability	Forest
Small-flowered bluecurls	<i>Trichostema micranthum</i>	High probability	meadow

**C. SAN BERNARDINO COUNTY PROTECTED PLANTS**

The San Bernardino County Native Plant Protection policy (1989) regulates removal of trees greater than 6 inches diameter at breast height (dbh), smoke trees, mesquite, creosote rings, and all plants in the agave family, including Joshua trees. Although there are no smoke trees, mesquite, creosote rings or species in the agave family that occur on property, Jeffrey pines and other native forest trees greater than 6 inches dbh do occur onsite. An arborist survey and report on these trees is recommended.

**VI. IMPACTS**

**A. IMPACTS TO SPECIAL STATUS PLANTS AND HABITAT**

Project construction includes grading new roads, driveways and building pads throughout most of the property, and the loss of some of the native vegetation. Pebble plains and open forest patches on the site are occupied by at least one threatened or endangered plant (ash-gray Indian paintbrush) and four other sensitive but unlisted plant species (Parish’s rock-cress, Heckard’s paintbrush, Bear Valley woollypod and silver-haired ivesia). Development could eliminate or substantially reduce the populations of all five plant species populations. Although these habitats are somewhat degraded by vehicles and invasive plants, adverse impacts to listed species would meet the CEQA threshold for mandatory findings of significance.

Similarly, development could eliminate or substantially reduce the populations of five other listed plants that potentially occur on the site but were not identified during previous surveys. These species include Bear Valley sandwort, southern mountain buckwheat, bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion. Impacts to any of those species, if present, would meet the CEQA threshold for mandatory findings of significance if any of these listed plants occur on the site.

Impacts to the sensitive but unlisted plants listed in Table 1 generally would not meet the CEQA threshold for mandatory findings of significance.

## **VII. RECOMMENDATIONS**

### **A. AGENCY CONSULTATION OR FURTHER STUDIES**

To minimize loss of forest canopy on the property, we recommend that an arborist map and inventory trees on the site, and designing roads and building sites to minimize the number of overstory trees to be removed. Once those trees that must be removed are identified, we recommend applying to San Bernardino County for applicable permits under the County's native plant protection policy.

### **B. MITIGATION MEASURES**

#### **1. Additional Surveys**

Surveys of wet meadow habitat near the lakeshore should be repeated to determine presence or absence of the listed threatened or endangered species whose presence or absence could not be determined this year. If the surveys determine that one or more listed species occurs in the meadow area, then additional compensation will be required.

#### **2. Avoidance or Minimization**

Avoiding or minimizing impacts to sensitive plant habitat is the preferred mitigation measure. However, this mitigation measure would likely reduce project feasibility. It may not provide long-term conservation of the listed plants due to the isolation that will result from project development.

#### **3. Off-site Compensation**

Off-site compensation is an available mitigation measure for impacts to ash-gray Indian paintbrush and the pebble plain habitat. The San Bernardino National Forest actively manages to preserve pebble plain habitat, including areas supporting ash-gray paintbrush. There are numerous privately-owned sites in the Big Bear Valley that support pebble plain that could be purchased and managed for conservation. In addition, the California Wildlife Foundation has established a fund, administered by the California Department of Fish and Game, for the purchase and conservation of pebble plain habitat in the Big Bear area.

It is recommended that the anticipated loss of a federally listed threatened plant (ash-gray Indian paintbrush) and pebble plain habitat be mitigated by contributing to the funding of purchase and management of off-site habitat through the California Wildlife Foundation fund. It is anticipated that mitigation will be required at 3:1 ratio.

#### **4. Onsite Management**

Impacts to the pebble plains habitat and sensitive plants will be minimized by the project's design, which will place the pebble plain area, particularly the area occupied ash-gray Indian paintbrush habitat, into a permanently protected open space. The long-term conservation value of the proposed open space requires active onsite land management to prevent "edge effects" from

existing and proposed new adjacent land uses. Exhibit 4 shows these areas on the project site that would be expected to be subject to edge effects.

The following discussion of edge effects on rare plants is based on an analysis by the Conservation Biology Institute (2000) addressing San Fernando Valley spineflower, an endemic southern California species threatened by development and surrounding land uses in the Santa Clarita Valley. Sensitive plants found near developed lands tend to die out due to a variety of edge effects, including:

- Exclusion by invasive weedy plants introduced deliberately or accidentally into developed landscapes;
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation.
- Altered hydrology caused by irrigation overspray, road runoff, or water diversions installed for erosion control;
- Direct damage by pets and feral animals (e.g., digging by dogs and cats);
- Indirect effects of non-native animals, such as elimination of native pollinators by invasive Argentine ants;
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes; and
- Pollution from over-sprayed or runoff landscaping chemicals (insecticides, herbicides, fertilizers).

Conservation planners can design “buffer areas” to separate managed sensitive species or habitat areas from the indirect effects from adjacent land uses. Roads, trails, or fuel modification land uses were not considered consistent with buffer function. The Conservation Biology Institute analysis (2000) estimated that buffer widths of 200 feet would be “highly likely to be effective” in buffering sensitive plant occurrences from a series of adverse edge effects from adjacent land uses.

Most land surrounding the proposed Moon Camp site is in private ownership, except in the northeastern corner where National Forest land is adjacent to the north and east. None of the surrounding private land is managed as either a buffer area or for conservation. Most of the adjacent land has been developed and would not be available for conservation or a buffer area. The proposed project will be subject to substantial edge effects from adjacent residential development and roads, especially Highway 38 (see Exhibit 4).

## **IX. CONCLUSION**

Two sensitive plant communities (Pebble Plain and meadow habitats) occur on the project sites. These two plant communities support an array of endemic plant species, including the federally threatened ash-gray Indian paintbrush and four plant species of special concern (Parish’s rock-cress, Big Bear Valley woollypod, Heckard’s paintbrush, and silver-haired ivesia). Development of the project site is expected to result in direct and indirect impacts to the sensitive plant communities and associated endemic plant species. Several recommendations are made to help minimize these impacts.

## Literature Cited

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## **Appendix 1: Special Status Species Not Addressed**

**Appendix 1: Special Status Plants of the Bear Valley Region  
Not Addressed Due to Habitat or Range**

Common name	Latin name	Reason for exclusion
White-margined everlasting	<i>Antennaria marginata</i>	Outside geogr. range (only local occurrences in Barton Flats area)
Pinyon rock-cress	<i>Arabis dispar</i>	Outside geogr. range (only local occurrences on desert-facing slopes)
Shockley's rock-cress	<i>Arabis shockleyi</i>	Outside geogr. range (only local occurrences on desert-facing slopes)
Cushenbury milk-vetch	<i>Astragalus albens</i>	No suitable habitat (carbonate)
Triple-ribbed milk-vetch	<i>Astragalus tricarinatus</i>	No habitat (desert shrubland), well above elev. range (below about 4000 ft.), Cushenbury Cyn report erroneous
Parish's small-scale	<i>Atriplex parishii</i>	No suitable habitat (alkali sink)
Fremont barberry	<i>Berberis fremontii</i>	No local occurrences (presumed extinct in Cushenbury area)
Scalloped moonwort	<i>Botrychium crenulatum</i>	No suitable habitat (marshes, bogs)
Plummer's mariposa lily	<i>Calochortus plummerae</i>	Above elev. range (below about 5500 ft.)
Alkali mariposa lily	<i>Calochortus striatus</i>	No habitat (desert alkaline meadows, seeps) above elev. range (below about 5300 ft.)
Parish's daisy	<i>Erigeron parishii</i>	No suitable habitat (carbonate)
Cushenbury buckwheat	<i>Eriogonum ovalifolium var. vineum</i>	No suitable habitat (carbonate)
Moss gentian	<i>Gentiana fremontii</i>	Well below elev. range (occurs in San Gorgonio Wilderness)
Los Angeles sunflower	<i>Helianthus nuttallii ssp. parishii</i>	Well above elev. range (below about 4000 ft. elev.)
Barton Flats horkelia	<i>Horkelia wilderae</i>	Outside geogr. range (endemic to Barton Flats area)
California satintail	<i>Imperata brevifolia</i>	Well above elev. range (below about 3000 ft.)
San Bernardino Mtn. bladderpod	<i>Lesquerella kingii ssp. bernardinus</i>	No habitat (carbonate)
Adder's mouth	<i>Malaxis monophyllos ssp. brachypoda</i>	Well below elev. range (occurs in San Gorgonio Wilderness)
Cienega Seca oxythexca	<i>Oxytheca parishii var. cienegensis</i>	Outside geogr. range (known only from Cienega Seca and Pipes Cyn areas)
Cushenbury oxytheca	<i>Oxytheca parishii var. goodmaniana</i>	No habitat (carbonate)
Frosted mint	<i>Poliomintha incana</i>	No suitable habitat (desert dunes and sandy flats)
Narrow-leaved cottonwood	<i>Populus angustifolia</i>	No San Bernardino Mountain occurrences (local reports unverified)
Latimer's woodland gilia	<i>Saltugilia latimeri</i>	No habitat (desert shrubland, pinyon woodland); above elev. range (below about 6200 ft.)
Slender-petaled thelypodium	<i>Thelypodium stenopetalum</i>	No habitat (alkaline meadows)

## **Appendix 2: Special Status Species**

**Appendix 2: Special Status Species Potentially Occurring on the Project Site**

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Abronia nana</i> ssp. <i>covillei</i> Coville's dwarf abronia	Perennial herb; carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E. Mojave, about 5,200 - 10,200 ft.	May - August	Fed: none Calif: S3.2 CNPS List 4.2	Low (marginally suitable habitat)
<i>Allium parishii</i> Parish's onion	Bulb; open shrubland & woodland, gen. sandy bajadas or mtn slopes, often carbonate soil, about 3000 – 5,500 ft. elev.; N San Bern Mtns and Moj Des Mtns, to W Ariz.	Apr - May	Fed: none Calif: S3.3? CNPS List 4.3	Minimal (above elev. range)
<i>Arabis parishii</i> Parish's rock cress	Perennial herb; pebble plains, occas. on carbonate soil; open dry sites in conifer forest; about 5,800 – 9,500 ft. elev.; San Bernardino Mtns. endemic	April - May	Fed: none Calif: S2.1 CNPS List 1B. 2	Occurs (2007 survey; NDDDB report)
<i>Arenaria lanuginosa</i> ssp. <i>saxosa</i> ( <i>A. confusa</i> ) Rock sandwort	Perennial herb; sandy soils, streams or meadows; about 5900 to 8600 ft. elev.; San Bernardino Mtns, W US and N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS List 2.3	Moderate (moderately suitable habitat)
<i>Arenaria ursina</i> Bear Valley sandwort	Perennial herb, pebble plains, occas. on carbonate soils, about 5,900 – 9,500 ft. elev.; San Bernardino Mtns. endemic	June - July	Fed: THR Calif: S 2.1 CNPS: List 1B.2	Occurs? (NDDDB record #23)
<i>Aster bernardinus</i> ( <i>Symphoricarpon defoliatum</i> ) San Bernardino aster	Perennial herb; wetlands and margins, near sea level to about 6,700 ft. elev.; formerly widespread, Kern Co to San Diego Co, but most sites extirpated	July - Nov	Fed: none Calif: S 3.2 CNPS List 1B.2	Low (field surveys; upper margin of elev. range)
<i>Astragalus bicristatus</i> Crested milk vetch	Perennial herb; rocky slopes, montane conifer forest; about 5,500 – 9,000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	May - August	Fed: none Calif: S3.3 CNPS List 4.3	High (suitable habitat occurs)
<i>Astragalus lentiginosus</i> var. <i>sterrae</i> Big Bear Valley milk vetch	Perennial herb; open rocky soils or compacted areas in pine forest; about 5,900 – 8,500 ft. elev.; San Bernardino Mtns endemic	April - August	Fed: none Calif: S1? CNPS List 1B.2	High (suitable habitat occurs)
<i>Astragalus leucolobus</i> Bear Valley woollypod	Perennial herb; open or disturbed soils, pine forests and sagebrush scrub, about 5,600-8,800 ft. elev.; San Gabriel Mtns to Santa Rosa Mtns	May - July	Fed: none Calif: S 2.2 CNPS List 1B.2	Occurs

**Appendix 2: Special Status Species Potentially Occurring on the Project Site**

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Calochortus palmieri</i> vars. <i>palmieri</i> and <i>munzii</i> Palmer's & Munz's mariposa lilies	Bulb; meadows or seasonally moist sites; about 3,300 – 7,200 ft. elev.; var. <i>palmieri</i> occurs S Coast & Transverse Ranges, reported but not verified San Jacinto Mtns; var. <i>munzii</i> endemic to San Jacintos, reported but not verified in San Bernardino	May - July	Fed: none CNPS List 1B.2  var <i>palmieri</i> : Calif: S 2.1 var: <i>munzii</i> : Calif: S 1.2	Moderate (marginally suitable habitat)
<i>Carex occidentalis</i> Western sedge	Rhizomatous perennial; meadows & seeps; San Bernardino Mtns, White Mtns, scattered in western states; about 6,200 - 10,300 ft. elev.	June - Aug	Fed: none Calif: S2S3 CNPS List 2.3	Moderate (marginal habitat)
<i>Castilleja cinerea</i> Ash-gray Indian paintbrush	Perennial herb; pebble plains, dry meadows, about 5,900 to 9,100 ft. elev.; partially parasitic usually on matting buckwheats; San Bernardino Mtns endemic	May - August	Fed: THR Calif: S2.2 CNPS List 1B.2	Occurs (field survey and CNDDb report)
<i>Castilleja lasiorhyncha</i> ( <i>Orthocarpus lasiorhynchus</i> ) San Bernardino Mountain owl's clover	Annual; meadows, streamsides, seeps, etc., about 4,200-7,800 ft. elev.; San Bernardino Mtns, and (historically) San Jacinto Mtns.; reports from San Diego Co. unconfirmed	June - Aug	Fed: none Calif: S2.2 CNPS List 1B.2	Moderate (marginal habitat)
<i>Castilleja applegatei</i> ssp. <i>martini</i> H <i>C. angustifolia</i> (= <i>C. montigena</i> , <i>C. martini</i> var. <i>ewanii</i> ) Heckard's paintbrush	Perennial herb; conifer forest; San Bernardino Mountains endemic (treated as a species by CNPS but considered a hybrid by Chung & Heckard in Jepson Manual)	March - July	Fed: none Calif: S3.3 CNPS List 4.3	Occurs (Jeffrey pine forest)
<i>Dryopteris filix-mas</i> Male fern	Perennial herb; widespread in N hemisphere, esp. at high latitudes; only two reports in Calif., incl. Holcomb Valley	July - Sept.	Fed: none Calif: S 1.3 CNPS List 2.3	Low (local rarity)
<i>Dudleya abramsii</i> ssp. <i>affinis</i> San Bernardino Mts. dudleya	Perennial herb, pebble plains & rock outcrops (often carbonate); pinyon woodland, open pine forests, about 5,200-8,500 ft. elev.; San Bernardino Mtns endemic	April - June	Fed: none Calif: S 2.2 CNPS: List 1B.2	Moderate (marginal habitat)
<i>Eriogonum foliosum</i> ( <i>E. evanidum</i> ) Leaty buckwheat	Annual; sandy soil, woodlands or shrublands; about 3,900-7,200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.; may be extinct in Calif.	July - Oct.	Fed: none Calif: SH CNPS List 1B.2	Minimal (presumed extinct, local rarity)

**Appendix 2: Special Status Species Potentially Occurring on the Project Site**

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Eriogonum kennedyi</i> var. <i>astronomontanum</i> Southern mountain buckwheat	Matting woody perennial; pebble plains and similar soils, about 5,800 – 7,800 ft. elev.; nearly endemic to Big Bear area, also reported at Mt. Pinos	July - August	Fed: THR Calif: S2.2 CNPS: List 1B.2	Apparent introgression w/ Wright's buckwheat (see text)
<i>Eriogonum microthecum</i> var. <i>lacus-ursi</i> Bear Lake buckwheat	Subshrub; montane forests and shrublands; only known occurrence at Big Bear Lake shore ca. 7,200 ft. elev.	July - Sept	Fed: none Calif: S 1 CNPS List 1B.1	Minimal (field survey)
<i>Eriophyllum lanatum</i> var. <i>obovatum</i> Southern Sierra woolly sunflower	Perennial herb; open montane coniferous forests, 4,200-8,200 ft. elev.; S Sierra Nevada and western San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Galium jepsonii</i> (G. <i>angustifolium</i> var. <i>subglabrum</i> ) Jepson's bedstraw	Perennial herb; sandy or gravelly soils; montane conifer forest, 6,500-8,100 ft. elev.; San Gabriel and San Bernardino Mtns	July - August	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Galium johnstonii</i> (G. <i>angustifolium</i> var. <i>pinetorum</i> ) Johnston's bedstraw	Perennial herb, dry slopes, chaparral, lower montane forest, pinyon and juniper woodland; about 4,000-7,600 ft. elev.; San Bernardino, San Gabriel, maybe San Jacinto mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Low-moderate (suitable habitat occurs; margin of elev. range)
<i>Gilia leptantha</i> ssp. <i>leptantha</i> San Bernardino Mtn. gilia	Annual; sandy or gravelly soils, open pine forest; endemic to upper Santa Ana Riv. watershed, San Bernardino Mtns, about 5,000 to 7,700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (probably outside geogr. range)
<i>Heuchera hirsutissima</i> Shaggy-haired alum root	Perennial herbs; rocky outcrops, cliffs, slopes; montane forest or alpine boulderfields; above about 4,800 ft. elev.; <i>H. hirsutissima</i> is endemic to San Jacinto and Santa Rosa Mtns (unconfirmed from San Bernardino Mtns); <i>H. parishii</i> endemic to San Bernardino Mtns	May - July	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (poorly suitable habitat)
<i>Heuchera parishii</i> Parish's alumroot				
<i>Hulsea vestita</i> ssp. <i>parryi</i> Parry's sunflower	Perennial herb; gen. conifer forests, on loose eroding soil and talus; San Bernardino Mtns and Little San Bern. Mtns; about 5,500-9,500 ft. elev.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	Low-moderate (marginal habitat)

**Appendix 2: Special Status Species Potentially Occurring on the Project Site**

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Ivesia argyrocoma</i> Silver-haired ivesia	Perennial herb; pebble plains, seasonal meadows, drainages; about 4,900-8,800 ft. elev.; San Bernardino Mtns and a long-disjunct site in Baja Calif mtns	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Occurs (field survey & NDDB record)
<i>Juncus duranii</i> Duran's rush	Perennial herb; meadows, seeps, etc., montane forest; about 5,800-9,000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	July - August	Fed: none USFS: none Calif: S 3.3 CNPS: List 4.3	Low (marginal habitat occurs)
<i>Lewisia brachycalyx</i> Short-sepaled lewisia	Perennial herb; wet meadows, mesic forest openings, about 4,500-7,600 ft. elev.; San Bernardino Mtns to Baja Calif, Utah, New Mexico	May - June	Fed: none Calif: S3.2 CNPS: List 2.2	Low-Moderate (marginal habitat)
<i>Lilium parryi</i> Lemon lily	Bulb; meadows and streambanks, about 4,200 – 8,600 ft. elev.; mtns of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B.2	Low (marginal habitat)
<i>Linanthus killipii</i> Baldwin Lake Linanthus	Annual; pebble plains, alkaline meadows, forest openings, about 5,500-7,900 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.1 CNPS: List 1B.2	High (suitable habitat occurs)
<i>Mimulus exiguus</i> San Bernardino Mountain monkeyflower	Annual; open, seasonally moist meadows, seeps, drainages; about 5,900 – 7,600 ft. elev.; San Bernardino Mtns. and high mtns of Baja Calif.	June - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
<i>Mimulus purpureus</i> Purple monkeyflower	Annual; meadow edges, forests, drainages, seeps, about 6,200 – 7,600 ft. elev.; San Bernardino Mtns and high mtns of Baja Calif.	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
<i>Navarretia peninsularis</i> Baja navarretia	Annual herb; open, seasonally wet places in coniferous forests; about 4,900 -7,600 ft. elev.; mtns of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low (small patches of marginal habitat)
<i>Oxytheca canrophyloides</i> Chickweed oxytheca	Annual; sandy soils in conifer forests, 3,900-8,500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mtns	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Perideridia parishii</i> ssp. <i>parishii</i> Parish's yampah	Perennial herb; meadows, moist areas in conifer forest; about 4,800 – 9,900 ft. elev.; San Bernardino Mtns and (disjunct) AZ, Nevada, New Mexico	June - August	Fed: none Calif: S2.2? CNPS: List 2.2	Low - moderate (marginal habitat)



**Appendix 2: Special Status Species Potentially Occurring on the Project Site**

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Phacelia exilis</i> ( <i>P. mohavensis</i> var. <i>exilis</i> ) Transverse Range phacelia	Annual; sandy or gravelly soils, forest openings, meadows, pebble plains, about 3,600 – 8,900 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Phacelia mohavensis</i> Mojave phacelia	Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest, about 4,500-8,100 ft. elev.; San Gabriel & San Bernardino Mtns.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Phlox dolichantha</i> Bear Valley phlox	Perennial herb; montane forest and pebble plains; about 6,000 – 9,800 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
<i>Poa atropurpurea</i> San Bernardino bluegrass	Open, flat meadows, about 6,700 – 7,500 ft. elev. in the San Bernardino; endemic to San Bernardino Mtns and San Diego Co. (Palomar and Laguna Mtns where it ranges down to about 4,400 ft. elev.)	May - June	Fed: END Calif: S2.2 CNPS: List 1B.2	Low (habitat marginal at best)
<i>Potentilla glandulosa</i> ssp. <i>ewanii</i> Ewan's cinquefoil	Perennial herb; mesic conifer forest, about 6,200-7,900 ft. elev.; nearly endemic to San Gabriel Mtns, but also reported from Fawnskin area, San Bernardino Mtns.	June - July	Fed: none Calif: S 1.3 CNPS List 1B.3	Low (field survey)
<i>Pyrocoma uniflora</i> ssp. <i>gossypina</i> ( <i>Haplopappus uniflorus</i> ssp. <i>gossypinus</i> ) Bear Valley pyrocoma	Perennial herb; meadows (usually alkaline), pebble plains, about 5,200 – 7,600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low - moderate (marginally suitable habitat occurs)
<i>Rupertia rigida</i> ( <i>Psoralea rigida</i> ) Parish's rupertia	Perennial herb; chaparral, forests, and woodlands, about 2,300-8,200 ft. elev.; San Bernardino Mtns, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Selaginella asprella</i> Bluish spike-moss	Herb; rocks, crevices, & rocky soils, dry sites in conifer forests, about 5,200-8,800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4.3	Low (marginal habitat)
<i>Senecio bernardinus</i> ( <i>Packera bernardina</i> ) San Bernardino butterweed	Perennial herb; dry meadows (incl. alkaline), about 5,900-7,600 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	Low (marginally suitable habitat)

**Appendix 2: Special Status Species Potentially Occurring on the Project Site**

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Senecio ionophyllus</i> Tehachapi ragwort	Perennial herb; crevices; rocky places in dry conifer forest; about 4,800-8,900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Moderate (suitable habitat)
<i>Sidalcea hickmani</i> ssp. <i>parishii</i> Parish's checkerbloom	Perennial herb; chaparral, oak shrubland or woodland, pine forest; San Bernardino Mtns. and a few Santa Barbara Co. sites, about 3,200 – 6,000 ft. elev.	June - August	Fed: none CA: Rare S 1.2 CNPS: List 1B.2	Minimal (marginal habitat, above elev. range)
<i>Sidalcea pedata</i> Bird's foot checkerbloom	Perennial herb; meadows (freshwater or alkaline clay), sometimes streambanks, about 5,200-8,200 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: END Calif: END, 1.1 CNPS: List 1B.1	Low (habitat marginal at best)
<i>Sphenopholis obtusata</i> Prairie wedge grass	Perennial grass; riparian woodlands, meadows, streambanks; about 1,000 – 6,600 ft. elev.; few scattered locns in Calif. but widespread in N America	April - July	Fed: none Calif: S2.2 CNPS: List 2.2	Low (upper margin elev. range; poor habitat)
<i>Streptanthus bernardinus</i> Laguna Mountains jewelflower	Perennial herb; chaparral, hardwood & conifer forest; about 3,900-8,100 ft. elev.; mtns of S Calif. (gen. W half of San Bernardino Mtns)	June - July	Fed: none Calif: S 3.3 CNPS: List 4.3	Moderate (margin of geogr. range)
<i>Streptanthus campestris</i> Southern jewelflower	Perennial herb; shrublands, forests, woodlands, often rocky sites, about 2,900 -7,600 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S 2.3 CNPS: List 1B.3	High (suitable habitat occurs)
<i>Swerria neglecta</i> ( <i>Frasera neglecta</i> ) Pine green-gentian	Perennial herb; conifer forests and piñon woodland, about 4,600-8,200 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Taraxacum californicum</i> California dandelion	Perennial herb; wet meadows, about 5,300 – 9,200 ft. elev.; San Bernardino Mtns endemic	May - Aug	Fed: END Calif: S2.1 CNPS: List 1B.2	Low - moderate (suitable habitat occurs)
<i>Thelypodium stenopetalum</i> Slender-petaled thelypodium	Perennial herb; meadows (mesic, usually alkaline clay), about 5,200 – 8,200 ft. elev.; endemic to Big Bear and Holcomb Valleys	May - Aug	Fed: END Calif: END, 1.1 CNPS: List 1B.1	Minimal (no alkaline meadow habitat)
<i>Trichostema micranthum</i> Small-flowered bluecurls	Annual; dry margins of lakes, meadows, and streams, 5,000-7,600 ft. elev., San Bernardino Mtns and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)

**Appendix 2: Special Status Species Potentially Occurring on the Project Site**

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Viola pinetorum</i> ssp. <i>grisea</i> Grey-leaved violet	Perennial herb; montane forests, about 4,900 -11,200 ft. elev.; S Sierra Nevada and reported San Bernardino Mtns (CNPS but no other source)	April - July	Fed: none Calif: S 1.3 CNPS: List 1B.3	Low (suitable habitat occurs; may be outside geogr. range)

General references: CDFG 2007a, 2007b; CNPS 2007; Hickman (ed.) 1993; Munz 1974; Sanders et al. 1995; Tibor 2001, US Fish and Wildlife Service 2006.

