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 accidently 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 conduced 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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