## **Appendix 3: Species List**

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	Common Name	Frequency/Location	Voucher #
<b>CUPRESSACEAE</b>	<b>CYPRESS FAMILY</b>		
<i>Calocedrus decurrens</i>	Incense cedar	Occas. / forest	
<i>Juniperus occidentalis</i>	Western juniper	Comm. / forest	
<b>PINACEAE</b>	<b>PINE FAMILY</b>		
<i>Abies concolor</i>	White fir	Occas. / forest	
<i>Pinus jeffreyi</i>	Jeffrey pine	Comm. / forest	
<i>Pinus monophylla</i>	Pinyon pine	Occas. / forest	
<b>APIACEAE</b>	<b>CELERY FAMILY</b>		
<i>Lomatium nevadense</i>	Nevada lomatium	Uncomm. / forest	11669
<i>Tauschia parishii</i>	Parish tauschia	Scarce / open places	11668
<b>ASTERACEAE</b>	<b>ASTER FAMILY</b>		
<i>Achillea millefolium</i>	California yarrow	Comm. / esp. mesic sites	
<i>Agoseris retrorsa</i>	Spear-leaved agoseris	Occas. / throughout	
<i>Antennaria dimorpha</i>	Low everlasting	Comm. / pebble plains	
<i>Artemisia dracunculus</i>	Tarragon	Occas. / esp. near road, lakeshore	
<i>Artemisia ludoviciana</i>	Western mugwort	Occas. / open places, washes	
<i>Artemisia tridentata</i>	Great Basin sagebrush	Comm. / open forest	
<i>Aster frondosus</i>	Short-rayed alkali aster	Occas.-comm. / near shore	
<i>Chrysothamnus nauseosus</i>	Common rabbitbrush	Occas. / throughout	
<i>Chrysothamnus viscidiflorus</i>	Curlleaf rabbitbrush	Occas.-comm. / throughout	
<i>Cirsium occidentale var. californicum</i>	California thistle	Uncomm. / open sites	
* <i>Cirsium vulgare</i>	Bull thistle	Occas. / near shore	
<i>Erigeron breweri</i>	Brewer's daisy	Occas. / forest	
<i>Erigeron divergens</i>	Diffuse daisy	Comm. / gen. open places	11667
<i>Eriophyllum confertiflorum</i>	Golden yarrow	Comm. / ± throughout	
<i>Gnaphalium canescens</i>	Perennial cudweed	Uncomm. / gen. open places	
* <i>Gnaphalium luteo-album</i>	Pearly everlasting	Occas. / roadside, shoreline	
<i>Hymenopappus filifolius</i>	Columbia cutleaf	Uncomm. / open forest	
* <i>Lactuca serriola</i>	Prickly lettuce	Occas. / mostly roadside	
<i>Lessingia filaginifolia (Corethrogyne filaginifolia)</i>	Chaparral aster	Occas. / open forest	
<i>Madia elegans</i>	Elegant tarplant	Occas. / forest	
* <i>Senecio vulgaris</i>	Common groundsel	Uncomm. / gen. roadside	
<i>Solidago californica</i>	California goldenrod	Occas. / mesic sites	
* <i>Sonchus oleraceus</i>	Common sow thistle	Occas. / near shore	

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	Common Name	Frequency/Location	Voucher #
* <i>Taraxacum officinale</i>	Common dandelion	Occas. / roadside, shoreline	
<i>Tetradymia comosa</i>	Hairy horsebrush	Occas. / open forest	
* <i>Tragopogon dubius</i>	Oyster plant, salsify	Occas. / roadside, forest	
<b>BORAGINACEAE</b>	<b>BORAGE FAMILY</b>		
<i>Cryptantha micrantha</i>	Purple root cryptantha	Occas. / open places	
<i>Cryptantha simulans</i>	Popcorn flower	Scarce / open places	11670
<b>BRASSICACEAE</b>	<b>MUSTARD FAMILY</b>		
<i>Arabis holboellii</i> (?)	Holboell's rock-cress	Occas. / open forest	
** <i>Arabis parishii</i>	Parish's rock-cress	Occas. / pebble plains	11665
<i>Caulanthus major</i>	Slender wild-cabbage	Occas. / forest	
<i>Descurainia incisa</i> ( <i>D. richardsonii</i> )	Mountain tansy mustard	Uncomm. / near road	
<i>Descurainia pinnata</i>	Tansy mustard	Occas. / mostly open forest	
<i>Erysimum capitatum</i>	Douglas wallflower	Occas. / ±throughout	
* <i>Lepidium virginicum</i> v. <i>pubescens</i>	Wild peppergrass	Occas. / mostly roadside, shoreline	
* <i>Sisymbrium altissimum</i>	Tumble mustard	Occas. / roadside	
<b>CACTACEAE</b>	<b>CACTUS FAMILY</b>		
<i>Opuntia basilaris</i> var. <i>basilaris</i>	Common beavertail cactus	Uncomm. / open forest	
<b>CAPRIFOLIACEAE</b>	<b>HONEYSUCKLE FAMILY</b>		
<i>Symphoricarpos rotundifolius</i> var. <i>parishii</i>	Parish snowberry	Occas. / shaded forest	
<b>CARYOPHYLLACEAE</b>	<b>CARNATION FAMILY</b>		
<i>Silene verecunda</i> ssp. <i>platyota</i>	Cuyamaca campion	Occas. / forest	
<b>CHENOPODIACEAE</b>	<b>GOOSEFOOT FAMILY</b>		
* <i>Chenopodium album</i> (?)	Common goosefoot	Occas. / throughout	
* <i>Salsola tragus</i>	Russian thistle, tumbleweed	Occas. / mostly roadside	
<b>CONVOLVULACEAE</b>	<b>MORNING GLORY FAMILY</b>		
<i>Calystegia malacophylla</i> ssp. <i>fulcrata</i> ( <i>C. fulcrata</i> )	Morning glory	Occas. / throughout	
<b>ERICACEAE</b>	<b>MANZANITA FAMILY</b>		
<i>Arctostaphylos patula</i>	Greenleaf manzanita	Occas.-comm. / forest	
<b>EUPHORBIACEAE</b>	<b>SPURGE FAMILY</b>		
<i>Chamaesyce albomarginata</i>	Rattlesnake spurge	Occas. / open forest	
<i>Euphorbia palmeri</i>	Wood spurge	Occas. / uplands	
<b>FABACEAE</b>	<b>PEA FAMILY</b>		
<i>Amorpha californica</i>	California false indigo	Occas. / mesic forest	
** <i>Astragalus leucolobus</i>	Bear Valley woollypod	Comm. / pebble plains	11705
<i>Astragalus douglasii</i>	Douglas rattleweed	Uncomm. / open places	

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	Common Name	Frequency/Location	Voucher #
<i>Lotus argyraeus</i>	Silver lotus	Occas. / open forest	
<i>Lotus nevadensis</i>	Nevada lotus	Comm. / open places	
<i>Lupinus cf. breweri</i>	Silver mat lupine	Comm. / pebble plains, etc.	
<i>Lupinus excubitus</i> var. <i>austromontanus</i>	Southern mountain lupine	Occas. / ± throughout	11666
<i>Lupinus lepidus</i> v. <i>confertus</i>	Prairie lupine	Occas. / lakeshore	
* <i>Medicago lupulina</i>	Black medick	Uncomm. / near lakeshore	
* <i>Melilotus alba</i>	White sweet-clover	Occas.-comm. / roadsides, shore	
<b>FAGACEAE</b>	<b>OAK FAMILY</b>		
<i>Quercus kelloggii</i>	California black oak	Comm. / forest	
<b>GERANIACEAE</b>	<b>GERANIUM FAMILY</b>		
* <i>Erodium cicutarium</i>	Red-stemmed filaree	Occas.-comm. / roadsides, etc.	
<b>HYDROPHYLLACEAE</b>	<b>WATERLEAF FAMILY</b>		
<i>Eridictyon trichocalyx</i>	Yerba santa	Occas. / open forest	
<i>Phacelia distans</i> (?)	Common phacelia	Uncomm. / open forest	
<i>Phacelia imbricata</i>	Broad-sepaled phacelia	Uncomm. / open forest	
<b>LAMIACEAE</b>	<b>MINT FAMILY</b>		
<i>Monardella linoides</i> (?) (or <i>M. odoratissima</i> )	Flax-leaved monardella	Occas. / forest	
<i>Scutellaria siphocampyloides</i> ( <i>S. austinae</i> )	Austin's skullcap	Uncomm. / mesic forest	
<b>LOASACEAE</b>	<b>STICK-LEAF FAMILY</b>		
<i>Mentzelia</i> sp.	Unid. stick-leaf	Uncomm. / uplands	11674
<b>MALVACEAE</b>	<b>MALLOW FAMILY</b>		
* <i>Malva parviflora</i>	Cheeseweed	Occas. / mostly lakeshore	
<b>ONAGRACEAE</b>	<b>EVENING PRIMROSE FAMILY</b>		
<i>Clarkia</i> sp.	Unid. annual clarkia	Uncomm. / shaded forest	
<i>Epilobium brachycarpum</i> ( <i>E. paniculatum</i> )	Summer cottonweed	Occas.-comm. upland margins	
<i>Epilobium ciliatum</i>	Willow-herb	Occas. / mostly lakeshore	
<i>Gaypohytum</i> sp.	Unid. gayophytum	Comm. / open forest	
<b>POLEMONIACEAE</b>	<b>PHLOX FAMILY</b>		
<i>Gilia latiflora</i> (?)	Broad-flowered gilia	Uncomm. / open forest	
<i>Gilia modocensis</i>	Modoc gilia	Occas. / open places	11659
<i>Eriastrum densifolium</i> ssp. <i>densifolium</i>	Mojave woolly-star	Occas. / open forest	
<i>Eriastrum sapphirinum</i>	Sapphire woollystar	Occas. / open forest	
<i>Linanthus breviculus</i>	Mojave linanthus	Comm. / open forest	
<i>Phlox gracilis</i>	Slender phlox	Comm. / open places	11660

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	Common Name	Frequency/Location	Voucher #
<b>POLYGONACEAE</b>	<b>BUCKWHEAT FAMILY</b>		
<i>Eriogonum davidsonii</i> (=E. <i>molestum</i> var. <i>davidsonii</i> )	Davidson buckwheat	Occas. / open forest	
<i>Eriogonum wrightii</i> ssp. <i>subscaposum</i>	Wright's buckwheat	Comm. & characteristic / pebble plains	
<i>Eriogonum umbellatum</i> v. <i>munzii</i>	Munz sulfur buckwheat	Occas. / open forest	
* <i>Polygonum arenastrum</i>	Common knotweed	Occas. / roadside, lake shore	
* <i>Rumex crispus</i>	Curly dock	Occas. / mostly lakeshore	
<i>Rumex salicifolius</i>	Willow dock	Uncomm. / near lakeshore	
<b>PORTULACACEAE</b>	<b>PURSLANE FAMILY</b>		
<i>Lewisia rediviva</i>	Bitter root	Occas.-comm. / pebble plains	
<b>RANUNCULACEAE</b>	<b>BUTTERCUP FAMILY</b>		
<i>Delphinium parishii</i> (?)	Parish larkspur	Occas. / forest	
* <i>Ranunculus sceleratus</i>	Cursed buttercup	Occas. / lakeshore	11656
<b>RHAMNACEAE</b>	<b>BUCKTHORN FAMILY</b>		
<i>Ceanothus cordulatus</i>	Mountain whitethorn	Occas. / open forest	
<i>Ceanothus greggii</i>	Cupleaf ceanothus	Uncomm. / open forest	
<i>Ceanothus integerrimus</i>	Deerbrush	Occas. / forest	
<b>ROSACEAE</b>	<b>ROSE FAMILY</b>		
<i>Amelanchier utahensis</i>	Service berry	Comm. / ± throughout	
<i>Cercocarpus betuloides</i>	Birch-leaf mountain mahogany	Uncomm.	
<i>Cercocarpus ledifolius</i>	Curleaf mountain mahogany	Comm. / ± throughout	
<i>Horkelia rydbergii</i> ( <i>H. bolanderi</i> s. <i>parryi</i> )	Transverse range horkelia	Occas. / mostly near lake	
** <i>Ivesia argyrocoma</i>	Silver-haired ivesia	locally comm. / pebble pl.	11658
<i>Potentilla anserina</i>	Silverweed	Comm. / lakeshore	
<i>Potentilla biennis</i>	Biennial cinquefoil	Comm. / lakeshore	11671
<i>Potentilla gracilis</i>	Slender cinquefoil	Occas. / mesic places	
<i>Potentilla wheeleri</i>	Wheeler cinquefoil	Scarce / near lakeshore	11673
<b>RUBIACEAE</b>	<b>COFFEE FAMILY</b>		
* <i>Galium aparine</i>	Goose grass	Uncomm. / shaded forest	
<i>Galium parishii</i>	Parish bedstraw	Occas. / forest	
<b>SALICACEAE</b>	<b>WILLOW FAMILY</b>		
<i>Populus balsamifera trichocarpa</i>	Black cottonwood	Seedlings only / lakeshore	
<i>Salix laevigata</i> (?)	Red willow	Uncomm. / lakeshore	
<i>Salix lasiolepis</i> (?)	Arroyo willow	Comm. / lakeshore	



### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	Common Name	Frequency/Location	Voucher #
<b>SCROPHULARIACEAE</b>			
<b>SNAPDRAGON FAMILY</b>			
** <i>Castilleja cinera</i>	Ash-gray paintbrush	Localized / pebble plains	11657
** <i>Castilleja montigena</i> ( <i>C. applegatei</i> ssp. <i>martinii</i> )	Heckerd's paintbrush	Occas. / forest	
<i>Collinsia parviflora</i>	Small-flowered blue-eyed Mary	Comm., patchy / peb. pl.	11661
<i>Limosella acaulis</i>	Mudwort	Comm.-abund. / wet lakeshore	11655
<i>Mimulus guttatus</i>	Seep monkeyflower	Occas. / lakeshore	
<i>Pedicularis semibarbata</i>	Pine-woods lousewort	Occas. / forest	11664
<i>Penstemon eatonii</i>	Eaton firecracker	Occas. / forest	
* <i>Verbascum thapsus</i>	Common muellin	Occas. / throughout	
<b>SOLANACEAE</b>			
<b>NIGHTSHADE FAMILY</b>			
<i>Solanum xanti</i>	Chaparral nightshade	Uncomm. / forest	
<b>STERCULIACEAE</b>			
<b>CACAO FAMILY</b>			
<i>Fremontodendron californicum</i>	Flannel bush	Occas.-comm. / open forest	
<b>TAMARICACEAE</b>			
<b>TAMARISK FAMILY</b>			
<i>Tamarix ramosissima</i>	Mediterranean tamarisk	Occas. / lakeshore	
<b>URTICACEAE</b>			
<b>NETTLE FAMILY</b>			
<i>Urtica dioica</i> ssp. <i>holosericea</i>	Stinging nettle	Occas. / lakeshore	
<b>VIOLACEAE</b>			
<b>VIOLET FAMILY</b>			
<i>Viola douglasii</i>	Douglas violet	Occas. / pebble plains	11663
<i>Viola purpurea</i>	Mountain violet	Occas. / throughout	11662
<b>VISCAEAE</b>			
<b>MISTLETOE FAMILY</b>			
<i>Arceuthobium campylopodum</i>	Dwarf mistletoe	Uncomm. / on yellow pines	
<b>CYPERACEAE</b>			
<b>SEDGE FAMILY</b>			
<i>Carex athrostachya</i>	Slender-beaked sedge	Occas. / near lake	
<i>Carex</i> sp.	Unid. sedge	Uncomm. / near lakeshore	11671
<b>JUNCACEAE</b>			
<b>RUSH FAMILY</b>			
<i>Juncus arcticus</i> (incl. vars. <i>balticus</i> and <i>mexicanus</i> )	Wire-grass	Occas.-comm. / mesic areas	
<b>LILIACEAE</b>			
<b>LILY FAMILY</b>			
<i>Allium parryi</i>	Parry's onion	Occas. / mostly pebble plains	
<i>Calochortus kennedyi</i>	Kennedy's mariposa lily	Uncomm. / open forest	
<b>POACEAE</b>			
<b>GRASS FAMILY</b>			
<i>Agrostis</i> sp.	Unid. bentgrass	Occas. / lakeshore	
<i>Alopecurus aequalis</i>	Short-awn foxtail	Comm., patchy / near shore	
<i>Bromus carinatus</i>	California brome	Occas. / uplands, ±throughout	

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	Common Name	Frequency/Location	Voucher #
<i>Bromus orcuttianus</i> (?)	Orcutt brome	Uncomm. / mesic forest	
* <i>Bromus tectorum</i>	Cheat grass	Comm. / ± throughout	
<i>Elymus elymoides</i> ( <i>Sitanion hystrix</i> v. <i>hystrix</i> )	Bottlebrush squirreltail	Occas. / ± throughout	
<i>Elymus glaucus</i>	Blue wild-rye	Occas. / ± throughout	
<i>Hordeum jubatum</i>	Foxtail barley	Uncomm. / mostly near lake	
* <i>Koeleria macrantha</i>	Junegrass	Occas. / mesic forest, uplands	
<i>Melica stricta</i>	Nodding melic	Uncomm. patchy, uplands	
<i>Muhlenbergia rigens</i>	Deergrass	Occas. / throughout	
<i>Poa fendleriana</i>	Fendler bluegrass	Occas.-comm. / forest	
<i>Poa secunda</i>	Nodding bluegrass	Comm. / ± throughout	
* <i>Polypogon monspeliensis</i>	Rabbitfoot grass	Occas.-comm. / near shore	
<i>Pucinellia nuttalliana</i>	Alkali grass	Uncomm. / low-lying mesic site	
<i>Stipa coronata</i> ssp. <i>depauperata</i> ( <i>Achnatherum parishii</i> )	Parish needlegrass	Occas. / mostly open forest	
<i>Stipa lettermannii</i>	Letterman's needlegrass	Occas. / forest	
<i>Vulpia microstachys</i> ( <i>Festuca microstachys</i> , <i>F. reflexa</i> , <i>F. pacifica</i> , <i>F. confusa</i> )	Annual fescue	Uncomm. patchy / upland	
<p>Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season.</p> <p>Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), Munz (1974), and other regional references. Taxonomy and nomenclature generally follow Hickman.</p> <p>Some plants were collected as vouchers (see collection numbers at right) and will be donated to the Herbaria at Rancho Santa Ana Botanic Garden or UC Riverside.</p>			

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<b>AMPHIBIA</b>	
<b>SALAMANDRIDAE</b>	<b>NEWT</b>
<i>Taricha torosa</i>	California newt
<b>PLETHODONTIDAE</b>	<b>LUNGLESS SALAMANDERS</b>
<i>Ensatina eschscholtzii</i>	Ensatina
<i>Aneides lugubris</i>	Arboreal salamander
<i>Batrachoseps pacificus</i>	Pacific slender salamander
<b>PELOBATIDAE</b>	<b>SPADEFoot TOADS</b>
** <i>Scaphiopus hammondi</i>	Western spadefoot
<b>BUFONIDAE</b>	<b>TRUE TOADS</b>
<i>Bufo boreas</i>	Western toad
<i>Bufo woodhousei</i>	Woodhouse toad
** <i>Bufo microscaphus</i>	Southwestern toad
<i>Bufo punctatus</i>	Red-spotted toad
<b>HYLIDAE</b>	<b>TREEFROGS</b>
<i>Hyla cadaverina</i>	California treefrog
<i>Hyla regilla</i>	Pacific treefrog
<b>RANIDAE</b>	<b>TRUE FROGS</b>
** <i>Rana aurora</i>	Red-legged frog
** <i>Rana pipiens</i>	Northern leopard frog
* <i>Rana catesbeiana</i>	Bullfrog
<b>REPTILIA</b>	
<b>EMYDIDAE</b>	<b>BOX AND WATER TURTLES</b>
** <i>Clemmys marmorata</i>	Western pond turtle
<b>TESTUDINIDAE</b>	<b>LAND TORTOISES</b>
** <i>Gopherus agassizii (Xerobates agassizi)</i>	Desert tortoise
<b>TRIONYCHIDAE</b>	<b>SOFTSHELL TURTLES</b>
<i>Trionyx spiniferus</i>	Spiny softshell
<b>GEKKONIDAE</b>	<b>GECKOS</b>
<i>Coleonyx variegatus</i>	Western banded gecko
** <i>Coleonyx swainsoni</i>	Barefoot gecko
<i>Phyllodactylus xanti</i>	Leaf-toed gecko
<b>IGUANIDAE</b>	<b>IGUANID LIZARDS</b>
<i>Dipsosaurus dorsalis</i>	Desert iguana
<i>Sauromalus obesus</i>	Common chuckwalla
<i>Callisaurus draconoides</i>	Zebra-tailed lizard
** <i>Uma notata ssp. notata</i>	Colorado desert fringe-toed lizard
** <i>Uma inornata</i>	Coachella valley fringe-toed lizard
** <i>Uma scoparia</i>	Mojave fringe-toed lizard
<i>Crotaphytus insularis</i>	Desert collared lizard
<i>Gambelia wislizenii</i>	Long-nosed leopard lizard

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Sceloporus magister</i>	Desert spiny lizard
<i>Sceloporus orcutti</i>	Granite spiny lizard
<i>Sceloporus occidentalis</i>	Western fence lizard
<i>Sceloporus graciosus</i>	Sagebrush lizard
<i>Uta stansburiana</i>	Side-blotched lizard
<i>Urosaurus graciosus</i>	Long-tailed brush lizard
<i>Petrosaurus mearnsi</i>	Banded rock lizard
** <i>Phrynosoma coronatum ssp. blainvillei</i>	San Diego horned lizard
<i>Phrynosoma platyrhinos</i>	Desert horned lizard
** <i>Phrynosoma mcallii</i>	Flat-tailed horned lizard
<b>XANTUSIIDAE</b>	<b>NIGHT LIZARDS</b>
<i>Xantusia henshawi</i>	Granite night lizard
<i>Xantusia vigilis</i>	Desert night lizard
<b>SCINCIDAE</b>	<b>SKINKS</b>
<i>Eumeces skiltonianus</i>	Western skink
<i>Eumeces gilberti</i>	Gilbert skink
<b>TEIIDAE</b>	<b>WHIPTAILS</b>
** <i>Cnemidophorus hyperythrus</i>	Orange-throated whiptail
** <i>Cnemidophorus tigris</i>	Western whiptail
<b>ANGUIDAE</b>	<b>ALLIGATOR LIZARDS</b>
<i>Gerrhonotus multicarinatus</i>	Southern alligator lizard
<b>ANNIELLIDAE</b>	<b>LEGLESS LIZARDS</b>
** <i>Aniella pulchra ssp. pulchra</i>	Silvery legless lizard
<b>LEPTOTYPHLOPIDAE</b>	<b>SLENDER BLIND SNAKES</b>
<i>Leptotyphlops humilis</i>	Western blind snake
<b>BOIDAE</b>	<b>BOAS AND PYTHONS</b>
** <i>Charina bottae ssp. umbratica</i>	Southern rubber boa
<i>Lichanura trivirgata</i>	Rosy boa
<b>COLUBRIDAE</b>	<b>COLUBRIDS</b>
** <i>Diadophis punctatus</i>	Ringneck snake
<i>Phyllorhynchus decurtatus</i>	Spotted leaf-nosed snake
<i>Coluber constrictor</i>	Racer
<i>Masticophis flagellum</i>	Coachwhip
<i>Masticophis lateralis</i>	California whipsnake
** <i>Salvadora hexalepis</i>	Western patch-nosed snake
<i>Arizona elegans</i>	Glossy snake
<i>Pituophis melanoleucus</i>	Gopher snake
<i>Lampropeltis getulus</i>	Common kingsnake
** <i>Lampropeltis zonata ssp. pulchra</i>	San Bernardino Mountain kingsnake
<i>Rhinocheilus lecontei</i>	Long-nosed snake
<i>Thamnophis sirtalis</i>	Common garter snake
<i>Thamnophis elegans</i>	Western terrestrial garter snake

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
** <i>Thamnophis hammondi</i>	Two-striped garter snake
<b>VIPERIDAE</b>	<b>VIPERS</b>
<i>Crotalus atrox</i>	Western diamondback rattlesnake
** <i>Crotalus ruber</i>	Red diamond rattlesnake
<i>Crotalus mitchellii</i>	Speckled rattlesnake
<i>Crotalus cerastes</i>	Sidewinder
<i>Crotalus viridis</i>	Western rattlesnake
<i>Crotalus scutulatus</i>	Mojave rattlesnake
<b>AVES</b>	<b>BIRDS</b>
<b>GAVIIDAE</b>	<b>LOONS</b>
<i>Gavia immer</i>	Common loon
<b>PODICIPEDIDAE</b>	<b>GREBES</b>
<i>Podilymbus podiceps</i>	Pied-billed grebe
<i>Podiceps nigricollis</i>	Eared grebe
<i>Aechmophorus occidentalis</i>	Western grebe
<i>Aechmophorus clarkii</i>	Clark's grebe
<b>PELECANIDAE</b>	<b>PELICANS</b>
<i>Pelecanus erythrorhynchos</i>	American white pelican
** <i>Pelecanus occidentalis</i>	Brown pelican
<b>PHALACROCORACIDAE</b>	<b>CORMORANTS</b>
<i>Phalacrocorax auritus</i>	Double-crested cormorant
<b>ARDEIDAE</b>	<b>HERONS</b>
<i>Botaurus lentiginosus</i>	American bittern
<i>Ardea herodias</i>	Great blue heron
<i>Casmerodius albus</i>	Great egret
<i>Egretta thula</i>	Snowy egret
<i>Bubulcus ibis</i>	Cattle egret
<i>Butorides striatus</i>	Green-backed heron
** <i>Nycticorax nycticorax</i>	Black-crowned night heron
<b>THRESKIORNITHIDAE</b>	<b>IBISES AND SPOONBILLS</b>
** <i>Plegadis chihi</i>	White-faced ibis
<b>ANATIDAE</b>	<b>DUCKS, GEESE AND SWANS</b>
<i>Anser albifrons</i>	Greater white-fronted goose
<i>Chen caerulescens</i>	Snow goose
<i>Chen rossii</i>	Ross' goose
<i>Branta canadensis</i>	Canada goose
<i>Anas crecca</i>	Green-winged teal
<i>Anas platyrhynchos</i>	Mallard
<i>Anas acuta</i>	Northern pintail
<i>Anas discors</i>	Blue-winged teal
<i>Anas cyanoptera</i>	Cinnamon teal
<i>Anas clypeata</i>	Northern shoveler

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Anas strepera</i>	Gadwall
<i>Anas americana</i>	American wigeon
<i>Aythya valisineria</i>	Canvasback
<i>Aythya americana</i>	Redhead
<i>Aythya collaris</i>	Ring-necked duck
<i>Aythya affinis</i>	Lesser scaup
<i>Bucephala clangula</i>	Common goldeneye
<i>Bucephala albeola</i>	Bufflehead
<i>Mergus merganser</i>	Common merganser
<i>Mergus serrator</i>	Red-breasted merganser
<i>Oxyura jamaicensis</i>	Ruddy duck
<b>RALLIDAE</b>	<b>RAILS, GALLINULES, COOTS</b>
<i>Rallus longirostris</i>	Clapper rail
<i>Rallus limicola</i>	Virginia rail
<i>Porzana carolina</i>	Sora
<i>Gallinula chloropus</i>	Common moorhen
<i>Fulica americana</i>	American coot
<b>CATHARTIDAE</b>	<b>VULTURES</b>
<i>Cathartes aura</i>	Turkey vulture
<b>ACCIPITRIDAE</b>	<b>HAWKS, EAGLES, HARRIERS</b>
** <i>Pandion haliaetus</i>	Osprey
** <i>Elanus caeruleus</i>	Black-shouldered kite
** <i>Aquila chrysaetos</i>	Golden eagle
** <i>Haliaeetus leucocephalus</i>	Bald eagle
** <i>Circus cyaneus</i>	Northern harrier
** <i>Accipiter striatus</i>	Sharp-shinned hawk
** <i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo lineatus</i>	Red-shouldered hawk
** <i>Buteo swainsoni</i>	Swainson's hawk
<i>Buteo jamaicensis</i>	Red-tailed hawk
** <i>Buteo regalis</i>	Ferruginous hawk
<i>Buteo lagopus</i>	Rough-legged hawk
<b>FALCONIDAE</b>	<b>FALCONS</b>
<i>Falco sparverius</i>	American kestrel
** <i>Falco columbarius</i>	Merlin
** <i>Falco peregrinus</i>	Peregrine falcon
** <i>Falco mexicanus</i>	Prairie falcon
<b>PHASIANIDAE</b>	<b>GROUSE AND QUAIL</b>
<i>Alectoris chukar</i>	Chukar
<i>Phasianus colchicus</i>	Ring-necked pheasant
<i>Callipepla gambelii</i>	Gambel's quail
<i>Callipepla californica</i>	California quail

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Oreortyx pictus</i>	Mountain quail
<b>CHARADRIIDAE</b>	<b>PLOVERS</b>
<i>Phuvalis squatarola</i>	Black-bellied plover
** <i>Charadrius alexandrinus</i>	Snowy plover
<i>Charadrius semipalmatus</i>	Semipalmated plover
<i>Charadrius vociferus</i>	Killdeer
** <i>Charadrius montanus</i>	Mountain plover
<b>RECURVIROSTRIDAE</b>	<b>STILTS AND AVOCETS</b>
<i>Himantopus mexicanus</i>	Black-necked stilt
<i>Recurvirostra americana</i>	American avocet
<b>SCOLOPACIDAE</b>	<b>SANDPIPERS</b>
<i>Tringa melanoleuca</i>	Greater yellowlegs
<i>Tringa flavipes</i>	Lesser yellowlegs
<i>Catoptrophorus semipalmatus</i>	Willet
<i>Actitis macularia</i>	Spotted sandpiper
<i>Numenius phaeopus</i>	Whimbrel
<i>Numenius americanus</i>	Long-billed curlew
<i>Limosa fedoa</i>	Marbled godwit
<i>Arenaria interpres</i>	Ruddy turnstone
<i>Arenaria melanocephala</i>	Black turnstone
<i>Calidris canutus</i>	Red knot
<i>Calidris alba</i>	Sanderling
<i>Calidris pusilla</i>	Semipalmated sandpiper
<i>Calidris mauri</i>	Western sandpiper
<i>Calidris minutilla</i>	Least sandpiper
<i>Calidris alpina</i>	Dunlin
<i>Limnodromus griseus</i>	Short-billed dowitcher
<i>Limnodromus scolopaceus</i>	Long-billed dowitcher
<i>Gallinago gallinago</i>	Common snipe
<i>Phalaropus tricolor</i>	Wilson's phalarope
<i>Phalaropus lobatus</i>	Red-necked phalarope
<b>LARIDAE</b>	<b>GULLS AND TERNS</b>
<i>Larus philadelphia</i>	Bonaparte's gull
<i>Larus delawarensis</i>	Ring-billed gull
<i>Larus californicus</i>	California gull
<i>Larus argentatus</i>	Herring gull
<i>Larus occidentalis</i>	Western gull
<i>Sterna caspia</i>	Caspian tern
<i>Sterna hirundo</i>	Common tern
<i>Sterna forsteri</i>	Forster's tern
<b>COLUMBIDAE</b>	<b>PIGEONS AND DOVES</b>
<i>Columba livia</i>	Rock dove

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Columba fasciata</i>	Band-tailed pigeon
* <i>Streptopelia chinensis</i>	Spotted dove
<i>Zenaida asiatica</i>	White-winged dove
<i>Zenaida macroura</i>	Mourning dove
<i>Columbina passerina</i>	Common ground-dove
<b>CUCULIDAE</b>	<b>CUCKOOS</b>
<i>Geococcyx californianus</i>	Greater roadrunner
<b>TYTONIDAE</b>	<b>BARN OWLS</b>
<i>Tyto alba</i>	Common barn-owl
<b>STRIGIDAE</b>	<b>TYPICAL OWLS</b>
<i>Otus kennicottii</i>	Western screech-owl
<i>Bubo virginianus</i>	Great horned owl
** <i>Speotyto cunicularia</i>	Burrowing owl
** <i>Asio otus</i>	Long-eared owl
<b>CAMPRIMULGIDAE</b>	<b>NIGHTJARS</b>
<i>Chordeiles acutipennis</i>	Lesser nighthawk
<i>Chordeiles minor</i>	Common nighthawk
<i>Phalaenoptilus nuttallii</i>	Common poorwill
<b>APODIDAE</b>	<b>SWIFTS</b>
<i>Chaetura vauxi</i>	Vaux's swift
<i>Aeronautes saxatalis</i>	White-throated swift
<b>TROCHILIDAE</b>	<b>HUMMINGBIRDS</b>
<i>Archilochus alexandri</i>	Black-chinned hummingbird
<i>Calypte anna</i>	Anna's hummingbird
<i>Calypte costae</i>	Costa's hummingbird
<i>Selasphorus rufus</i>	Rufous hummingbird
<i>Selasphorus sasin</i>	Allen's hummingbird
<b>ALCEDINIDAE</b>	<b>KINGFISHERS</b>
<i>Ceryle alcyon</i>	Belted kingfisher
<b>PICIDAE</b>	<b>WOODPECKERS</b>
<i>Melanerpes formicivorus</i>	Acorn woodpecker
<i>Melanerpes lewis</i>	Lewis' woodpecker
<i>Sphyrapicus nuchalis</i>	Red-naped sapsucker
<i>Sphyrapicus thyroideus</i>	Williamson's sapsucker
<i>Picoides scalaris</i>	Ladder-backed woodpecker
<i>Picoides nuttallii</i>	Nuttall's woodpecker
<i>Picoides pubescens</i>	Downy woodpecker
<i>Picoides villosus</i>	Hairy woodpecker
<i>Picoides albolarvatus</i>	White-headed woodpecker
<i>Colaptes auratus</i>	Northern flicker
<b>TYRANNIDAE</b>	<b>TYRANT FLYCATCHERS</b>
<i>Contopus borealis</i>	Olive-sided flycatcher



### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Contopus sordidulus</i>	Western wood-pewee
<i>Empidonax trailii</i>	Willow flycatcher
<i>Empidonax hammondii</i>	Hammond's flycatcher
<i>Empidonax oberholseri</i>	Dusky flycatcher
<i>Empidonax wrightii</i>	Gray flycatcher
<i>Empidonax difficilis</i>	Western flycatcher
<i>Sayornis nigricans</i>	Black phoebe
<i>Sayornis saya</i>	Say's phoebe
<i>Myiarchus cinerascens</i>	Ash-throated flycatcher
<i>Tyrannus vociferans</i>	Cassin's kingbird
<i>Tyrannus verticalis</i>	Western kingbird
<b>ALAUDIDAE</b>	<b>LARKS</b>
<i>Eremophila alpestris</i>	Horned lark
<b>HIRUNDINIDAE</b>	<b>SWALLOWS</b>
<i>Tachycineta bicolor</i>	Tree swallow
<i>Tachycineta thalassina</i>	Violet-green swallow
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
<i>Hirundo pyrrhonota</i>	Cliff swallow
<i>Hirundo rustica</i>	Barn swallow
<b>CORVIDAE</b>	<b>CROWS AND JAYS</b>
<i>Cyanocitta stellari</i>	Stellar's jay
<i>Aphelocoma coerulescens</i>	Scrub jay
<i>Gymnorhinus cyanocephalus</i>	Pinyon jay
<i>Nucifraga columbiana</i>	Clark's nutcracker
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	Common raven
<b>PARIDAE</b>	<b>CHICKADEES AND TITMICE</b>
<i>Parus gambeli</i>	Mountain chickadee
<i>Parus inornatus</i>	Plain titmouse
<b>REMIZIDAE</b>	<b>VERDINS</b>
<i>Auriparus flavipes</i>	Verdin
<b>AEGITHALIDAE</b>	<b>BUSHTITS</b>
<i>Psaltriparus minimus</i>	Bushtit
<b>SITTIDAE</b>	<b>NUTHATCHES</b>
<i>Sitta canadensis</i>	Red-breasted nuthatch
<i>Sitta carolinensis</i>	White-breasted nuthatch
<i>Sitta pygmaea</i>	Pygmy nuthatch
<b>CERTHIIDAE</b>	<b>CREEPERS</b>
<i>Certhia americana</i>	Brown creeper
<b>TROGLODYTIDAE</b>	<b>WRENS</b>
<i>Campylorhynchus brunneicapillus</i>	Cactus wren
** <i>Campylorhynchus brunneicapillus</i>	Coastal cactus wren

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Salpinctes obsoletus</i>	Rock wren
<i>Catherpes mexicanus</i>	Canyon wren
<i>Thryomanes bewickii</i>	Bewick's wren
<i>Troglodytes aedon</i>	House wren
<i>Cistothorus palustris</i>	Marsh wren
<b>CINCLIDAE</b>	<b>DIPPERS</b>
<i>Cinclus mexicanus</i>	American dipper
<b>MUSCICAPIDAE</b>	<b>THRUSHES AND ALLIES</b>
<i>Ixoreus naevius</i>	Varied thrush
<i>Regulus calendula</i>	Ruby-crowned kinglet
<i>Polioptila caerulea</i>	Blue-gray gnatcatcher
** <i>Polioptila melanura</i>	Black-tailed gnatcatcher
** <i>Polioptila californica</i>	California gnatcatcher
<i>Sialia mexicana</i>	Western bluebird
<i>Sialia currucoides</i>	Mountain bluebird
<i>Myadestes townsendi</i>	Townsend's solitaire
<i>Catharus ustulatus</i>	Swainson's thrush
<i>Catharus guttatus</i>	Hermit thrush
<i>Turdus migratorius</i>	American robin
<i>Chamaea fasciata</i>	Wrentit
<b>MIMIDAE</b>	<b>MOCKINGBIRDS AND THRASHERS</b>
<i>Mimus polyglottos</i>	Northern mockingbird
<i>Oreoscoptes montanus</i>	Sage thrasher
<i>Toxostoma redivivum</i>	California thrasher
** <i>Toxostoma crissale</i>	Crissal thrasher
** <i>Toxostoma lecontei</i>	Le Conte's thrasher
<b>MOTACILLIDAE</b>	<b>WAGTAILS AND PIPITS</b>
<i>Anthus spinoletta</i>	American pipit
<b>BOMBYCILLIDAE</b>	<b>WAXWINGS</b>
<i>Bombycilla cedrorum</i>	Cedar waxwing
<b>PTILOGONATIDAE</b>	<b>SILKY FLYCATCHERS</b>
<i>Phainopepla nitens</i>	Phainopepla
<b>LANIIDAE</b>	<b>SHRIKES</b>
<i>Lanius ludovicianus</i>	Loggerhead shrike
<b>STURNIDAE</b>	<b>STARLINGS</b>
* <i>Sturnus vulgaris</i>	European starling
<b>VIREONIDAE</b>	<b>VIREOS</b>
** <i>Vireo bellii</i>	Bell's vireo
** <i>Vireo vicinior</i>	Gray vireo
<i>Vireo solitarius</i>	Solitary vireo
<i>Vireo huttoni</i>	Hutton's vireo
<i>Vireo gilvus</i>	Warbling vireo

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<b>EMBERIZIDAE</b>	<b>SPARROWS, WARBLERS, TANAGERS</b>
<i>Vermivora celata</i>	Orange-crowned warbler
<i>Vermivora ruficapilla</i>	Nashville warbler
<i>Vermivora luciae</i>	Lucy's warbler
** <i>Dendroica petechia</i>	Yellow warbler
<i>Dendroica coronata</i>	Yellow-rumped warbler
<i>Dendroica nigrescens</i>	Black-throated gray warbler
<i>Dendroica occidentalis</i>	Hermit warbler
<i>Dendroica townsendi</i>	Townsend's warbler
<i>Oporornis tolmiei</i>	MacGillivray's warbler
<i>Geothlypis trichas</i>	Common yellowthroat
<i>Wilsonia pusilla</i>	Wilson's warbler
** <i>Icteria virens</i>	Yellow-breasted chat
** <i>Piranga rubra</i>	Summer tanager
<i>Piranga ludoviciana</i>	Western tanager
<i>Pheucticus melanocephalus</i>	Black-headed grosbeak
<i>Guiraca caerulea</i>	Blue grosbeak
<i>Passerina amoena</i>	Lazuli bunting
<i>Pipilo chlorurus</i>	Green-tailed towhee
<i>Pipilo erythrophthalmus</i>	Rufous-sided towhee
<i>Pipilo crissalis</i>	California towhee
<i>Pipilo aberti</i>	Abert's towhee
<i>Aimophila ruficeps</i>	Rufous-crowned sparrow
<i>Spizella passerina</i>	Chipping sparrow
<i>Spizella breweri</i>	Brewer's sparrow
<i>Spizella atrogularis</i>	Black-chinned sparrow
<i>Pooecetes gramineus</i>	Vesper sparrow
<i>Chondestes grammacus</i>	Lark sparrow
<i>Amphispiza bilineata</i>	Black-throated sparrow
<i>Amphispiza belli</i>	Sage sparrow
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Passerella iliaca</i>	Fox sparrow
<i>Melospiza melodia</i>	Song sparrow
<i>Melospiza lincolni</i>	Lincoln's sparrow
<i>Zonotrichia atricapilla</i>	Golden-crowned sparrow
<i>Zonotrichia leucophrys</i>	White-crowned sparrow
<i>Junco hyemalis</i>	Dark-eyed junco
<i>Agelaius phoeniceus</i>	Red-winged blackbird
** <i>Agelaius tricolor</i>	Tricolored blackbird
<i>Sturnella neglecta</i>	Western meadowlark
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed blackbird

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Quiscalus mexicanus</i>	Great-tailed grackle
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Icterus cucullatus</i>	Hooded oriole
<i>Icterus galbula</i>	Northern oriole
<i>Icterus parisorum</i>	Scott's oriole
<b>FRINGILLIDAE</b>	<b>FINCHES</b>
<i>Carpodacus purpureus</i>	Purple finch
<i>Carpodacus cassinii</i>	Cassin's finch
<i>Carpodacus mexicanus</i>	House finch
<i>Carduelis pinus</i>	Pine siskin
<i>Carduelis psaltria</i>	Lesser goldfinch
<i>Carduelis lawrencei</i>	Lawrence's goldfinch
<i>Carduelis tristis</i>	American goldfinch
<b>PASSERIDAE</b>	<b>WEAVERS</b>
* <i>Passer domesticus</i>	House sparrow
<b>MAMMALIA</b>	<b>MAMMALS</b>
<b>DIDELPHIDAE</b>	<b>OPOSSUMS</b>
<i>Didelphis marsupialis</i>	Common opossum
<b>VESPERTILIONIDAE</b>	<b>EVENING BATS</b>
<i>Pipistrellus hesperus</i>	Western pipistrelle
<b>LEPORIDAE</b>	<b>HARES AND RABBITS</b>
<i>Lepus californicus</i>	Black-tailed hare
<i>Sylvilagus audubonii</i>	Audubon cottontail
<i>Sylvilagus bachmani</i>	Brush rabbit
<i>Sylvilagus sp.</i>	Cottontail
<b>SCIURIDAE</b>	<b>SQUIRRELS</b>
** <i>Citellus mohavensis</i>	Mohave ground squirrel
** <i>Citellus tereticaudis ssp. chlorus</i>	Coachella Valley ground squirrel
** <i>Glaucomyys sabrinus</i>	Northern flying squirrel
<i>Otospermophilus beecheyi</i>	Beechey ground squirrel
<i>Ammospermophilus leucurus</i>	Antelope ground squirrel
** <i>Ammospermophilus nelsoni</i>	San Joaquin antelope ground squirrel
<i>Eutamias merriami</i>	Merriam chipmunk
<i>Sciurus griseus</i>	Western gray squirrel
<b>GEOMYIDAE</b>	<b>POCKET GOPHERS</b>
<i>Thomomys bottae</i>	Botta pocket gopher
<b>HETEROMYIDAE</b>	<b>POCKET MICE</b>
<i>Perognathus sp.</i>	Pocket mouse
<i>Perognathus longimembris</i>	Little pocket mouse
** <i>Perognathus longimembris ssp. brevinasus</i>	Los Angeles pocket mouse
<i>Perognathus formosus</i>	Long-tailed pocket mouse

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	Common Name
<i>Perognathus baileyi</i>	Bailey pocket mouse
<i>Perognathus fallax</i>	San Diego pocket mouse
<i>Perognathus californicus</i>	California pocket mouse
<i>Perognathus spinatus</i>	Spiny pocket mouse
<i>Dipodomys sp.</i>	Kangaroo rat
<i>Dipodomys heermanni</i>	Heermann kangaroo rat
<i>Dipodomys panamintinus</i>	Panamint kangaroo rat
** <i>Dipodomys stephensi</i>	Stephens' kangaroo rat
<i>Dipodomys ingens</i>	Giant kangaroo rat
<i>Dipodomys merriami</i>	Merriam kangaroo rat
** <i>Dipodomys merriami ssp parvus</i>	Cismontsne Merriam kangaroo rat
<i>Dipodomys nitratoides</i>	San Joaquin kangaroo rat
<i>Dipodomys agilis</i>	Pacific kangaroo rat
<i>Dipodomys deserti</i>	Desert kangaroo rat
<b>CASTORIDAE</b>	<b>BEAVERS</b>
<i>Castor canadensis</i>	Beaver
<b>CRICETIDAE</b>	<b>RATS AND MICE</b>
<i>Reithrodontomys megalotis</i>	Western harvest mouse
<i>Peromyscus crinitus</i>	Canyon mouse
<i>Peromyscus californicus</i>	California mouse
<i>Peromyscus eremicus</i>	Cactus mouse
<i>Peromyscus maniculatus</i>	Deer mouse
<i>Onychomys torridus</i>	Southern grasshopper mouse
<i>Neotoma sp.</i>	Wood rat
<i>Neotoma albigula</i>	White-throated wood rat
<i>Neotoma lepida</i>	Desert wood rat
<i>Neotoma fuscipes</i>	Dusky-footed wood rat
<i>Microtus pennsylvanicus</i>	Meadow mouse
<i>Microtus californicus</i>	California meadow mouse
<b>MURIDAE</b>	<b>OLD WORLD RATS AND MICE</b>
* <i>Mus musculus</i>	House mouse
<b>CANIDAE</b>	<b>FOXES, WOLVES AND COYOTES</b>
<i>Canis latrans</i>	Coyote
<i>Vulpes macrotis</i>	Kit fox
<i>Urocyon cinereoargenteus</i>	Gray fox
<b>URSIDAE</b>	<b>BEARS</b>
* <i>Ursus americanus</i>	Black bear
<b>PROCYONIDAE</b>	<b>RACCOONS</b>
<i>Bassariscus astutus</i>	Ringtail
<i>Procyon lotor</i>	Raccoon
<b>MUSTELIDAE</b>	<b>WEASELS AND SKUNKS</b>
<i>Mustela frenata</i>	Long-tailed weasel

### Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

<b>Vertebrate Animals</b>	
<b>Latin Name</b>	<b>Common Name</b>
** <i>Taxidea taxus</i>	American badger
<i>Spilogale putorius</i>	Spotted skunk
<i>Mephitis mephitis</i>	Striped skunk
<b>FELIDAE</b>	<b>CATS</b>
<i>Felis concolor</i>	Mountain lion
<i>Lynx rufus</i>	Bobcat
<b>EQUIDAE</b>	<b>HORSES, BURROS AND ZEBRAS</b>
* <i>Equus asinus</i>	Feral donkey
<b>CERVIDAE</b>	<b>ELKS, MOOSE, CARIBOU, DEER</b>
<i>Odocoileus hemionus</i>	Mule deer
<b>BOVIDAE</b>	<b>SHEEP AND GOATS</b>
<i>Ovis canadensis</i>	Bighorn
Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season.	

**B.8 - Revised Vegetation and Special Status Plants Survey  
(Scott White Biological Consulting, February 2009)**





# MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

October 2007  
(Revised 2 February 2009)

Prepared for:  
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Prepared by:  
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Project site location: USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.

APN: 0304-082-04, 0304-091-12, 0304-091-13, 0304-091-21

Owner: RCK Properties, Tim Wood

Applicant: Urban Environs, Redlands, Calif.

Principal Investigator: Scott D. White, Scott White Biological consulting (above).

CERTIFICATION: I hereby certify that the statements furnished in this report and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me and under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DATE: 2 Feb 2009 SIGNED: Scott D White  
Scott D. White, Report Author

Additional field work performed by:

DATE: 2 Feb 2009 SIGNED: Justin Wood  
Justin Wood

# MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

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# MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

Scott D. White  
SCOTT WHITE BIOLOGICAL CONSULTING  
2 February 2009

## II: SUMMARY

This report describes results of field surveys for special status plants at the former Moon Camp site in Fawnskin (unincorporated San Bernardino County, California). The project site is about 62 acres. Several listed threatened or endangered plants occur in specialized habitat types in Big Bear Valley and have been found on the site during previous field surveys. The present field work was completed in 2007, a year of very low rainfall. Thus, these surveys cannot support a conclusion that special status plants may be absent from the site. Despite the poor rainfall, one listed threatened species (ash-gray Indian paintbrush) and apparent genetic intergrades of another listed plant (southern mountain buckwheat) with a common relative were both found on the site. Several other special status plants also were found. The proposed project would directly affect ash-gray Indian paintbrush by taking plants and occupied habitat. It also would indirectly affect ash-gray Indian paintbrush, southern mountain buckwheat intergrades, and pebble plain habitat through a variety of off-site or "edge" effects described in Section VII. of this report. The project also would remove numerous trees subject to regulation under the San Bernardino County Native Plant Protection Policy. Further, the project would necessitate alterations to drainageways that may be subject to state or federal regulation as streambeds, wetlands, or waters of the US. We recommend consulting with local, state, and federal agencies as needed to ensure compliance with these laws and policies. We also recommend follow-up botanical surveys to determine presence or absence of other special status meadow species. In order to mitigate take of federally listed plants, we recommend funding off-site habitat preservation and management at a 3:1 ratio for direct effects and at 1:1 ratio for indirect effects.

## III: PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of Fawnskin, in unincorporated San Bernardino County. It is about 62 acres, on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from about 6750 feet near the lakeshore to about 6,960 feet in the northeastern portion of the site.

The project site is within the Big Bear Lake watershed, mapped and described in the Open Space element to San Bernardino County's General Plan (County of San Bernardino 1991), as follows: "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

This report addresses special status plant communities and plant species occurring or potentially occurring on the property and incorporates prior botanical work done at the same property, cited below.

#### IV. FOCUSED STUDY / SPECIES OF CONCERN

There are four federally listed threatened or endangered plant species nearly endemic to meadows and three endemic to "pebble plain" and similar upland habitats in the Big Bear Valley of the northern San Bernardino Mountains (USDI Fish and Wildlife Service 1984, 1998). In addition, there are numerous other special status plant species occurring in these or other habitats in the Big Bear Valley (Appendix 2). This report focuses primarily on the following listed threatened or endangered plants:

##### Meadow species:

- San Bernardino bluegrass (*Poa atropurpurea*)
- Bird-foot checkerbloom (*Sidalcea pedata*)
- California dandelion (*Taraxacum californicum*)
- Slender-petaled thelypodium (*Thelypodium stenopetalum*)

##### Pebble plain species:

- Bear Valley sandwort (*Arenaria ursina*)
- Ash-gray Indian paintbrush (*Castilleja cinerea*)
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*)

Several special status plants including ash-gray Indian paintbrush have been reported from the project site in prior botanical surveys (Michael Brandman Associates 2000; White & Leatherman BioServices 2002). White and Leatherman (2002) also mapped the extent of suitable habitat for ash-gray Indian paintbrush, based on the extent of its host plant, Wright's matting buckwheat. Bear Valley sandwort is reported from the site in the California Natural Diversity Data Base (California Department of Fish and Game 2007). None of the listed meadow species are known from the site.

#### V. METHODS

Scott D. White reviewed available literature to identify special status plants or plant communities known from the project site and vicinity. Literature sources included previous biological reports addressing the site (Michael Brandman Associates 2000; White & Leatherman BioServices 2002), the California Natural Diversity Data Base (California Department of Fish and Game 2007a, USGS Fawnskin, Big Bear City, Big Bear Lake, Butler Peak, Keller Peak, and Moonridge 7½' topo quads), California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001), the CNPS *Electronic Inventory* (2007, for the same quads) and compendia of special status species published by the US Fish and Wildlife Service (2006) and California Department of Fish and Game (2007b). All species identified by this literature review, and others known from the general region, are included in Appendix 1 or 2 (attached). Appendix 1 lists those species not considered for this report due to elevational or geographic ranges, or specialized habitat requirements not found on the site. Appendix 2 lists special status species known from comparable habitats in the region and summarizes their natural history, conservation status, and occurrence probability on-site.

Scott D. White and Justin Wood (of Scott White Biological Consulting) visited the site on 30 April, 7 June, and 8 August 2007 to view special status habitats (pebble plains), compare present conditions with prior conditions, confirm presence of special status plants described from the site in prior reports, and to survey for additional special status plants not found during earlier surveys. During these visits we focused our attention on pebble plains and lakeshore areas, which could support listed threatened or endangered species. We walked over all pebble plain habitat on all three

field dates, and the entire length of the lakeshore on the project site on 30 April and 7 June. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), Abrams (1923-1960), and other regional references. All species noted on the site are listed in Appendix 3.

In conformance with California Department of Fish and Game guidelines (2000), surveys were (a) conducted during flowering seasons for the special status plants known from the area, (b) floristic in nature, (c) consistent with conservation ethics, (d) systematically covered all habitat types on the site, and (e) well documented, by this report. However, due to very low rainfall in 2006-2007 (when current surveys were done) and 2001-02 (the year of previous White & Leatherman surveys), results of these field surveys should not be used to conclude "absence" for any special status plants not found.

White and Leatherman BioServices (2002) mapped pebble plain habitat and open upland habitat supporting Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*). That mapping is incorporated here as base maps for rare plant occurrences and habitat on the site.

## VI. RESULTS

Utility of field surveys during 2007 was limited on this site and throughout southern California due to a very poor rainfall year. Previous botanical field work was completed during 2002, also a drought year. Many plant species are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year, and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist in the soil as inactive seed, bulbs, or rootcrowns. Most of the special status plants of the Big Bear area are perennial herbs (see text below), and we were not able to make conclusive determinations of "present" or "absent" based on these field surveys. Instead, we have used previous reports and our own judgement of habitat quality to estimate the probability that each special status plant might occur on the site.

### VI. A. VEGETATION

#### VI. A. 1. Common Vegetation Types

Jeffrey pine forest: Most of the site above Highway 38 is covered by the Jeffrey pine series (Sawyer and Keeler-Wolf 1995). This vegetation also matches descriptions of Jeffrey pine forest (Holland 1986; McBride 1988), and montane coniferous forest (Munz 1959). Jeffrey pine forest covers most of the eastern half of the project site and occurs in patches interspersed with pebble plains (below) in the western half. Jeffrey pine (*Pinus jeffreyi*) is the dominant tree; white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kelloggii*) occur throughout Jeffrey pine forest, at lower densities. The understory is sparse, consisting of scattered shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), cupleaf ceanothus (*C. greggii*), deer brush (*C. integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*C. ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbes in scattered patches. Jeffrey pine forest occurs in mountains throughout most of California at elevations between about 5000 and 9000 feet. Many local and regional associations have been described (Sawyer and Keeler-Wolf 1995).

Some, but not all, of the Jeffrey pine forest on the Moon Camp site provides suitable habitat for listed threatened or endangered plant species. In particular, areas of fairly open forest cover where Wright's matting buckwheat occurs are suitable for ash-gray paintbrush, a federally listed threatened species occurring in pebble plains (below) and open Jeffrey pine forest. These areas are identified on

Figure 3. Other special status plants, but not listed species, could also occur throughout the remainder of mapped Jeffrey pine forest.

Lake Shoreline: In the western half of the property, the site's southern boundary is at the shore of Big Bear Lake. Most plants along the shore itself are herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium ciliatum*), wire-grass (*Juncus arcticus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Numerous seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur there.

Just above the high-water level, there are small patches of various upland and wetland vegetation types. These patches are too small to map. Small areas of Jeffrey pine forest are interspersed with open wet meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). There are no alkaline meadows or dry meadows (below) along the lake shore. Small patches of wet meadows may provide suitable habitat for several special status plants (below), but we were unable to determine whether they are present or absent due to poor rainfall.

#### VI. A. 2. Special-status Vegetation

Pebble Plain: Pebble plain occurs in a single patch at the crest of a hill, in the western portion of the site north of Highway 38 (Figure 3). Pebble plain (also called pavement plain) was described by Derby and Wilson (1978, 1979). A detailed discussion was prepared by the San Bernardino National Forest (1990) and brief descriptions appear in Holland (1986) and Sawyer and Keeler-Wolf (1995). The substrate consists of clay soil with quartzite pebbles and gravel that are continually pushed to the surface, evidently through frost action (Holland 1986). Vegetation structure on these sites is similar to the mat-forming structure of alpine sites at much higher elevations. Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. At least two species, both listed as endangered, are strictly endemic to Big Bear pebble plain habitats: Bear Valley sandwort and southern mountain buckwheat (Derby and Wilson 1978). Several other special status plants, including other listed threatened or endangered species, also occur on pebble plain habitat.

On the Moon Camp site, much of the pebble plain habitat has been disturbed by vehicles. This disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for special status plants (San Bernardino National Forest 1990). Based on National Forest management efforts at other sites, vehicle disturbance apparently does not permanently alter habitat suitability for these species. For example, the Forest Service has fenced degraded pebble plains in the Sugarloaf area and found that plant diversity returns after a few years.

Our habitat map (Figure 3) indicates pebble plains themselves, and also indicates adjacent open forest with high cover of Wright's matting buckwheat, where we observed suitable habitat for species which tend to occur in both pebble plains and adjacent open forest habitat.

Pebble plains of the Big Bear area (above) are classified as "southern montane black sagebrush pebble plains" by CDFG (2002), "a series or association considered rare and worthy of consideration" by the California Natural Diversity Data Base. Pebble plains on the project site support at least one listed threatened plant, possibly two other listed species, and three other special status plants.

Wet Meadow: Small patches of meadow occur along the lakeshore, south of Highway 38. They grade into upland grasslands, and we could not delineate their extent due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., "wet meadows") or may have

saturated soils only seasonally or during wet years (called “dry meadows,” “xeric meadows,” or “vernal meadows”). Meadows of the San Bernardino Mountains were described by Krantz (1994). They are generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows support sagebrush (*Artemisia tridentata*, *A. rothrockii*). These meadows themselves are not ranked as special status communities by CDFG (2002) but several locally endemic plants occur in them and they therefore are recognized locally as important habitats (Krantz, no date). Three listed threatened or endangered plants of wet meadow habitats could occur on the Moon Camp site, though only with low or moderate probabilities: bird’s foot checkerbloom (*Sidalcea pedata*), San Bernardino bluegrass (*Poa atropurpurea*), and California dandelion (*Taraxacum californicum*). Other special status or listed species of pebble plains and their margins could also occur in meadow margins (e.g., ash-gray paintbrush).

#### VI. B. Special status plants

Plant or animal species identified by state or federal agencies or by private conservation organizations may be assigned special conservation status due to declining numbers, vulnerability to habitat change, or restricted distributions. Some species are listed as threatened or endangered under state or federal Endangered Species Acts. Other special status plants are included in the California Native Plant Society’s *Inventory* or other compilations listed in the Methods section (above) and summarized in Appendix 2. Big Bear Valley has a high proportion of rare and locally endemic species (Krantz, no date; Krantz 1994). Each special status plant species is addressed in Appendix 1 or 2 (habitat and range, agency status and probability of occurring on the site). Species observed on the site and listed or candidate species potentially occurring on the site are also described below.

##### VI. B. 1. Listed threatened or endangered plants occurring on the site:

Ash-gray Indian paintbrush (*Castilleja cinerea*): Ash-gray Indian paintbrush is a federally-listed threatened species and is on CNPS’s List 1B. It is a root parasite on other plants, often parasitizing the listed threatened southern Mountain buckwheat (below) or a similar but common mat-forming buckwheat (*E. wrightii* ssp. *subscaposum*). It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows and seeps, and open pinyon or Jeffrey pine forest between about 5,900 and 10,000 feet elevation. It is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). It was reported and mapped on the project site by Michael Brandman Associates (2000) and in the California Natural Diversity Data Base (2007). White & Leatherman BioServices (2002) found that it was more widespread than reported earlier, occurring in the pebble plains and open pine forests (Figure 3), where it appears to be parasitizing *Eriogonum wrightii* ssp. *subscaposum*. We confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*): Southern mountain buckwheat is federally listed as threatened and is on CNPS’s List 1B. It is a mat-forming woody perennial, generally flowering late in the season (between about June and August). It is endemic to pebble plains habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains, between about 5800 and 7500 feet elevation. It often serves as a host plant for the hemi-parasitic *Castilleja cinerea* (above) and also is a food plant for a newly described locally-endemic San Bernardino blue butterfly. It is very similar to a more common plant, Wright’s matting buckwheat (*E. wrightii* ssp. *subscaposum*), which is common on the project site. The two species are distinguished by presence or absence of branching in their inflorescences (Hickman 1993; Reveal 1989, 2005). We examined flowers and remains of dried inflorescences of mat-forming buckwheats throughout the project site

on each site visit. Most of them were either unidentifiable (due to absence of inflorescences) or were identified as Wright's matting buckwheat, based on their branching inflorescences. But on the mapped pebble plain (Figure 3), during the 8 August site visit, about 10-20% of the matting buckwheat plants had mostly (but not exclusively) unbranched inflorescences. Reveal (2005) noted that the two plants intergrade to some extent in Big Bear Valley and A. Sanders (pers. comm.) has made similar observations. We conclude that some of the matting buckweats on pebble plains at the Moon Camp site are intergradations between the endangered southern mountain buckwheat and the common Wright's matting buckwheat.

VI. B. 2. Special status plants occurring on the site but not listed as threatened or endangered:

Parish's rock-cress (*Arabis parishii*): Parish's rock cress is CNPS's List 1B. It is a perennial herb that typically blooms in April or May. It occurs in pebble plains and other sites with heavy or rocky soils, including carbonate soils, within pinyon woodlands and montane forests between about 3,900 and 8,000 feet elevation. It is endemic to the San Bernardino Mountains. Suitable habitat occurs on the project site in areas shown as ash-gray paintbrush habitat on Figure 3. It has been reported from the site (CNDDDB 2001). White & Leatherman BioServices (2002) observed it uncommonly, scattered throughout pebble plain and adjacent open forest habitat. We confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Big Bear Valley woollypod (*Astragalus leucolobus*): Big Bear Valley woollypod is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in rocky soils of montane conifer forests and woodlands and pebble plains, between about 5,600 and 8,000 feet elevation. It is endemic to the high mountains of southern California (San Bernardino, San Gabriel, San Jacinto, and Santa Rosa Mountains). Suitable habitat is found throughout the site. White & Leatherman BioServices (2002) observed it occasionally throughout the project site. We confirmed these occurrences and noted that it was especially common on pebble plains in 2007.

Heckard's paintbrush (*Castilleja montigena*, *C. applegateii* ssp. *martinii*): Heckard's paintbrush is on CNPS's List 4. It is a perennial herb, typically flowering between May and August. It occurs in montane forests between about 6400 and 9200 feet elevation. It is endemic to the San Bernardino Mountains, where it is common in forest habitats throughout the mountain range. It was originally described by Lawrence Heckard (1980), but Heckard regarded it as a minor variant of *Castilleja applegateii* and not as a distinct species in his Jepson Manual treatment of the genus (1993). It occurs occasionally in Jeffery pine forest on the Moon Camp site.

Silver-Haired ivesia (*Ivesia argyrocoma*): Silver-haired ivesia is on CNPS's List 1B. It is a perennial herb that typically blooms between June and August. It occurs in alkaline meadows and seeps, pebble plains, and montane forest between about 4900 and 8800 feet elevation. It occurs in the San Bernardino Mountains and a disjunct site in the mountains of Baja California. It has been reported from the project site by Michael Brandman Associates (2000) and White and Leatherman BioServices (2002), and we observed it throughout areas shown as ash-gray paintbrush habitat on Figure 3.

VI. B. 3. Listed and candidate threatened or endangered plants potentially occurring on the site:

Bear Valley sandwort (*Arenaria ursina*): Bear valley sandwort is federally-listed as threatened and is on CNPS's List 1B. It is a perennial herb and typically blooms between May and August. It occurs on pebble plains and sometimes on carbonate soils, between about 6,400 and 6,900 feet elevation. It is endemic to Big Bear Valley in the San Bernardino Mountains. It has been reported from the Moon Camp site (CNDDDB 2007), but we did not find it on the site in 2007 and it was not noted there by Michael Brandman Associates (2000) or White & Leatherman BioServices (2002).



Due to poor rainfall in 2001-02 and 2006-07, we cannot evaluate whether Bear Valley sandwort was absent during these field surveys due to its disappearance from the site or due to drought-induced dormancy. Suitable habitat occurs in pebble plains on the project site, and we conclude that it has a high probability of occurring.

San Bernardino bluegrass (*Poa atropurpurea*): San Bernardino bluegrass is a federally-listed Endangered species and is on CNPS's List 1B. It is a rhizomatous perennial grass that typically flowers between May and June. It occurs in mesic meadows and seeps between about 4,400 and 8,100 feet elevation. It is known only from the San Bernardino Mountains and Laguna mountains (San Diego County). Marginally suitable habitat occurs along the lakeshore areas on the project site. We did not find it during our field surveys, but we also could not find it at a known occurrence in the area, perhaps due to drought-induced dormancy. Based on habitat, we conclude there is a low probability that it may occur there.

Bird's foot checkerbloom (*Sidalcea pedata*): Bird's foot checkerbloom is a federally- and state-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in meadows and seeps, between about 5,200 and 8,100 feet elevation. It is endemic to the San Bernardino Mountains. Marginally suitable habitat occurs near the lakeshore, though we did not find bird's foot checkerbloom during our field surveys, and it has not been reported there in prior surveys. Based on habitat, we conclude there is a low probability that it may occur.

California dandelion (*Taraxacum californicum*): California dandelion is a federally-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It is endemic to the San Bernardino Mountains, occurring only in and around Big Bear Valley, in meadows and seeps between about 6,300 and 7,800 feet elevation. Marginally suitable habitat occurs in meadow areas near the lakeshore, though the species was not noted during our field surveys or reported in prior surveys. Based on habitat, we conclude there is a low to moderate probability that it may occur on the site.

#### VI. B. 4. Special status plants potentially occurring but not listed as threatened or endangered:

Other special status plant species judged as moderate or greater probability of occurring on the site, but not seen during field surveys and not listed as threatened or endangered are listed below. See also Appendix 2.

Rock sandwort (*Arenaria lanuginosa* ssp. *saxosa*): Moderate probability (meadow, lakeshore)

Crested milk vetch (*Astragalus bicristatus*): High probability (rocky areas)

Big Bear Valley milk vetch (*Astragalus lentiginosus* var. *sierrae*): High probability, open forest

Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*): Moderate probability, meadow

Western sedge (*Carex occidentalis*): Moderate probability, meadow

San Bernardino Mountain owl's clover (*Castilleja lasiorhyncha*): Moderate probability, meadow

San Bernardino Mountains dudleya (*Dudleya abramsii* ssp. *affinis*): Moderate probability, pebble plains

Southern Sierra woolly sunflower (*Eriophyllum lanatum* var. *obovatum*): High probability, forest

Jepson's bedstraw (*Galium jepsonii*): High probability, forest

Johnston's bedstraw (*Galium johnstonii*): Low to moderate probability, forest

Parry's sunflower (*Hulsea vestita* ssp. *parryi*): Low to moderate probability (open slopes)

Duran's rush (*Juncus duranii*): Moderate probability, meadow

Short-sepaled lewisia (*Lewisia brachycalyx*): Moderate probability, meadow

Baldwin Lake linanthus (*Linanthus killipii*): High probability on pebble plains

San Bernardino Mountain monkeyflower (*Mimulus exiguus*): High probability, meadow margin, etc.  
Purple monkeyflower (*Mimulus purpureus*): High probability, meadow margin, etc.  
Chickweed oxytheca (*Oxytheca caryophylloides*): High probability, open forest  
Parish's yampah (*Perideridia parishii* ssp. *parishii*): Low to moderate probability, meadow  
Transverse Range phacelia: (*Phacelia exilis*): High probability, meadow margin, etc.  
Mojave phacelia (*Phacelia mohavensis*): High probability, meadow margin, etc.  
Bear Valley phlox (*Phlox dolichantha*): High probability, throughout  
Bear Valley pyrrocoma (*Pyrrocoma uniflora* ssp. *gossypina*): Low - moderate probability, meadow  
Parish's rupertia (*Rupertia rigida*): High probability, throughout  
Tehachapi ragwort (*Senecio ionophyllus*): Moderate probability, throughout  
Laguna Mountains jewelflower (*Streptanthus bernardinus*): Moderate probability, forest  
Southern jewelflower (*Streptanthus campestris*): High probability, forest  
Pine green-gentian (*Swertia neglecta*): High probability, forest  
Small-flowered bluecurls (*Trichostema micranthum*): High probability, meadow

## VI. C. PROTECTED PLANTS

The San Bernardino County Plant Protection and Management policy (2007) regulates removal of native trees greater than 6 inches diameter at breast height (dbh). Jeffrey pines and other native forest trees greater than 6 inches dbh occur throughout the site.

## VII. IMPACTS

### VII. A. Impacts to Special Status Plants and Habitat

Project construction would result in grading new roads, driveways and building pads throughout most of the property, removing much of the native vegetation, including special status plants and habitat, and disturbing soils throughout most of the site. Even where special status plants are not removed by grading, most future land uses on individual lots (e.g., landscaping) would not be subject to environmental review and would cause further loss of these plants and habitats. Indirect project impacts (i.e., impacts outside the proposed residential lots and limits of grading) would affect rare plant habitat in a proposed set-aside area and, if it occurs, off-site to the north. Thus, project impacts would eliminate or degrade sensitive habitat types (pebble plain) and occupied rare plant habitat (Figure 3, Figure 5). Pebble plains and open forest patches on the site are occupied by at least one threatened or endangered plant (ash-gray Indian paintbrush); genetic intergrades of another listed plant (southern mountain buckwheat) with a common related species; and four other special status plants (Parish's rock-cress, Heckard's paintbrush, Bear Valley woollypod and silver-haired ivesia). Development would eliminate or substantially reduce numbers of all five plants. Although these habitats are somewhat degraded by vehicles and invasive plants (see Section VI. A. above and "edge effects," below), adverse impacts to listed species would meet the CEQA threshold for mandatory findings of significance.

Construction could also eliminate or substantially reduce numbers of five other listed threatened or endangered plants that could occur on the site but were not found there, including Bear Valley sandwort, southern mountain buckwheat, bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion. The maximum possible extent of these impacts, if all four plants occur, would be loss of Bear Valley sandwort and southern mountain buckwheat in pebble plains areas discussed above, and possible loss of bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion from small meadow areas bordering the lakeshore. These impacts would meet the CEQA threshold for mandatory findings of significance if any of these listed plants occur on the site.

Impacts to special status plants not listed as threatened or endangered (Section IV. B. 4.) generally would not meet the CEQA threshold for mandatory findings of significance.

Adverse project impacts to pebble plains and rare plants occurring (or potentially occurring) on pebble plains are somewhat reduced by the project's design, which designates an open space lot on the pebble plain area and part of the occupied ash-gray Indian paintbrush habitat (Figure 3). However, the long-term conservation value of the proposed open space lot would be minimal without designating buffer areas and providing for active on-site land management to prevent indirect "edge effects" of existing and proposed new adjacent land uses.

The term "edge effect" describes the effects of developed land uses on adjacent natural habitat areas (e.g., habitat adjacent to new development or in set-aside areas surrounded by development). To date, most analyses of edge effects on habitat reserves have focused on sensitive wildlife species. The following discussion of edge effects on rare plants is based on an analysis by the Conservation Biology Institute (2000) addressing San Fernando Valley spineflower, an endemic southern California species threatened by development and surrounding land uses in Los Angeles and Ventura Counties. Rare plants near developed lands tend to die out due to a variety of edge effects, including:

- Exclusion by invasive weedy plants introduced deliberately or accidentally into developed landscapes.
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation.
- Altered hydrology caused by irrigation overspray, road runoff, or water diversions installed for erosion control.
- Direct damage by pets and feral animals (e.g., digging by dogs and cats).
- Indirect effects of non-native animals, such as elimination of native pollinators by invasive Argentine ants.
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes.
- Pollution from oversprayed or runoff landscaping chemicals (insecticides, herbicides, fertilizers).

Conservation planners design "buffer areas" to separate managed sensitive species or habitat reserve areas from the indirect effects of adjacent land uses. The Conservation Biology Institute (2000) modeled "buffer areas" for then-proposed San Fernando Valley spineflower preserve areas in Ventura County. In their analysis, buffer areas were defined as preserved land surrounding the rare plants, where land uses were strictly limited to activities consistent with reserve management. For example, buffer areas function to separate rare plant habitat from adverse effects of weeds propagating along trails or through fuel modification zones. Thus, roads, trails, or fuel modification land uses are not consistent with buffer function. The Conservation Biology Institute analysis (2000) estimated that buffer widths of 200 feet would be "highly likely to be effective" in buffering San Fernando Valley spineflower occurrences from a series of adverse edge effects from adjacent land uses, and "moderately effective" against two adverse edge effects (invasive animals and increased fire frequency). In their analysis, a wider hypothetical buffer (300 ft.) would not increase estimated effectiveness against fire and invasive animals. We therefore use 200 feet as the best available estimate of the range of adverse edge effects on special status plant occurrences.

The proposed project could also cause "edge effects" to proposed open space on-site and to adjacent vacant land to the north and east as new residents increase activity and disturbance to surrounding native habitat, through the effects listed above.

Most land surrounding the Moon Camp site is in private ownership, except in the northeastern

corner where National Forest land is adjacent to the north and east. None of the surrounding private land is managed or proposed for management as a conservation area. Most adjacent private land on all sides has been developed. There is a pebble plain area on National Forest land on the ridge north of the Moon Camp site, but it is more than 200 feet from the project site and thus should be sufficiently buffered from project-related edge effects. We conclude that the proposed project's off-site edge effects would not meet the CEQA threshold for mandatory findings of significance.

Much of the Moon Camp project site, including the proposed open space lot on-site, is now subject to edge effects of adjacent residential development and roads, especially Highway 38 (Figure 4). The proposed project would eliminate or further degrade most remaining occupied rare plant habitat (above) and would indirectly affect nearly all of the proposed open space lot by introducing new edge effects closer to the open space area (Figure 5). The small portion of the proposed open space lot not within 200 feet of proposed new development is already within 200 feet of Highway 38 and thus subject to existing edge effects (Figures 4 and 5).

#### VII. B. Impacts to Protected Plants

Tract Map approval and subsequent construction would cause substantial reduction in Jeffrey pine forest tree canopy cover throughout most of the site. This impact would not necessarily be regarded as significant under CEQA, but could conflict with San Bernardino County's general plan and would require permitting under the County's Native Plant Protection policy.

#### VII. C. Impacts to Jurisdictional Streambeds

Road construction and other elements of the project would alter ephemeral channels, and possibly to meadows or other lakeshore habitat that may meet state or federal jurisdictional criteria as streambeds, wetlands, or waters of the United States. These impacts would not necessarily be regarded as significant under CEQA, but could require permitting under Section 1603 of the California Fish and Game Code or Section 404 of the federal Clean Water Act through the California Department of Fish and Game or US Army Corps of Engineers, respectively.

### **VIII. RECOMMENDED AGENCY CONSULTATION OR FURTHER STUDIES**

1. To minimize loss of forest canopy on the property, we recommend mapping and inventorying trees on the site, and designing roads and building sites to minimize the number of overstory trees to be removed. Once those trees that must be removed are identified, we recommend applying to San Bernardino County for applicable permits under the County's native plant protection policy.

2. We recommend preparing a delineation of jurisdictional streambeds, wetlands, and waters of the United States to determine whether Section 1603 of the California Fish and Game Code or Section 404 of the federal Clean Water Act are applicable on the property. The delineation report should address channels crossing the site and the lakeshore area described in this report.

3. The project would take at least one federally listed plant (ash-gray Indian paintbrush) and its occupied habitat through direct impacts (occurrences within proposed roadways or residential lots) and possibly two other federally listed plants (Bear Valley sandwort and southern mountain buckwheat) through indirect impacts to the proposed open space lot. If project development requires permitting or funding through any federal agency (e.g., the Army Corps of Engineers under Section 404 of the federal Clean Water Act) then that agency must consult with the US Fish and Wildlife Service under Section 7 of the federal Endangered Species Act.

4. Field surveys to date have occurred in very dry years and have been unable to determine presence or absence of several listed threatened or endangered plants and numerous other special status plants. We recommend further botanical surveys for these species (Sections V. B. III. and V.

B. IV., above), to be conducted in accordance with California Department of Fish and Game (2000) guidelines. These follow-up surveys should be done in a year when precipitation is at least 40% of average for the area over the "rainfall year" period (1 July - 30 June).

## **IX. MITIGATION AND MONITORING RECOMMENDATIONS**

### **IX. A. MITIGATION RECOMMENDATIONS**

Under CEQA Guidelines, if a project would "reduce the number or restrict the range of a threatened or endangered species," then a lead agency must find that the project would have a significant effect. Without mitigation, the proposed development would meet this criterion for mandatory findings of significance, due to adverse impacts to the threatened ash-gray Indian paintbrush, and potential adverse impacts to listed plants not found on the site. CEQA defines mitigation as (a) avoiding the impact altogether by not taking a certain action or parts of an action, (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation, (c) rectifying the impact by repairing, rehabilitating, or restoring the impacted environment, (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, or (e) compensating for the impact by replacing or providing substitute resources or environments. Potential application of these five types of mitigation to the proposed project are addressed below:

Avoidance or Minimization: Avoiding or minimizing impacts to the occupied listed plant habitat would necessitate either abandoning the project or redesigning it to eliminate or minimize grading or other disturbance (including long-term edge effects of new development) to soils and hydrology on the occupied habitat and throughout a substantial buffer area. These measures would substantially reduce project feasibility and, even if implemented, long term persistence of the listed plants would be doubtful due to isolation caused by existing and proposed development.

Rectifying the impact or reducing it over time: Both these types of mitigation apply only to temporary disturbances (e.g., pipeline construction, in which the disturbed ground may be revegetated following construction). These measures are not applicable for the proposed Moon Camp project.

Compensating for the impact: Compensation is widely used as mitigation for impacts to threatened or endangered species, both as mitigation for CEQA analysis and as Habitat Conservation Plans (HCPs) negotiated with the US Fish and Wildlife Service under the federal Endangered Species Act, if protection of sufficient off-site habitat can be achieved. Typically, mitigation ratios are about 3:1 (i.e., 3 acres of habitat purchased or protected for each acre lost to development).

Off-site protection is a viable measure for impacts to ash-gray Indian paintbrush and other regionally endemic threatened or endangered plants potentially occurring on the site. The San Bernardino National Forest actively manages other sites to preserve pebble plain endemic plants, including ash-gray paintbrush. Numerous other privately-owned sites in the Big Bear Valley support pebble plains where disturbances would be more manageable due to adjacent land uses and relative isolation from developed areas. The California Wildlife Foundation has established a fund, administered by the California Department of Fish and Game, for eventual purchase or protection of pebble plain habitat in the Big Bear area.

We recommend the following measures to mitigate significant or potentially significant adverse impacts to listed threatened or endangered plants:

1. We recommend compensating for anticipated loss of a federally-listed threatened plant (ash-gray Indian paintbrush), loss of pebble plain habitat, and potential impacts to other listed species (Bear Valley sandwort, southern mountain buckwheat) by contributing to the funding of purchase

and management of off-site habitat through the California Wildlife Foundation fund, described above, at a level sufficient to purchase or protect 3 acres of habitat for each acre of pebble plain habitat and ash-gray Indian paintbrush habitat to be developed, and at 1:1 ratio for habitat to be indirectly degraded by edge effects of the proposed development (see Figure 5).

2. If follow-up surveys (Section VIII., above) determine that no other listed plants occur, then we make no further mitigation recommendation. If the surveys determine that one or more listed species occurs in the meadow area, then we recommend delineating the extent of suitable or occupied habitat, evaluating direct or indirect project impacts, and compensating as stated above for impacts to rare plant habitat (i.e., 3:1 for direct impacts, 1:1 for indirect impacts or edge effects).

#### IX. B. MITIGATION MONITORING RECOMMENDATIONS

California law requires monitoring of mitigation measures imposed under CEQA. We recommend monitoring mitigation measures recommended here to verify compliance with conditions of approval. We recommend that the applicant maintain files of all correspondence with agencies, contractors, or other entities pertaining to compliance with the recommendations above (Section VIII and IX.A.), and provide copies of pertinent correspondence to the County upon completion or resolution of each recommendation.

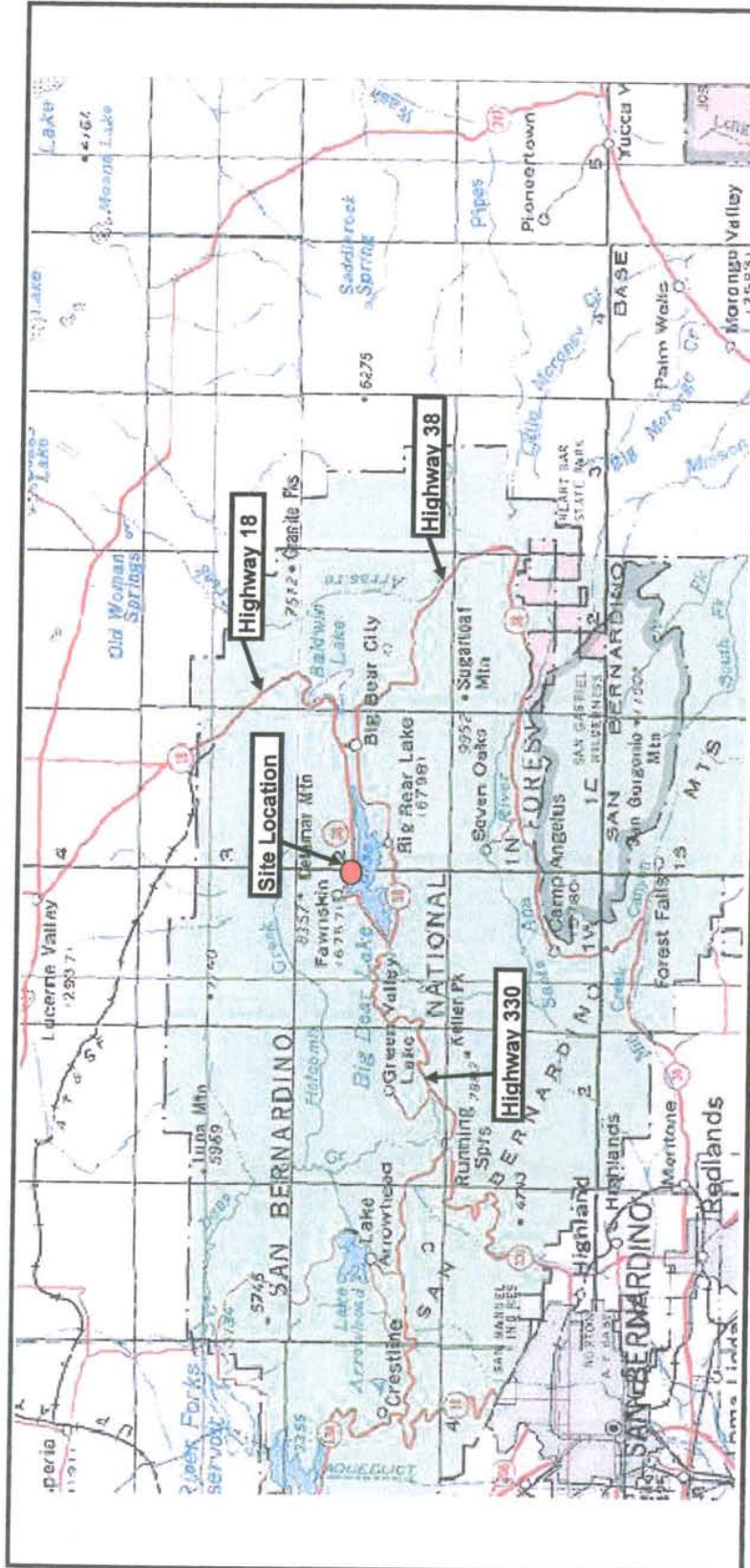
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**Figure 1:  
Vicinity Map**



**Proposed Moon Camp Tentative Tract**

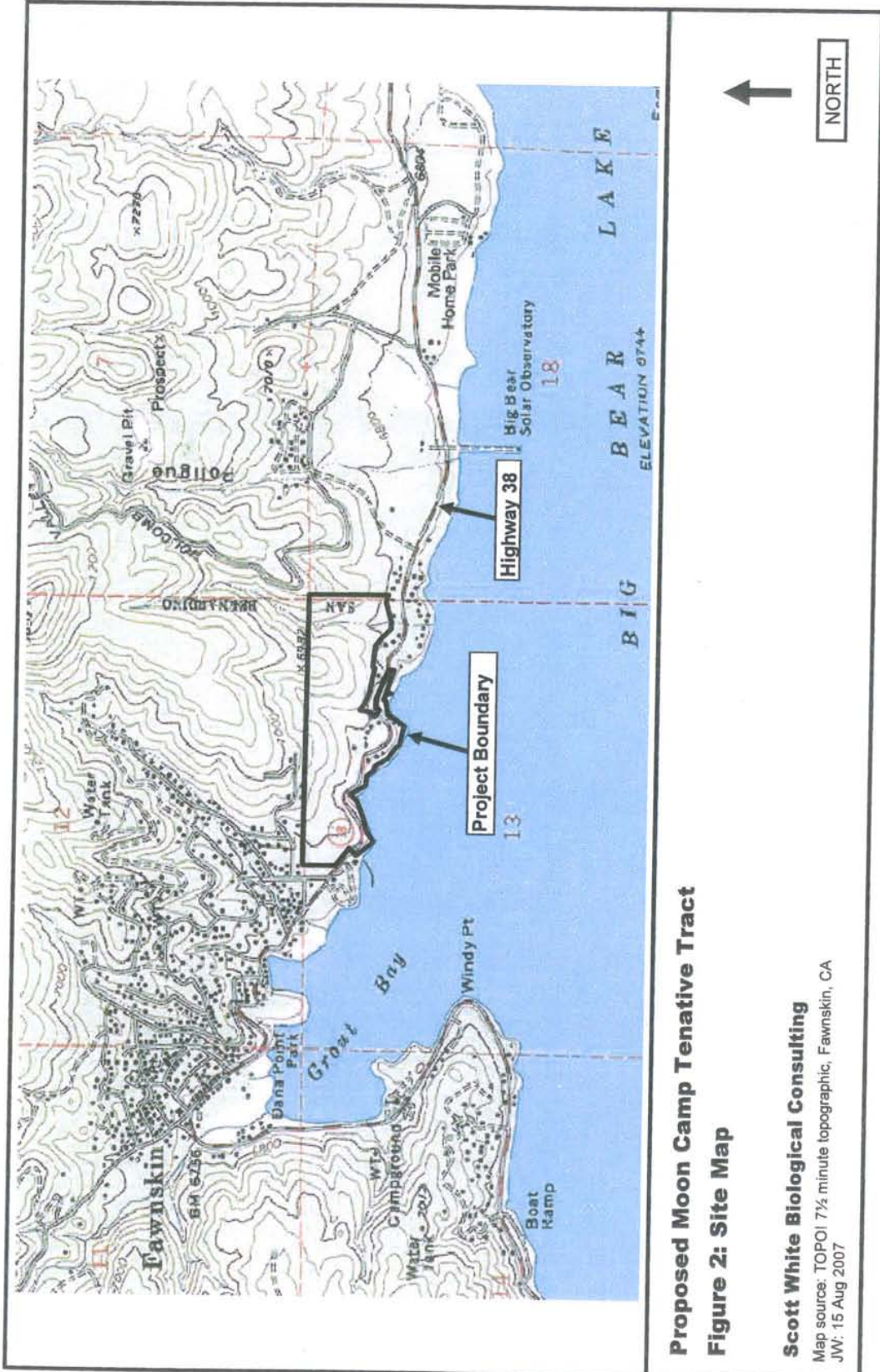
**Figure 1: Vicinity Map**

**Scott White Biological Consulting**

Map source: TOPOI 7 1/2 minute topographic

JW: 15 Aug 2007

**Figure 2:  
Project Site Map**



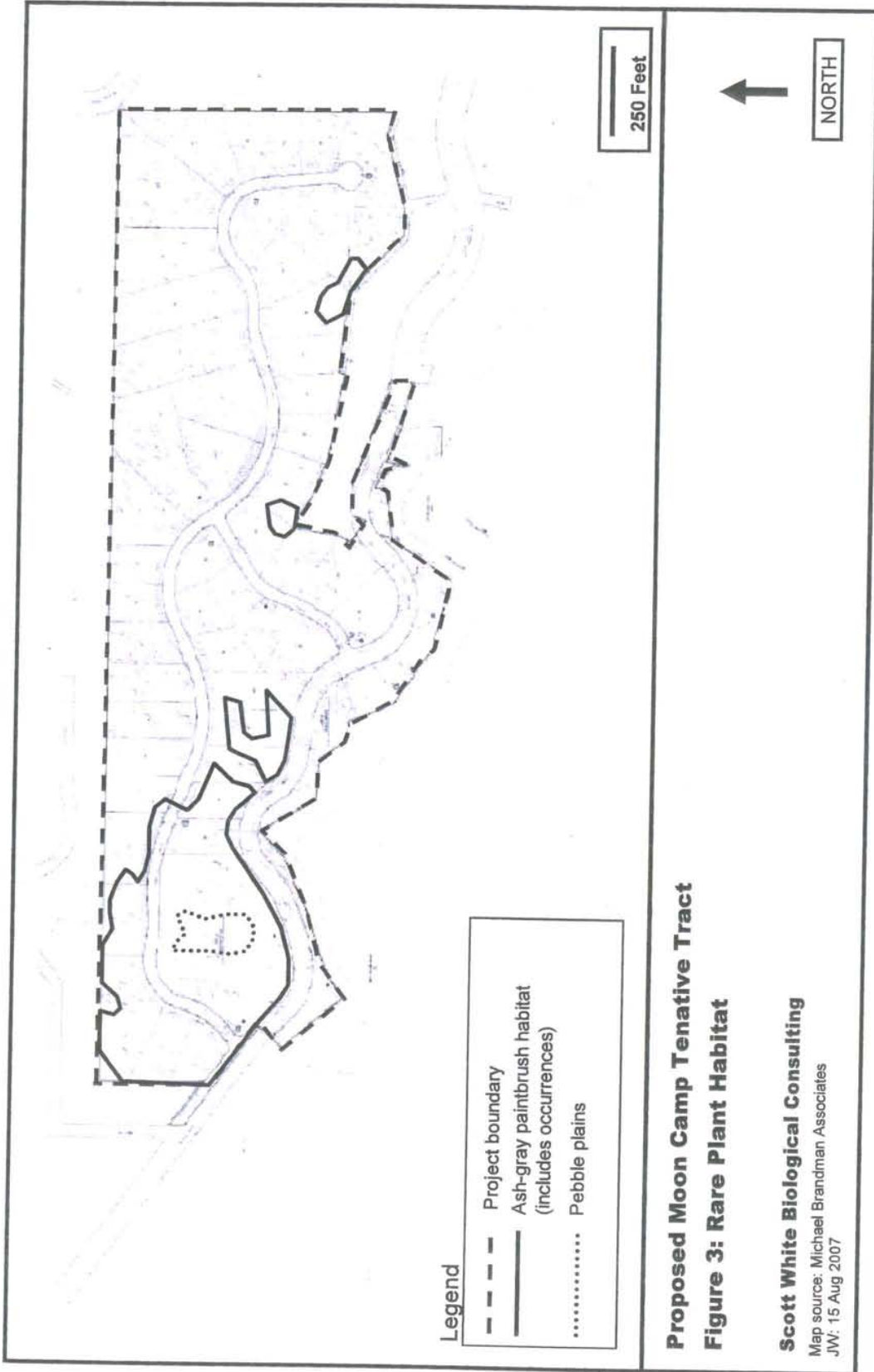
**Proposed Moon Camp Tenative Tract**

**Figure 2: Site Map**

**Scott White Biological Consulting**

Map source: TOPOI 7½ minute topographic, Fawnskin, CA  
 JW: 15 Aug 2007

**Figure 3:  
Rare Plant Habitat**



**Legend**

- - - - - Project boundary
- Ash-gray paintbrush habitat  
(includes occurrences)
- ..... Pebble plains

250 Feet

**Proposed Moon Camp Tentative Tract**

**Figure 3: Rare Plant Habitat**

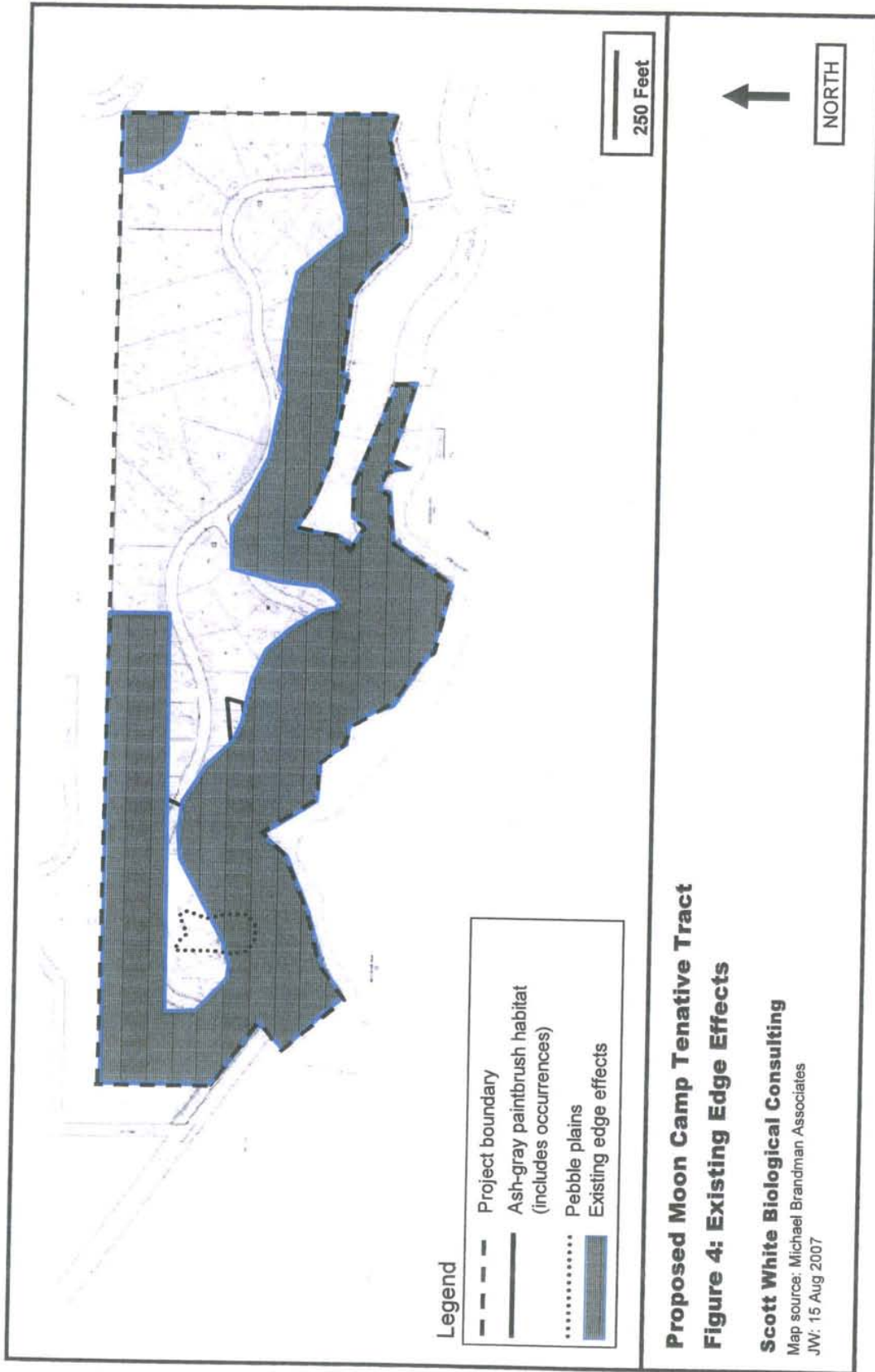
**Scott White Biological Consulting**

Map source: Michael Brandman Associates  
JW: 15 Aug 2007



NORTH

**Figure 4:  
Edge Effect Map**



**Legend**

- - - - - Project boundary
- Ash-gray paintbrush habitat  
(includes occurrences)
- ..... Pebble plains
- Existing edge effects

250 Feet

**Proposed Moon Camp Tentative Tract**  
**Figure 4: Existing Edge Effects**

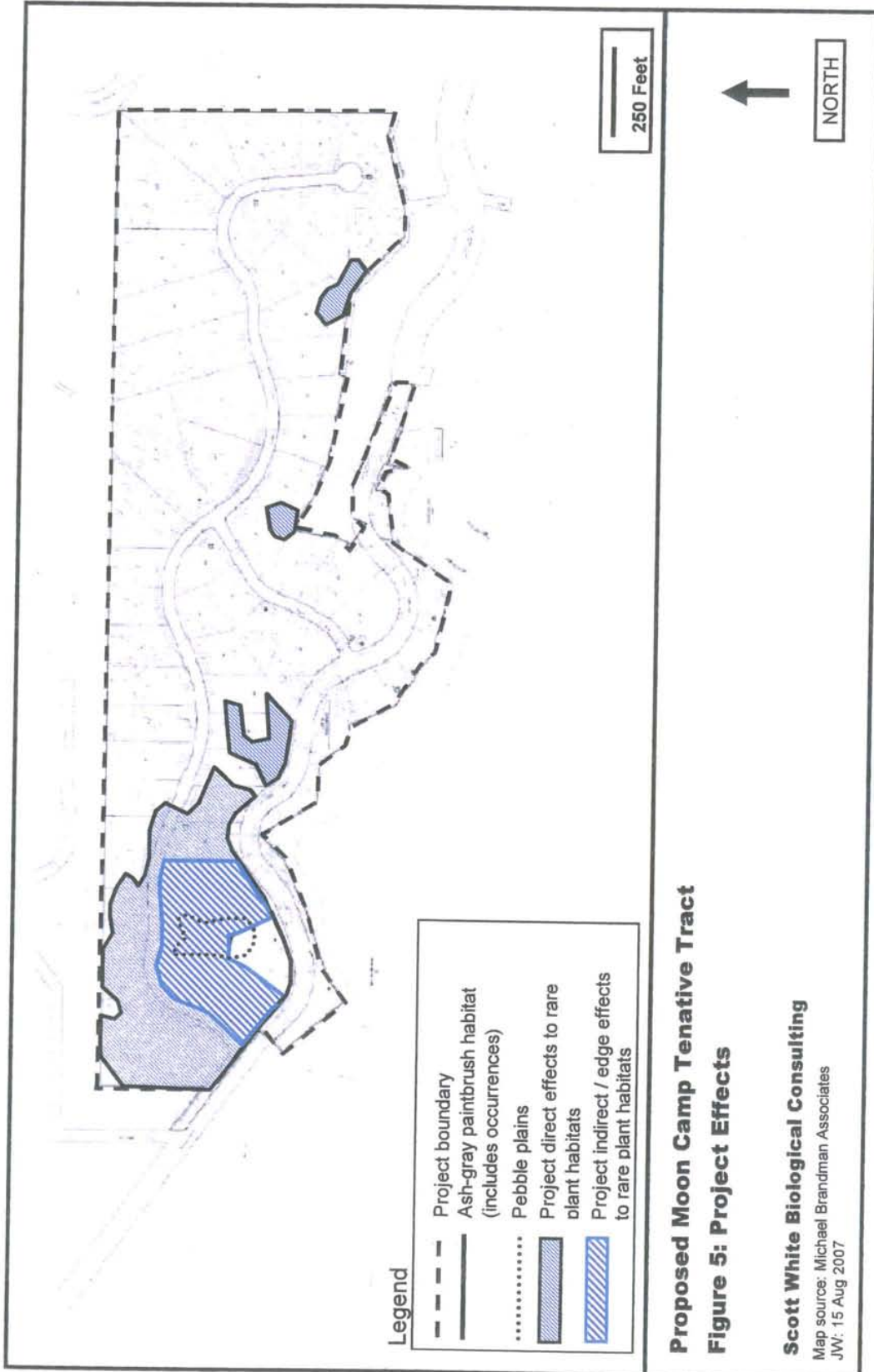
**Scott White Biological Consulting**

Map source: Michael Brandman Associates  
 JW: 15 Aug 2007

↑  
 NORTH



**Figure 5:  
Project Effects**



**Proposed Moon Camp Tentative Tract**  
**Figure 5: Project Effects**

**Scott White Biological Consulting**

Map source: Michael Brandman Associates  
 JW: 15 Aug 2007

**Appendix 1:  
Special Status Species Not Addressed**

**Appendix 1:** Special status plants of the Bear Valley region not addressed due to habitat or range.

Common name	Latin name	Reason for exclusion
White-margined everlasting	<i>Antennaria marginata</i>	Outside geogr. range (only local occurrences in Barton Flats area)
Pinyon rock-cress	<i>Arabis dispar</i>	Outside geogr. range (only local occurrences on desert-facing slopes)
Shockley's rock-cress	<i>Arabis shockleyi</i>	Outside geogr. range (only local occurrences on desert-facing slopes)
Cushenbury milk-vetch	<i>Astragalus albens</i>	No suitable habitat (carbonate)
Triple-ribbed milk-vetch	<i>Astragalus tricarinatus</i>	No habitat (desert shrubland), well above elev. range (below about 4000 ft.), Cushenbury Cyn report erroneous
Parish's small-scale	<i>Atriplex parishii</i>	No suitable habitat (alkali sink)
Fremont barberry	<i>Berberis fremontii</i>	No local occurrences (presumed extinct in Cushenbury area)
Scalloped moonwort	<i>Botrychium crenulatum</i>	No suitable habitat (marshes, bogs)
Plummer's mariposa lily	<i>Calochortus plummerae</i>	Above elev. range (below about 5500 ft.)
Alkali mariposa lily	<i>Calochortus striatus</i>	No habitat (desert alkaline meadows, seeps) above elev. range (below about 5300 ft.)
Parish's daisy	<i>Erigeron parishii</i>	No suitable habitat (carbonate)
Cushenbury buckwheat	<i>Eriogonum ovalifolium</i> var. <i>vineum</i>	No suitable habitat (carbonate)
Moss gentian	<i>Gentiana fremontii</i>	Well below elev. range (occurs in San Gorgonio Wilderness)
Los Angeles sunflower	<i>Helianthus nuttallii</i> ssp. <i>parishii</i>	Well above elev. range (below about 4000 ft. elev.)
Barton Flats horkelia	<i>Horkelia wilderae</i>	Outside geogr. range (endemic to Barton Flats area)
California satintail	<i>Imperata brevifolia</i>	Well above elev. range (below about 3000 ft.)
San Bernardino Mtn. bladderpod	<i>Lesquerella kingii</i> ssp. <i>bernardinus</i>	No habitat (carbonate)
Adder's mouth	<i>Malaxis monophyllos</i> ssp. <i>brachypoda</i>	Well below elev. range (occurs in San Gorgonio Wilderness)
Cienega Seca oxythexca	<i>Oxytheca parishii</i> var. <i>cienegensis</i>	Outside geogr. range (known only from Cienega Seca and Pipes Cyn areas)
Cushenbury oxytheca	<i>Oxytheca parishii</i> var. <i>goodmaniana</i>	No habitat (carbonate)

**Appendix 1:** Special status plants of the Bear Valley region not addressed due to habitat or range.

<b>Common name</b>	<b>Latin name</b>	<b>Reason for exclusion</b>
Frosted mint	<i>Poliomintha incana</i>	No suitable habitat (desert dunes and sandy flats)
Narrow-leaved cottonwood	<i>Populus angustifolia</i>	No San Bernardino Mountain occurrences (local reports unverified)
Latimer's woodland gilia	<i>Saltugilia latimeri</i>	No habitat (desert shrubland, pinyon woodland); above elev. range (below about 6200 ft.)
Slender-petaled thelypodium	<i>Thelypodium stenopetalum</i>	No habitat (alkaline meadows)

**Appendix 2:  
Special Status Species**

**APPENDIX 2:** Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Abronia nana</i> ssp. <i>covillei</i> Coville's dwarf abronia	Perennial herb; carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, about 5200 - 10,200 ft.	May - August	Fed: none Calif: S3.2 CNPS List 4.2	Low (marginally suitable habitat)
<i>Allium parishii</i> Parish's onion	Bulb; open shrubland & woodland, gen. sandy bajadas or mtn slopes, often carbonate soil, about 3000 - 5500 ft. elev.; N San Bern Mtns and Moj Des Mtns, to W Ariz.	Apr - May	Fed: none Calif: S3.3? CNPS List 4.3	Minimal (above elev. range)
<i>Arabis parishii</i> Parish's rock cress	Perennial herb; pebble plains, occas. on carbonate soil; open dry sites in conifer forest; about 5800 - 9500 ft. elev.; San Bernardino Mtns. endemic	April - May	Fed: none Calif: S2.1 CNPS List 1B. 2	Occurs (2007 survey; NDDDB report)
<i>Arenaria lanuginosa</i> ssp. <i>saxosa</i> ( <i>A. confusa</i> ) Rock sandwort	Perennial herb; sandy soils, streams or meadows; about 5900 to 8600 ft. elev.; San Bernardino Mtns, W US and N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS List 2.3	Moderate (moderately suitable habitat)
<i>Arenaria ursina</i> Bear Valley sandwort	Perennial herb, pebble plains, occas. on carbonate soils, about 5900 - 9500 ft. elev.; San Bernardino Mtns. endemic	June - July	Fed: <b>THR</b> Calif: S 2.1 CNPS: List 1B.2	Occurs? (NDDDB record #23)
<i>Aster bernardinus</i> ( <i>Symphytotrichum defoliatum</i> ) San Bernardino aster	Perennial herb; wetlands and margins, near sea level to about 6700 ft. elev.; formerly widespread, Kern Co to San Diego Co, but most sites extirpated	July - Nov	Fed: none Calif: S 3.2 CNPS List 1B.2	Low (field surveys; upper margin of elev. range)
<i>Astragalus bicristatus</i> Crested milk vetch	Perennial herb; rocky slopes, montane conifer forest; about 5500 - 9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	May - August	Fed: none Calif: S3.3 CNPS List 4.3	High (suitable habitat occurs)
<i>Astragalus lentiginosus</i> var. <i>sierrae</i> Big Bear Valley milk vetch	Perennial herb; open rocky soils or compacted areas in pine forest; about 5900 - 8500 ft. elev.; San Bernardino Mtns endemic	April - August	Fed: none Calif: S1? CNPS List 1B.2	High (suitable habitat occurs)
<i>Astragalus leucolobus</i> Bear Valley woollypod	Perennial herb; open or disturbed soils, pine forests and sagebrush scrub, about 5600-8800 ft. elev.; San Gabriel Mtns to Santa Rosa Mtns	May - July	Fed: none Calif: S 2.2 CNPS List 1B.2	Occurs
<i>Calochortus palmeri</i> vars. <i>palmeri</i> and <i>munzii</i> Palmer's & Munz's mariposa lilies	Bulb; meadows or seasonally moist sites; about 3300 - 7200 ft. elev.; var. <i>palmeri</i> occurs S Coast & Transverse Ranges, reported but not verified San Jacinto Mtns; var. <i>munzii</i> endemic to San Jacintos, reported but not verified in San Bernardinios	May - July	Fed: none CNPS List 1B.2  var <i>palmeri</i> : Calif: S 2.1 var. <i>munzii</i> : Calif: S 1.2	Moderate (marginally suitable habitat)

**APPENDIX 2:** Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Carex occidentalis</i> Western sedge	Rhizomatous perennial; meadows & seeps; San Bernardino Mtns, White Mtns, scattered in western states; about 6200 - 10,300 ft. elev.	June - Aug	Fed: none Calif: S2S3 CNPS List 2.3	Moderate (marginal habitat)
<i>Castilleja cinerea</i> Ash-gray Indian paintbrush	Perennial herb; pebble plains, dry meadows, about 5900 to 9100 ft. elev.; partially parasitic usually on matting buckwheats; San Bernardino Mtns endemic	May - August	Fed: THR Calif: S2.2 CNPS List 1B.2	Occurs (field survey and CNDDDB report)
<i>Castilleja lasiorhyncha</i> ( <i>Orthocarpus lasiorhynchus</i> ) San Bernardino Mountain owl's clover	Annual; meadows, streamsides, seeps, etc., about 4200-7800 ft. elev.; San Bernardino Mtns. and (historically) San Jacinto Mtns.; reports from San Diego Co. unconfirmed	June - Aug	Fed: none Calif: S2.2 CNPS List 1B.2	Moderate (marginal habitat)
<i>Castilleja applegatei</i> ssp. <i>martinii</i> × <i>C. angustifolia</i> (= <i>C. montigena</i> , <i>C. martinii</i> var. <i>ewanii</i> ) Heckard's paintbrush	Perennial herb; conifer forest; San Bernardino Mountains endemic (treated as a species by CNPS but considered a hybrid by Chuang & Heckard in Jepson Manual)	March - July	Fed: none Calif: S3.3 CNPS List 4.3	Occurs (Jeffrey pine forest)
<i>Dryopteris filix-mas</i> Male fern	Perennial herb; widespread in N hemisphere, esp. at high latitudes; only two reports in Calif., incl. Holcomb Valley	July - Sept.	Fed: none Calif: S 1.3 CNPS List 2.3	Low (local rarity)
<i>Dudleya abramsii</i> ssp. <i>affinis</i> San Bernardino Mts. dudleya	Perennial herb, pebble plains & rock outcrops (often carbonate); pinyon woodland, open pine forests, about 5200-8500 ft. elev.; San Bernardino Mtns endemic	April - June	Fed: none Calif: S 2.2 CNPS: List 1B.2	Moderate (marginal habitat)
<i>Eriogonum foliosum</i> ( <i>E. evanidum</i> ) Leafy buckwheat	Annual; sandy soil, woodlands or shrublands; about 3900-7200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.; may be extinct in Calif.	July - Oct.	Fed: none Calif: SH CNPS List 1B.2	Minimal (presumed extinct, local rarity)
<i>Eriogonum kennedyi</i> var. <i>austromontanum</i> Southern mountain buckwheat	Matting woody perennial; pebble plains and similar soils, about 5800 - 7800 ft. elev.; nearly endemic to Big Bear area, also reported at Mt. Pinos	July - August	Fed: <b>THR</b> Calif: S2.2 CNPS: List 1B.2	Apparent introgression w/ Wright's buckwheat (see text)
<i>Eriogonum microthecum</i> var. <i>lacus-ursi</i> Bear Lake buckwheat	Subshrub; montane forests and shrublands; only known occurrence at Big Bear Lake shore ca. 7200 ft. elev.	July - Sept.	Fed: none Calif: S 1 CNPS List 1B.1	Minimal (field survey)
<i>Eriophyllum lanatum</i> var. <i>obovatum</i> Southern Sierra woolly sunflower	Perennial herb; open montane coniferous forests, 4200-8200 ft. elev.; S Sierra Nevada and western San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)



**APPENDIX 2:** Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Galium jepsonii</i> ( <i>G. angustifolium</i> var. <i>subglabrum</i> ) Jepson's bedstraw	Perennial herb; sandy or gravelly soils, montane conifer forest, 6500-8100 ft. elev.; San Gabriel and San Bernardino Mtns	July - August	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Galium johnstonii</i> ( <i>G. angustifolium</i> var. <i>pinetorum</i> ) Johnston's bedstraw	Perennial herb, dry slopes, chaparral, lower montane forest, pinyon and juniper woodland; about 4000-7600 ft. elev.; San Bernardino, San Gabriel, maybe San Jacinto mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Low-moderate (suitable habitat occurs; margin of elev. range)
<i>Gilia leptantha</i> ssp. <i>leptantha</i> San Bernardino Mtn. <i>gilia</i>	Annual; sandy or gravelly soils, open pine forest; endemic to upper Santa Ana Riv. watershed, San Bernardino Mtns., about 5000 to 7700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (probably outside geogr. range)
<i>Heuchera hirsutissima</i> Shaggy-haired alum root	Perennial herbs; rocky outcrops, cliffs, slopes; montane forest or alpine boulderfields; above about 4800 ft. elev.; <i>H. hirsutissima</i> is endemic to San Jacinto and Santa Rosa Mtns (unconfirmed from San Bernardino Mtns); <i>H. parishii</i> endemic to San Bernardino Mtns	May - July	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (poorly suitable habitat)
<i>Heuchera parishii</i> Parish's alumroot				
<i>Hulsea vestita</i> ssp. <i>parryi</i> Parry's sunflower	Perennial herb; gen. conifer forests, on loose eroding soil and talus; San Bernardino Mtns and Little San Bern. Mtns; about 5500-9500 ft. elev.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	Low-moderate (marginal habitat)
<i>Ivesia argyrocoma</i> Silver-haired ivesia	Perennial herb; pebble plains, seasonal meadows, drainages; about 4900-8800 ft. elev.; San Bernardino Mtns and a long-disjunct site in Baja Calif mtns	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Occurs (field survey & NDDB record)
<i>Juncus duranii</i> Duran's rush	Perennial herb; meadows, seeps, etc., montane forest, about 5800-9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	July - August	Fed: none USFS: none Calif: S 3.3 CNPS: List 4.3	Low (masrginal habitat occurs)
<i>Lewisia brachycalyx</i> Short-sepaed lewisia	Perennial herb; wet meadows, mesic forest openings, about 4500-7600 ft. elev.; San Bernardino Mtns to Baja Calif, Utah, New Mexico	May - June	Fed: none Calif: S3.2 CNPS: List 2.2	Low-Moderate (marginal habitat)
<i>Lilium parryi</i> Lemon lily	Bulb; meadows and streambanks, about 4200 - 8600 ft. elev.; mtns of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B.2	Low (marginal habitat)
<i>Linanthus killipii</i> Baldwin Lake linanthus	Annual; pebble plains, alkaline meadows, forest openings, about 5500-7900 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.1 CNPS: List 1B.2	High (suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Mimulus exiguus</i> San Bernardino Mountain monkeyflower	Annual; open, seasonally moist meadows, seeps, drainages, about 5900 - 7600 ft. elev.; San Bernardino Mtns. and high mtns of Baja Calif.	June - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
<i>Mimulus purpureus</i> Purple monkeyflower	Annual; meadow edges, forests, drainages, seeps, about 6200 - 7600 ft. elev.; San Bernardino Mtns and high mtns of Baja Calif.	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
<i>Navarretia peninsularis</i> Baja navarretia	Annual herb; open, seasonally wet places in coniferous forests, about 4900 -7600 ft. elev.; mtns of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low (small patches of marginal habitat)
<i>Oxytheca caryophylloides</i> Chickweed oxytheca	Annual; sandy soils in conifer forests, 3900-8500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mtns	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Perideridia parishii</i> ssp. <i>parishii</i> Parish's yampah	Perennial herb; meadows, moist areas in conifer forest, about 4800 - 9900 ft. elev.; San Bernardino Mtns and (disjunct) AZ, Nevada, New Mexico	June - August	Fed: none Calif: S2.2? CNPS: List 2.2	Low - moderate (marginal habitat)
<i>Phacelia exilis</i> ( <i>P. mohavensis</i> var. <i>exilis</i> ) Transverse Range phacelia	Annual; sandy or gravelly soils, forest openings, meadows, pebble plains, about 3600 - 8900 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Phacelia mohavensis</i> Mojave phacelia	Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest, about 4500-8100 ft. elev.; San Gabriel & San Bernardino Mtns.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Phlox dolichantha</i> Bear Valley phlox	Perennial herb; montane forest and pebble plains; about 6000 - 9800 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
<i>Poa atropurpurea</i> San Bernardino bluegrass	Open, flat meadows, about 6700 - 7500 ft. elev. in the San Bernardinos; endemic to San Bernardino Mtns and San Diego Co. (Palomar and Laguna Mtns where it ranges down to about 4400 ft. elev.)	May - June	Fed: <b>END</b> Calif: S2.2 CNPS: List 1B.2	Low (habitat marginal at best)
<i>Potentilla glandulosa</i> ssp. <i>ewanii</i> Ewan's cinquefoil	Perennial herb; mesic conifer forest, about 6200-7900 ft. elev.; nearly endemic to San Gabriel Mtns., but also reported from Fawnskin area, San Bernardino Mtns.	June - July	Fed: none Calif: S 1.3 CNPS List 1B.3	Low (field survey)
<i>Pyrrocoma uniflora</i> ssp. <i>gossypina</i> ( <i>Haplopappus uniflorus</i> ssp. <i>gossypinus</i> ) Bear Valley pyrrocoma	Perennial herb; meadows (usually alkaline), pebble plains, about 5200 - 7600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low - moderate (marginally suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Rupertia rigida</i> ( <i>Psoralea rigida</i> ) Parish's rupertia	Perennial herb; chaparral, forests, and woodlands, about 2300-8200 ft. elev.; San Bernardino Mtns, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Selaginella asprella</i> Bluish spike-moss	Herb; rocks, crevices, & rocky soils, dry sites in conifer forests, about 5200-8800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4.3	Low (marginal habitat)
<i>Senecio bernardinus</i> ( <i>Packera bernardinoa</i> ) San Bernardino butterweed	Perennial herb; dry meadows (incl. alkaline), about 5900-7600 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	Low (marginally suitable habitat)
<i>Senecio ionophyllum</i> Tehachapi ragwort	Perennial herb; crevices, rocky places in dry conifer forest, about 4800-8900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Moderate (suitable habitat)
<i>Sidalcea hickmanii</i> ssp. <i>parishii</i> Parish's checkerbloom	Perennial herb; chaparral, oak shrubland or woodland, pine forest; San Bernardino Mtns. and a few Santa Barbara Co. sites, about 3200 - 6000 ft. elev.	June - August	Fed: none CA: <b>Rare</b> S 1.2 CNPS: List 1B.2	Minimal (marginal habitat, above elev. range)
<i>Sidalcea pedata</i> Bird's foot checkerbloom	Perennial herb; meadows (freshwater or alkaline clay), sometimes streambanks, about 5200-8200 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: <b>END</b> Calif: <b>END</b> , 1.1 CNPS: List 1B.1	Low (habitat marginal at best)
<i>Sphenopholis obtusata</i> Prairie wedge grass	Perennial grass; riparian woodlands, meadows, streambanks; about 1000 - 6600 ft. elev.; few scattered locns in Calif. but widespread in N America	April - July	Fed: none Calif: S2.2 CNPS: List 2.2	Low (upper margin elev. range; poor habitat)
<i>Streptanthus bernardinus</i> Laguna Mountains jewelflower	Perennial herb; chaparral, hardwood & conifer forest, about 3900-8100 ft. elev.; mtns of S Calif. (gen. W half of San Bernardino Mtns)	June - July	Fed: none Calif: S 3.3 CNPS: List 4.3	Moderate (margin of geogr. range)
<i>Streptanthus campestris</i> Southern jewelflower	Perennial herb; shrublands, forests, woodlands, often rocky sites, about 2900 -7600 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S 2.3 CNPS: List 1B.3	High (suitable habitat occurs)
<i>Swertia neglecta</i> ( <i>Frasera neglecta</i> ) Pine green-gentian	Perennial herb; conifer forests and pinyon woodland., about 4600-8200 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Taraxacum californicum</i> California dandelion	Perennial herb; wet meadows, about 5300 - 9200 ft. elev.; San Bernardino Mtns endemic	May - Aug	Fed: <b>END</b> Calif: S2.1 CNPS: List 1B.2	Low - moderate (suitable habitat occurs)

**APPENDIX 2:** Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Thelypodium stenopetalum</i> Slender-petaled thelypodium	Perennial herb; meadows (mesic, usually alkaline clay), about 5200 - 8200 ft. elev.; endemic to Big Bear and Holcomb Valleys	May - Aug	Fed: <b>END</b> Calif: <b>END</b> , 1.1 CNPS: List 1B.1	Minimal (no alkaline meadow habitat)
<i>Trichostema micranthum</i> Small-flowered bluecurls	Annual; dry margins of lakes, meadows, and streams, 5000-7600 ft. elev., San Bernardino Mtns and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
<i>Viola pinetorum</i> ssp. <i>grisea</i> Grey-leaved violet	Perennial herb; montane forests, about 4900 -11,200 ft. elev.; S Sierra Nevada and reported San Bernardino Mtns (CNPS but no other source)	April - July	Fed: none Calif: S 1.3 CNPS: List 1B.3	Low (suitable habitat occurs; may be outside geogr. range)

General references: CDFG 2007a, 2007b; CNPS 2007; Hickman (ed.) 1993; Munz 1974; Sanders et al. 1995; Tibor 2001, US Fish and Wildlife Service 2006.

**Conservation Status**

**Federal designations:** (federal Endangered Species Act, US Fish and Wildlife Service). Until 1996, FWS maintained a list of "category 2 candidates," described as species of concern, but with insufficient data to support listing. This list is no longer maintained and FWS has no "SOC" category.

END: Federally listed, endangered.

THR: Federally listed, threatened.

Candidate: Sufficient data are available to support federal listing, but not yet listed.

Proposed: Formally proposed for federal status shown.

**State designations:** (California Endangered Species Act, California Dept. of Fish and Game)

END: State listed, endangered.

THR: State listed, threatened.

RARE: State listed as rare (applied only to certain plants).

CSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.

FP: Fully protected. May not be taken or possessed without permit from CDFG.

**CDF&G Natural Diversity Data Base Designations:** Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.

S1.1: Very threatened

S1.2: Threatened

S1.3: No current threats known

S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).

S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).

S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.

S5: Demonstrably secure or ineradicable in California. No threat rank.

SH: All California occurrences "historical" (i.e., no records in > 20 years).

## APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

**California Native Plant Society (CNPS) designations.** Note: According to CNPS (Tibor, ed., 2001 p. 54-55), plants on Lists 1A, 1B, and 2 meet definitions as threatened or endangered and "are eligible" for state listing. That interpretation of the state Endangered Species Act is not in general use.

List 1A: Plants presumed extinct in California.

List 1B: Plants rare and endangered in California and throughout their range.

List 2: Plants rare, threatened or endangered in California but more common elsewhere in their range.

List 3: Plants about which we need more information; a review list.

List 4: Plants of limited distribution; a watch list.

### **CNPS Threat Rank:**

- .1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- .2 Fairly endangered in California (20-80% occurrences threatened)
- .3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

**Watch Lists:** Several public and private conservation organizations maintain lists of wildlife species of concern. See CDFG 2007 introductory section for further explanations and references.

ABC: American Bird Conservancy Green List

Audubon: National Audubon Society Watch List

IUCN: World Conservation Union Species Survival Commission Red List

**Definitions of occurrence probability:** Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.

*Occurs:* Observed on the site by qualified biologists.

*Expected:* Not observed or recorded on the site, but very likely present during at least a portion of the year.

*High:* Habitat is a type often utilized by the species and the site is within the known range of the species.

*Moderate:* Site is within the known range of the species and habitat on the site is a type occasionally used.

*Low:* Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.

*Minimal:* No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.

*Unknown:* No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

**Appendix 3:  
Species List**

**Appendix 3: Species list**

<b>Latin Name</b>	<b>Common Name</b>		
<b>CUPRESSACEAE</b>			
<b>CYPRESS FAMILY</b>			
<i>Calocedrus decurrens</i>	Incense cedar	Occas. / forest	
<i>Juniperus occidentalis</i>	Western juniper	Comm. / forest	
<b>PINACEAE</b>			
<b>PINE FAMILY</b>			
<i>Abies concolor</i>	White fir	Occas. / forest	
<i>Pinus jeffreyi</i>	Jeffrey pine	Comm. / forest	
<i>Pinus monophylla</i>	Pinyon pine	Occas. / forest	
<b>APIACEAE</b>			
<b>CELERY FAMILY</b>			
<i>Lomatium nevadense</i>	Nevada lomatium	Uncomm. / forest	11669
<i>Tauschia parishii</i>	Parish tauschia	Scarce / open places	11668
<b>ASTERACEAE</b>			
<b>ASTER FAMILY</b>			
<i>Achillia millefolium</i>	California yarrow	Comm. / esp. mesic sites	
<i>Agoseris retrorsa</i>	Spear-leaved agoseris	Occas. / throughout	
<i>Antennaria dimorpha</i>	Low everlasting	Comm. / pebble plains	
<i>Artemisia dracunculus</i>	Tarragon	Occas. / esp. near road, lakeshore	
<i>Artemisia ludoviciana</i>	Western mugwort	Occas. / open places, washes	
<i>Artemisia tridentata</i>	Great Basin sagebrush	Comm. / open forest	
<i>Aster frondosus</i>	Short-rayed alkali aster	Occas.-comm. / near shore	
<i>Chrysothamnus nauseosus</i>	Common rabbitbrush	Occas. / throughout	
<i>Chrysothamnus viscidiflorus</i>	Curlleaf rabbitbrush	Occas.-comm. / throughout	
<i>Cirsium occidentale</i> var. <i>californicum</i>	California thistle	Uncomm. / open sites	
* <i>Cirsium vulgare</i>	Bull thistle	Occas. / near shore	
<i>Erigeron breweri</i>	Brewer's daisy	Occas. / forest	
<i>Erigeron divergens</i>	Diffuse daisy	Comm. / gen. open places	11667
<i>Eriophyllum confertiflorum</i>	Golden yarrow	Comm. / ± throughout	
<i>Gnaphalium canescens</i>	Perennial cudweed	Uncomm. / gen. open places	
* <i>Gnaphalium luteo-album</i>	Pearly everlasting	Occas. / roadside, shoreline	
<i>Hymenopappus filifolius</i>	Columbia cutleaf	Uncomm. / open forest	
* <i>Lactuca serriola</i>	Prickly lettuce	Occas. / mostly roadside	
<i>Lessingia filaginifolia</i> ( <i>Corethrogyne filaginifolia</i> )	Chaparral aster	Occas. / open forest	
<i>Madia elegans</i>	Elegant tarplant	Occas. / forest	
* <i>Senecio vulgaris</i>	Common groundsel	Uncomm. / gen. roadside	
<i>Solidago californica</i>	Calif. goldenrod	Occas. / mesic sites	
* <i>Sonchus oleraceus</i>	Common sow thistle	Occas. / near shore	
* <i>Taraxacum officinale</i>	Common dandelion	Occas. / roadside, shoreline	
<i>Tetradymia comosa</i>	Hairy horsebrush	Occas. / open forest	
* <i>Tragopogon dubius</i>	Oyster plant, salsify	Occas. / roadside, forest	
<b>BORAGINACEAE</b>			
<b>BORAGE FAMILY</b>			
<i>Cryptantha micrantha</i>	Purple root cryptantha	Occas. / open places	
<i>Cryptantha simulans</i>	Popcorn flower	Scarce / open places	11670
<b>BRASSICACEAE</b>			
<b>MUSTARD FAMILY</b>			
<i>Arabis holboellii</i> (?)	Holboell's rock-cress	Occas. / open forest	
** <i>Arabis parishii</i>	Parish's rock-cress	Occas. / pebble plains	11665
<i>Caulanthus major</i>	Slender wild-cabbage	Occas. / forest	
<i>Descurainia incisa</i> ( <i>D. richardsonii</i> )	Mountain tansy mustard	Uncomm. / near road	

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season. Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), Munz (1974), and other regional references. Taxonomy and nomenclature generally follow Hickman. Some plants were collected as vouchers (see collection numbers at right) and will be donated to the Herbaria at Rancho Santa Ana Botanic Garden or UC Riverside.

**Appendix 3: Species list**

BRASSICACEAE, cont.			
<i>Descurainia pinnata</i>	Tansy mustard	Occas. / mostly open forest	
<i>Erysimum capitatum</i>	Douglas wallflower	Occas. / ±throughout	
* <i>Lepidium virginicum</i> v. <i>pubescens</i>	Wild peppergrass	Occas. / mostly roadside, shoreline	
* <i>Sisymbrium altissimum</i>	Tumble mustard	Occas. / roadside	
CACTACEAE			
<i>Opuntia basilaris</i> var. <i>basilaris</i>	CACTUS FAMILY		
	Common beavertail cactus	Uncomm. / open forest	
CAPRIFOLIACEAE			
<i>Symphoricarpos rotundifolius</i> var. <i>parishii</i>	HONEYSUCKLE FAMILY		
	Parish snowberry	Occas. / shaded forest	
CARYOPHYLLACEAE			
<i>Silene verecunda</i> ssp. <i>platyota</i>	CARNATION FAMILY		
	Cuyamaca campion	Occas. / forest	
CHENOPODIACEAE			
* <i>Chenopodium album</i> (?)	GOOSEFOOT FAMILY		
* <i>Salsola tragus</i>	Common goosefoot	Occas. / throughout	
	Russian thistle, tumbleweed	Occas. / mostly roadside	
CONVOLVULACEAE			
<i>Calystegia malacophylla</i> ssp. <i>fulcrata</i> ( <i>C. fulcrata</i> )	MORNING GLORY FAMILY		
	Morning glory	Occas. / throughout	
ERICACEAE			
<i>Arctostaphylos patula</i>	MANZANITA FAMILY		
	Greenleaf manzanita	Occas.-comm. / forest	
EUPHORBIACEAE			
<i>Chamaesyce albomarginata</i>	SPURGE FAMILY		
<i>Euphorbia palmeri</i>	Rattlesnake spurge	Occas. / open forest	
	Wood spurge	Occas. / uplands	
FABACEAE			
<i>Amorpha californica</i>	PEA FAMILY		
** <i>Astragalus leucolobus</i>	Calif. false indigo	Occas. / mesic forest	
<i>Astragalus douglasii</i>	Bear Valley woollypod	Comm. / pebble plains	11705
<i>Lotus argyraeus</i>	Douglas rattleweed	Uncomm. / open places	
<i>Lotus nevadensis</i>	Silver lotus	Occas. / open forest	
<i>Lupinus</i> cf. <i>breweri</i>	Nevada lotus	Comm. / open places	
<i>Lupinus excubitus</i> var. <i>austromontanus</i>	Silver mat lupine	Comm. / pebble plains, etc.	
<i>Lupinus lepidus</i> v. <i>confertus</i>	Southern mountain lupine	Occas. / ±throughout	11666
* <i>Medicago lupulina</i>	Prairie lupine	Occas. / lakeshore	
* <i>Melilotus alba</i>	Black medick	Uncomm. / near lakeshore	
	White sweet-clover	Occas.-comm. / roadsides, shore	
FAGACEAE			
<i>Quercus kelloggii</i>	OAK FAMILY		
	California black oak	Comm. / forest	
GERANIACEAE			
* <i>Erodium cicutarium</i>	GERANIUM FAMILY		
	Red-stemmed filaree	Occas.-comm. / roadsides, etc.	
HYDROPHYLLACEAE			
<i>Eridictyon trichocalyx</i>	WATERLEAF FAMILY		
<i>Phacelia distans</i> (?)	Yerba santa	Occas. / open forest	
<i>Phacelia imbricata</i>	Common phacelia	Uncomm. / open forest	
	Broad-sepaled phacelia	Uncomm. / open forest	
LAMIACEAE			
<i>Monardella linoidea</i> (?) (or <i>M. odoratissima</i> )	MINT FAMILY		
<i>Scutellaria siphocampyloides</i> ( <i>S. austinae</i> )	Flax-leaved monardella	Occas. / forest	
	Austin's skullcap	Uncomm. / mesic forest	
LOASACEAE			
<i>Mentzelia</i> sp.	STICK-LEAF FAMILY		
	Unid. stick-leaf	Uncomm. / uplands	11674
MALVACEAE			
* <i>Malva parviflora</i>	MALLOW FAMILY		
	Cheeseweed	Occas. / mostly lakeshore	
ONAGRACEAE			
<i>Clarkia</i> sp.	EVENING PRIMROSE FAMILY		
	Unid. annual clarkia	Uncomm. / shaded forest	



**Appendix 3: Species list**

<b>ONAGRACEAE (cont.)</b>			
<i>Epilobium brachycarpum</i> ( <i>E. paniculatum</i> )	Summer cottonweed	Occas.-comm. upland margins	
<i>Epilobium ciliatum</i>	Willow-herb	Occas. / mostly lakeshore	
<i>Gaypohytum sp.</i>	Unid. gayophytum	Comm. / open forest	
<b>POLEMONIACEAE PHLOX FAMILY</b>			
<i>Gilia latiflora</i> (?)	Broad-flowered gilia	Uncomm. / open forest	
<i>Gilia modocensis</i>	Modoc gilia	Occas. / open places	11,659
<i>Eriastrum densifolium</i> <i>ssp. densifolium</i>	Mojave woolly-star	Occas. / open forest	
<i>Eriastrum sapphirinum</i>	Sapphire woollystar	Occas. / open forest	
<i>Linanthus breviculus</i>	Mojave linanthus	Comm. / open forest	
<i>Phlox gracilis</i>	Slender phlox	Comm. / open places	11660
<b>POLYGONACEAE BUCKWHEAT FAMILY</b>			
<i>Eriogonum davidsonii</i> (= <i>E. molestum</i> var. <i>davidsonii</i> )	Davidson buckwheat	Occas. / open forest	
** <i>Eriogonum kennedyi</i> var. <i>austromontanum</i>	Southern mountain buckwheat	Uncomm., pebble plain, intergrade w/ <i>E. wrightii</i> ?	11760
<i>Eriogonum wrightii</i> ssp. <i>subscaposum</i>	Wright's buckwheat	Comm. & characteristic / pebble plains	
<i>Eriogonum umbellatum</i> v. <i>munzii</i>	Munz sulfur buckwheat	Occas. / open forest	
* <i>Polygonum arenastrum</i>	Common knotweed	Occas. / roadside, lake shore	
* <i>Rumex crispus</i>	Curly dock	Occas. / mostly lakeshore	
<i>Rumex salicifolius</i>	Willow dock	Uncomm. / near lakeshore	
<b>PORTULACACEAE PURSLANE FAMILY</b>			
<i>Lewisia rediviva</i>	Bitter root	Occas.-comm. / pebble plains	
<b>RANUNCULACEAE BUTTERCUP FAMILY</b>			
<i>Delphinium parishii</i> (?)	Parish larkspur	Occas. / forest	
* <i>Ranunculus sceleratus</i>	Cursed buttercup	Occas. / lakeshore	11656
<b>RHAMNACEAE BUCKTHORN FAMILY</b>			
<i>Ceanothus cordulatus</i>	Mountain whitethorn	Occas. / open forest	
<i>Ceanothus greggii</i>	Cupleaf ceanothus	Uncomm. / open forest	
<i>Ceanothus integerrimus</i>	Deerbrush	Occas. / forest	
<b>ROSACEAE ROSE FAMILY</b>			
<i>Amelanchier utahensis</i>	Service berry	Comm. / ± throughout	
<i>Cercocarpus betuloides</i>	Birch-leaf mountain mahogan	Uncomm.	
<i>Cercocarpus ledifolius</i>	Curleaf mountain mahogany	Comm. / ± throughout	
<i>Horkelia rydbergii</i> ( <i>H. bolanderi</i> s. <i>parryi</i> )	Transverse range horkelia	Occas. / mostly near lake	
** <i>Ivesia argyrocoma</i>	Silver-haired ivesia	locally comm. / pebble pl.	11658
<i>Potentilla anserina</i>	Silverweed	Comm. / lakeshore	
<i>Potentilla biennis</i>	Biennial cinquefoil	Comm. / lakeshore	11671
<i>Potentilla gracilis</i>	Slender cinquefoil	Occas. / mesic places	
<i>Potentilla wheeleri</i>	Wheeler cinquefoil	Scarce / near lakeshore	11673
<b>RUBIACEAE COFFEE FAMILY</b>			
* <i>Galium aparine</i>	Goose grass	Uncomm. / shaded forest	
<i>Galium parishii</i>	Parish bedstraw	Occas. / forest	
<b>SALICACEAE WILLOW FAMILY</b>			
<i>Populus balsamifera trichocarpa</i>	Black cottonwood	Seedlings only / lakeshore	
<i>Salix laevigata</i> (?)	Red willow	Uncomm. / lakeshore	
<i>Salix lasiolepis</i> (?)	Arroyo willow	Comm. / lakeshore	
<b>SCROPHULARIACEAE SNAPDRAGON FAMILY</b>			
** <i>Castilleja cinera</i>	Ash-gray paintbrush	Localized / pebble plains	11657
** <i>Castilleja montigena</i> ( <i>C. applegatei</i> <i>ssp. martinii</i> )	Heckerd's paintbrush	Occas. / forest	

**Appendix 3: Species list**

SCROPHULARIACEAE, cont.			
<i>Collinsia parviflora</i>	Small-flowered blue-eyed Mar	Comm., patchy / peb. pl.	11661
<i>Limosella acaulis</i>	Mudwort	Comm.-abund. / wet lakesho	11655
<i>Mimulus guttatus</i>	Seep monkeyflower	Occas. / lakeshore	
<i>Pedicularis semibarbata</i>	Pine-woods lousewort	Occas. / forest	11664
<i>Penstemon eatonii</i>	Eaton firecracker	Occas. / forest	
* <i>Verbascum thapsus</i>	Common muellin	Occas. / throughout	
SOLANACEAE			
<i>Solanum xanti</i>	NIGHTSHADE FAMILY		
	Chaparral nightshade	Uncomm. / forest	
STERCULIACEAE			
<i>Fremontodendron californicum</i>	CACAO FAMILY		
	Flannel bush	Occas.-comm. / open forest	
TAMARICACEAE			
<i>Tamarix ramosissima</i>	TAMARISK FAMILY		
	Mediterranean tamarisk	Occas. / lakeshore	
URTICACEAE			
<i>Urtica dioica ssp. holosericea</i>	NETTLE FAMILY		
	Stinging nettle	Occas. / lakeshore	
VIOLACEAE			
<i>Viola douglasii</i>	VIOLET FAMILY		
	Douglas violet	Occas. / pebble plains	11663
<i>Viola purpurea</i>		Occas. / throughout	11662
VISCACEAE			
<i>Arceuthobium campylopodum</i>	MISTLETOE FAMILY		
	Dwarf mistletoe	Uncomm. / on yellow pines	
CYPERACEAE			
<i>Carex athrostachya</i>	SEDGE FAMILY		
<i>Carex sp.</i>	Slender-beaked sedge	Occas. / near lake	
	Unid. sedge	Uncomm. / near lakeshore	11671
JUNCACEAE			
<i>Juncus arcticus (incl. vars. balticus and mexicanus)</i>	RUSH FAMILY		
	Wire-grass	Occas.-comm. / mesic areas	
LILIACEAE			
<i>Allium parryi</i>	LILY FAMILY		
<i>Calochortus kennedyi</i>	Parry's onion	Occas. / mostly pebble plains	
	Kennedy's mariposa lily	Uncomm. / open forest	
POACEAE			
<i>Agrostis sp.</i>	GRASS FAMILY		
<i>Alopecurus aequalis</i>	Unid. bentgrass	Occas. / lakeshore	
<i>Bromus carinatus</i>	Short-awn foxtail	Comm., patchy / near shore	
<i>Bromus orcuttianus (?)</i>	California brome	Occas. / uplands, ±throughout	
* <i>Bromus tectorum</i>	Orcutt brome	Uncomm. / mesic forest	
<i>Elymus elymoides</i>	Cheat grass	Comm. / ± throughout	
( <i>Sitanion hystrix v. hystrix</i> )	Bottlebrush squirreltail	Occas. / ±throughout	
<i>Elymus glaucus</i>	Blue wild-rye	Occas. / ± throughout	
<i>Hordeum jubatum</i>	Foxtail barley	Uncomm. / mostly near lake	
* <i>Koeleria macrantha</i>	Junegrass	Occas. / mesic forest, uplands	
<i>Melica stricta</i>	Nodding melic	Uncomm. patchy, uplands	
<i>Muhlenbergia rigens</i>	Deergrass	Occas. / throughout	
<i>Poa fendleriana</i>	Fendler bluegrass	Occas.-comm. / forest	
<i>Poa secunda</i>	Nodding bluegrass	Comm. / ± throughout	
* <i>Polypogon monspeliensis</i>	Rabbitfoot grass	Occas.-comm. / near shore	
<i>Pucinellia nuttalliana</i>	Alkali grass	Uncomm. / low-lying mesic site	
<i>Stipa coronata ssp. depauperata</i>	Parish needlegrass	Occas. / mostly open forest	
( <i>Achnatherum parishii</i> )			
<i>Stipa lettermannii</i>	Letterman's needlegrass	Occas. / forest	
<i>Vulpia microstachys</i>	Annual fescue	Uncomm. patchy / upland	
( <i>Festuca microstachys, F. reflexa, F. pacifica, F. confusa</i> )			

**Attachment 1:  
California Natural Diversity Data Base Query Results**

California Department of Fish and Game  
 Natural Diversity Database  
 Selected Elements by Scientific Name - Portrait  
 USGS 7½' quads: Fawnskin, Big Bear City, Big Bear Lake, Butler Pk, Keller Peak, and Moonridge

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 <i>Accipiter cooperii</i> Cooper's hawk	ABNKC12040			G5	S3	SC
2 <i>Antennaria marginata</i> white-margined everlasting	PDA00H1G0			G4G5	S1.3	2.3
3 <i>Arabis dispar</i> pinyon rock cress	PDBRA060F0			G3	S2.3	2.3
4 <i>Arabis parishii</i> Parish's rock cress	PDBRA061C0			G2	S2.1	1B.2
5 <i>Arabis shockleyi</i> Shockley's rock cress	PDBRA061V0			G3	S2.2	2.2
6 <i>Arenaria lanuginosa ssp. saxosa</i> rock sandwort	PDCAR040E4			G5T5	S1.3	2.3
7 <i>Arenaria ursina</i> Big Bear Valley sandwort	PDCAR040R0	Threatened		G2	S2.1	1B.2
8 <i>Astragalus albens</i> Cushenbury milk-vetch	PDFAB0F0A0	Endangered		G1	S1.1	1B.1
9 <i>Astragalus lentiginosus var. sierrae</i> Big Bear Valley milk-vetch	PDFAB0FB9L			G5T1	S1?	1B.2
10 <i>Astragalus leucolobus</i> Big Bear Valley woollypod	PDFAB0F4T0			G2	S2.2	1B.2
11 <i>Astragalus tricarinatus</i> triple-ribbed milk-vetch	PDFAB0F920	Endangered		G1	S1.2	1B.2
12 <i>Atriplex parishii</i> Parish's brittlescale	PDCHE041D0			G1G2	S1.1	1B.1
13 <i>Botrychium crenulatum</i> scalloped moonwort	PPOPH010L0			G3	S2.2	2.2
14 <i>Calochortus palmeri var. palmeri</i> Palmer's mariposa lily	PMLIL0D122			G2T2	S2.1	1B.2
15 <i>Calochortus plummerae</i> Plummer's mariposa lily	PMLIL0D150			G3	S3.2	1B.2
16 <i>Calochortus striatus</i> alkali mariposa lily	PMLIL0D190			G2	S2.2	1B.2
17 <i>Castilleja cinerea</i> ash-gray Indian paintbrush	PDSCR0D0H0	Threatened		G2	S2.2	1B.2
18 <i>Castilleja lasiorhyncha</i> San Bernardino Mountains owl's-clover	PDSCR0D410			G2	S2.2	1B.2
19 <i>Chaetodipus fallax pallidus</i> pallid San Diego pocket mouse	AMAFD05032			G5T3	S3	SC
20 <i>Charina trivirgata</i> rosy boa	ARADA02010			G4G5	S3S4	
21 <i>Charina umbratica</i> southern rubber boa	ARADA01011		Threatened	G5T2T3	S2S3	
22 <i>Corynorhinus townsendii</i> Townsend's big-eared bat	AMACC08010			G4T3T4	S2S3	SC
23 <i>Dryopteris filix-mas</i> male fern	PPDRY0A0B0			G5	S1.3	2.3

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Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24 <i>Dudleya abramsii</i> ssp. <i>affinis</i> San Bernardino Mountains dudleya	PDCRA04013			G3T2	S2.2	1B.2
25 <i>Empidonax traillii extimus</i> southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	G5T1T2	S1	
26 <i>Erigeron parishii</i> Parish's daisy	PDAST3M310	Threatened		G2	S2.1	1B.1
27 <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> southern mountain buckwheat	PDPGN083B2	Threatened		G4T2	S2.2	1B.2
28 <i>Eriogonum microthecum</i> var. <i>lacus-ursi</i> Bear Lake buckwheat	PDPGN083WF			G5T1	S1.1	1B.1
29 <i>Eriogonum ovalifolium</i> var. <i>vineum</i> Cushenbury buckwheat	PDPGN084F8	Endangered		G5T1	S1.1	1B.1
30 <i>Euchloe hyantis andrewsi</i> Andrew's marble butterfly	IILEPA5032			G3G4T1	S1	
31 <i>Gasterosteus aculeatus willamsoni</i> unarmored threespine stickleback	AFCPA03011	Endangered	Endangered	G5T1	S1	
32 <i>Gentiana fremontii</i> moss gentian	PDGEN060Y0			G4	S2.3	2.3
33 <i>Gila orcuttii</i> arroyo chub	AFCJB13120			G2	S2	SC
34 <i>Gilia leptantha</i> ssp. <i>leptantha</i> San Bernardino gilia	PDPLM040W1			G4T2	S2.3	1B.3
35 <i>Glaucomys sabrinus californicus</i> San Bernardino flying squirrel	AMAFB09021			G5T2T3	S2S3	SC
36 <i>Haliaeetus leucocephalus</i> bald eagle	ABNKC10010	Threatened	Endangered	G5	S2	
37 <i>Helianthus nuttallii</i> ssp. <i>parishii</i> Los Angeles sunflower	PDAST4N102			G5TH	S1.1	1A
38 <i>Heuchera parishii</i> Parish's alumroot	PDSAX0E0S0			G2	S2.3	1B.3
39 <i>Horkelia wilderae</i> Barton Flats horkelia	PDROS0W0J0			G1	S1.1	1B.1
40 <i>Hydroporus simplex</i> simple hydroporus diving beetle	IICOL55050			G1?	S1?	
41 <i>Icteria virens</i> yellow-breasted chat	ABPBX24010			G5	S3	SC
42 <i>Ivesia argyrocoma</i> silver-haired ivesia	PDROS0X020			G2	S2.2	1B.2
43 <i>Lampropeltis zonata (parvirubra)</i> California mountain kingsnake (San Bernardino population)	ARADB19062			G4G5	S2?	SC
44 <i>Lesquerella kingii</i> ssp. <i>bernardina</i> San Bernardino Mountains bladderpod	PDBRA1N0W1	Endangered		G5T1	S1.1	1B.1
45 <i>Lewisia brachycalyx</i> short-sepaled lewisia	PDPOR04010			G4G5	S3.2	2.2
46 <i>Lilium parryi</i> lemon lily	PMLIL1A0J0			G3	S2.1	1B.2

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Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
47 <i>Linanthus killipii</i> Baldwin Lake linanthus	PDPLM090N0			G2	S2.1	1B.2
48 <i>Malaxis monophyllos ssp. brachypoda</i> adder's-mouth	PMORC1R010			G4?T4	S1.1	2.1
49 <i>Mimulus exiguus</i> San Bernardino Mountains monkeyflower	PDSCR1B140			G2	S2.2	1B.2
50 <i>Mimulus purpureus</i> purple monkeyflower	PDSCR1B2B0			G2	S2.2	1B.2
51 <i>Myotis evotis</i> long-eared myotis	AMACC01070			G5	S4?	
52 <i>Myotis thysanodes</i> fringed myotis	AMACC01090			G4G5	S4	
53 <i>Myotis volans</i> long-legged myotis	AMACC01110			G5	S4?	
54 <i>Navarretia peninsularis</i> Baja navarretia	PDPLM0C0L0			G3?	S2.2	1B.2
55 <i>Neotamias speciosus speciosus</i> Lodgepole chipmunk	AMAFB02172			G4T2T3	S2S3	
56 <i>Oxytheca parishii var. cienegensis</i> Cienega Seca oxytheca	PDPGN0J042			G4?T1	S1.3	1B.3
57 <i>Oxytheca parishii var. goodmaniana</i> Cushenbury oxytheca	PDPGN0J043	Endangered		G4?T1	S1.1	1B.1
58 <i>Pebble Plains</i>	CTT47000CA			G1	S1.1	
59 <i>Perideridia parishii ssp. parishii</i> Parish's yampah	PDAPI1N0C2			G4T3T4	S2.2?	2.2
60 <i>Phlox dolichantha</i> Big Bear Valley phlox	PDPLM0D0P0			G2	S2.2	1B.2
61 <i>Phrynosoma coronatum (blainvillii)</i> Coast (San Diego) horned lizard	ARACF12021			G4G5	S3S4	SC
62 <i>Piranga rubra</i> summer tanager	ABPBX45030			G5	S2	SC
63 <i>Poa atropurpurea</i> San Bernardino blue grass	PMPOA4Z0A0	Endangered		G2	S2.2	1B.2
64 <i>Poliomintha incana</i> frosted mint	PDLAM1L020			G5	SH	1A
65 <i>Populus angustifolia</i> narrow-leaved cottonwood	PDSAL01020			G5	S2S3	2.2
66 <i>Potentilla glandulosa ssp. ewanii</i> Ewan's cinquefoil	PDROS1B0S3			G5T1	S1.3	1B.3
67 <i>Psychomastax deserticola</i> desert monkey grasshopper	IIORT15010			G1G2	S1S2	
68 <i>Pyrrocoma uniflora var. gossypina</i> Bear Valley pyrrocoma	PDASTDT0K1			G5T2	S2.2	1B.2
69 <i>Rana muscosa</i> mountain yellow-legged frog	AAABH01140	Endangered		G2	S2	SC

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Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
70 <i>Saltugilia latimeri</i> Latimer's woodland-gilia	PDPLM0H010			G2	S2.2	1B.2
71 <i>Senecio bernardinus</i> San Bernardino ragwort	PDAST8H0E0			G2	S2.2	1B.2
72 <i>Sidalcea hickmanii</i> ssp. <i>parishii</i> Parish's checkerbloom	PDMAL110A3	Candidate	Rare	G3T1	S1.2	1B.2
73 <i>Sidalcea pedata</i> bird-foot checkerbloom	PDMAL110L0	Endangered	Endangered	G1	S1.1	1B.1
74 <i>Southern California Threespine Stickleback Stream</i>	CARE2320CA			G?	S?	
75 <i>Sphenopholis obtusata</i> prairie wedge grass	PMPOA5T030			G5	S2.2	2.2
76 <i>Streptanthus campestris</i> southern jewel-flower	PDBRA2G0B0			G2	S2.3	1B.3
77 <i>Symphyotrichum defoliatum</i> San Bernardino aster	PDASTE80C0			G3	S3.2	1B.2
78 <i>Taraxacum californicum</i> California dandelion	PDAST93050	Endangered		G2	S2.1	1B.2
79 <i>Thamnophis hammondi</i> two-striped garter snake	ARADB36160			G3	S2	SC
80 <i>Thelypodium stenopetalum</i> slender-petaled thelypodium	PDBRA2N0F0	Endangered	Endangered	G1	S1.1	1B.1

**Attachment 2:  
California Natural Diversity Data Base Forms**



# California Native Species Field Survey Form

Mail to:  
 Natural Diversity Database  
 California Dept. of Fish & Game  
 1416 Ninth Street, 12<sup>th</sup> Floor  
 Sacramento, CA 95814

For office use only			
Source Code _____	Quad Code _____		
Elm Code _____	Occ # _____		
Copy to _____	Map Index # _____		

**Date of Field Work** (Month - Day - Year) April 30 2007

**Scientific Name :** Arenaria ursina  
**Common Name :** \_\_\_\_\_

<b>Species Found?</b>	Yes	No XX	If not, why? Drought? Vehicle disturbance?	Total Number of Individuals:
-----------------------	-----	----------	---	------------------------------

Is this an existing NDDB occurrence?	Yes	Occurrence #	No	Is this a Subsequent Visit? Also not seen in 2002, also a drought year	Yes	No	#s of individuals since last visit		
							More ?	Fewer ?	Same ?
	XX	23			XX				XX

<b>Collected?</b>	no XX	Coll. #, Museum/Herbarium:
-------------------	----------	----------------------------

<b>Reporter:</b> Scott D. White
<b>Address:</b> Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
<b>Phone:</b>
<b>E-mail:</b> (909) 949-2686 / scottbioservices@earthlink.net

**Plant Phenology Information**

dormant %	sterile %	senescent %
budding %	flowering %	fruiting %

**Animal Information**

<b>Age Structure:</b>	# of adults	# of juveniles	# of unknown
Wintering	Foraging	Breeding	Roosting
		Burrow site	Other

**Location:** (please attach map)  
 San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site.

<b>County:</b> San Bernardino Co.	<b>Quad Name:</b> Fawnskin	<b>Landowner:</b> private
<b>Elevation:</b> 6800-6900 ft	<b>Township:</b> 2N	<b>Range:</b> 1W
	<b>Section (s):</b> 13 (N half)	<b>Latitude:</b> Ca. 34°16' N
		<b>Longitude:</b> Ca. 116°56' W
<b>UTM Data</b>	<b>Zone</b>	<b>Datum</b>
	<b>Source</b>	<b>Accuracy</b>
		<b>X coordinate ( E )</b>
		<b>Y coordinate ( N )</b>

**Habitat Description:** ( plant communities, dominants, associates, substrates/soils, aspects/slope )  
 Pebble plain surrounded by arid Jeffrey pine forest.  
 Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

### Site Information

**Current/surrounding land use:** Vacant, short distance S of residential development, short distance N of well-used highway  
**Visible Disturbances; possible threats:** Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	Excellent	Good	Fair	Poor
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**Comments:**

Determination method:	Photographs:	Slides	Prints	Digital
<input type="checkbox"/> Keyed in a site reference:	Organism			
<input type="checkbox"/> Compared with other specimen	Habitat			
<input type="checkbox"/> Compared with photo/sketch	Diagnostic Features			
<input type="checkbox"/> By knowledgeable individual	Other			
<input type="checkbox"/> Other method:	Permission to duplicate	yes [ ]	no [ ]	

# California Native Species Field Survey Form

Mail to:  
 Natural Diversity Database  
 California Dept. of Fish & Game  
 1416 Ninth Street, 12<sup>th</sup> Floor  
 Sacramento, CA 95814

For office use only			
Source Code _____	Quad Code _____		
Elm Code _____	Occ # _____		
Copy to _____	Map Index # _____		

**Date of Field Work** (Month - Day - Year) April 30 2007

**Scientific Name :** Arabis parishii  
**Common Name :** \_\_\_\_\_

<b>Species Found?</b>	Yes xx	No	If not, why?	Total Number of Individuals: Uncommon on pebble plains
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<b>Is this an existing NDDB occurrence?</b>	Yes xx	Occurrence # 32	No	<b>Is this a Subsequent Visit?</b> Not seen in 2002	Yes	No	#s of individuals since last visit		
								More ? xx	Fewer ?

<b>Collected?</b>	Yes xx	Coll. #, Museum/Herbarium: 11665 / RSA
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<b>Reporter:</b>	Scott D. White
<b>Address:</b>	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
<b>Phone:</b>	
<b>E-mail:</b>	(909) 949-2686 / scottbioservices@earthlink.net

### Plant Phenology Information

dormant %	sterile %	senescent %
budding %	flowering xx %	fruiting %

### Animal Information

<b>Age Structure:</b>		# of adults	# of juveniles	# of unknown
Wintering	Foraging	Breeding	Roosting	Burrow site
				Other

**Location:** (please attach map)  
 San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

<b>County:</b> San Bernardino Co.		<b>Quad Name:</b> Fawnskin		<b>Landowner:</b> private	
<b>Elevation:</b> 6800-6900 ft		<b>Township</b> 2N	<b>Range</b> 1W	<b>Section (s)</b> 13 (N half)	<b>Latitude:</b> Ca. 34°16' N
					<b>Longitude:</b> Ca. 116°56' W
<b>UTM Data</b>	<b>Zone</b>	<b>Datum</b>	<b>Source</b>	<b>Accuracy</b>	<b>X coordinate ( E )</b>
					<b>Y coordinate ( N )</b>

**Habitat Description:** ( plant communities, dominants, associates, substrates/soils, aspects/slope )  
 Pebble plain surrounded by arid Jeffrey pine forest.  
 Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

### Site Information

<b>Current/surrounding land use:</b> Vacant, short distance S of residential development, short distance N of well-used highway				
<b>Visible Disturbances; possible threats:</b> Significant vehicle damage to habitat; site proposed for development				
Overall site quality: ??	Excellent	Good	Fair	Poor
<b>Comments:</b>				
<b>Determination method:</b>		<b>Photographs:</b>		
[x] Keyed in a site reference:		Slides	Prints	Digital
[x] Compared with other specimen		Organism		
[ ] Compared with photo/sketch		Habitat		
[x] By knowledgeable individual		Diagnostic Features		
[ ] Other method:		Other		
		Permission to duplicate	yes [ ]	no [ ]

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 Sacramento, CA 95814

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Elm Code _____	Occ # _____		
Copy to _____	Map Index # _____		

**Date of Field Work** (Month - Day - Year) April 30 2007

**Scientific Name :** Ivesia argyrocoma  
**Common Name :** \_\_\_\_\_

<b>Species Found?</b>	Yes xx	No	If not, why?	<b>Total Number of Individuals:</b> Common on pebble plains
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<b>Is this an existing NDDB occurrence?</b>	Yes xx	Occurrence # 24	No	<b>Is this a Subsequent Visit?</b> Also noted in 02	Yes xx	No	<b>#s of individuals since last visit</b>		
							More ?	Fewer ?	Same ? xx

<b>Collected?</b>	Yes xx	Coll. #, Museum/Herbarium: 11658 / RSA
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<b>Reporter:</b>	Scott D. White
<b>Address:</b>	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
<b>Phone:</b>	
<b>E-mail:</b>	(909) 949-2686 / scottbioservices@earthlink.net

**Plant Phenology Information**

dormant %	sterile %	senescent %
budding %	flowering %	fruiting %

**Animal Information**

<b>Age Structure:</b>		# of adults	# of juveniles	# of unknown
Wintering	Foraging	Breeding	Roosting	Burrow site
				Other

**Location:** (please attach map)  
 San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

<b>County:</b> San Bernardino Co.		<b>Quad Name:</b> Fawnskin			<b>Landowner:</b> private	
<b>Elevation:</b> 6800-6900 ft		<b>Township</b> 2N	<b>Range</b> 1W	<b>Section (s)</b> 13 (N half)	<b>Latitude:</b> Ca. 34°16' N	<b>Longitude:</b> Ca. 116°56' W
<b>UTM Data</b>	<b>Zone</b>	<b>Datum</b>	<b>Source</b>	<b>Accuracy</b>	<b>X coordinate ( E )</b>	<b>Y coordinate ( N )</b>

**Habitat Description:** ( plant communities, dominants, associates, substrates/soils, aspects/slope )  
 Pebble plain surrounded by arid Jeffrey pine forest.  
 Other rare species? - *Arabis parishii*, *Astragalus leucolobus*, *Ivesia argyrocoma*, *Castilleja cinerea*, "C. montigena,"

**Site Information**

<b>Current/surrounding land use:</b> Vacant, short distance S of residential development, short distance N of well-used highway					
<b>Visible Disturbances; possible threats:</b> Significant vehicle damage to habitat; site proposed for development					
<b>Overall site quality: ??</b>		Excellent	Good	Fair	Poor
<b>Comments:</b>					
<b>Determination method:</b>		<b>Photographs:</b>			
<input checked="" type="checkbox"/> Keyed in a site reference:		Slides			
<input type="checkbox"/> Compared with other specimen		Prints			
<input type="checkbox"/> Compared with photo/sketch		Digital			
<input checked="" type="checkbox"/> By knowledgeable individual		Organism			
<input type="checkbox"/> Other method:		Habitat			
		Diagnostic Features			
		Other			
		Permission to duplicate			
		yes <input type="checkbox"/> no <input type="checkbox"/>			

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 California Dept. of Fish & Game  
 1416 Ninth Street, 12<sup>th</sup> Floor  
 Sacramento, CA 95814

For office use only			
Source Code	_____	Quad Code	_____
Elm Code	_____	Occ #	_____
Copy to	_____	Map Index #	_____

**Date of Field Work** (Month - Day - Year) April 30 2007

**Scientific Name :** Astragalus leucolobus  
**Common Name :** \_\_\_\_\_

<b>Species Found?</b>	Yes xx	No	If not, why?	Total Number of Individuals: Occasional to common on pebble plains
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<b>Is this an existing NDDB occurrence?</b>	Yes	Occurrence #	No xx	<b>Is this a Subsequent Visit?</b> Also noted in 02	Yes xx	No	#s of individuals since last visit		
							More ?	Fewer ?	Same ? xx

<b>Collected?</b>	Yes xx	Coll. #, Museum/Herbarium: 11705	<b>Reporter:</b> Scott D. White Scott White Biological Consulting <b>Address:</b> 201 North First Ave., No. 102 Upland, Calif. 91786 <b>Phone:</b> <b>E-mail:</b> (909) 949-2686 / scottbioservices@earthlink.net
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**Plant Phenology Information**

dormant %	sterile %	senescent %
budding %	flowering %	fruiting %

**Animal Information**

<b>Age Structure:</b>	# of adults	# of juveniles	# of unknown
Wintering	Foraging	Breeding	Roosting Burrow site Other

**Location:** (please attach map)  
 San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

<b>County:</b> San Bernardino Co.		<b>Quad Name:</b> Fawnskin		<b>Landowner:</b> private	
<b>Elevation:</b> 6800-6900 ft		<b>Township</b> 2N	<b>Range</b> 1W	<b>Section (s)</b> 13 (N half)	<b>Latitude:</b> Ca. 34°16' N
<b>UTM Data</b>		<b>Datum</b>	<b>Source</b>	<b>Accuracy</b>	<b>Longitude:</b> Ca. 116°56' W
<b>Zone</b>	<b>UTM Data</b>	<b>Datum</b>	<b>Source</b>	<b>Accuracy</b>	<b>X coordinate ( E )</b> <b>Y coordinate ( N )</b>

**Habitat Description:** ( plant communities, dominants, associates, substrates/soils, aspects/slope )  
 Pebble plain surrounded by arid Jeffrey pine forest.  
 Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

**Site Information**

**Current/surrounding land use:** Vacant, short distance S of residential development, short distance N of well-used highway  
**Visible Disturbances; possible threats:** Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	Excellent	Good	Fair	Poor
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**Comments:** \_\_\_\_\_

<b>Determination method:</b>	<b>Photographs:</b>	Slides	Prints	Digital
<input checked="" type="checkbox"/> Keyed in a site reference:	Organism			
<input checked="" type="checkbox"/> Compared with other specimen	Habitat			
<input type="checkbox"/> Compared with photo/sketch	Diagnostic Features			
<input checked="" type="checkbox"/> By knowledgeable individual	Other			
<input type="checkbox"/> Other method:	Permission to duplicate	yes <input type="checkbox"/>	no <input type="checkbox"/>	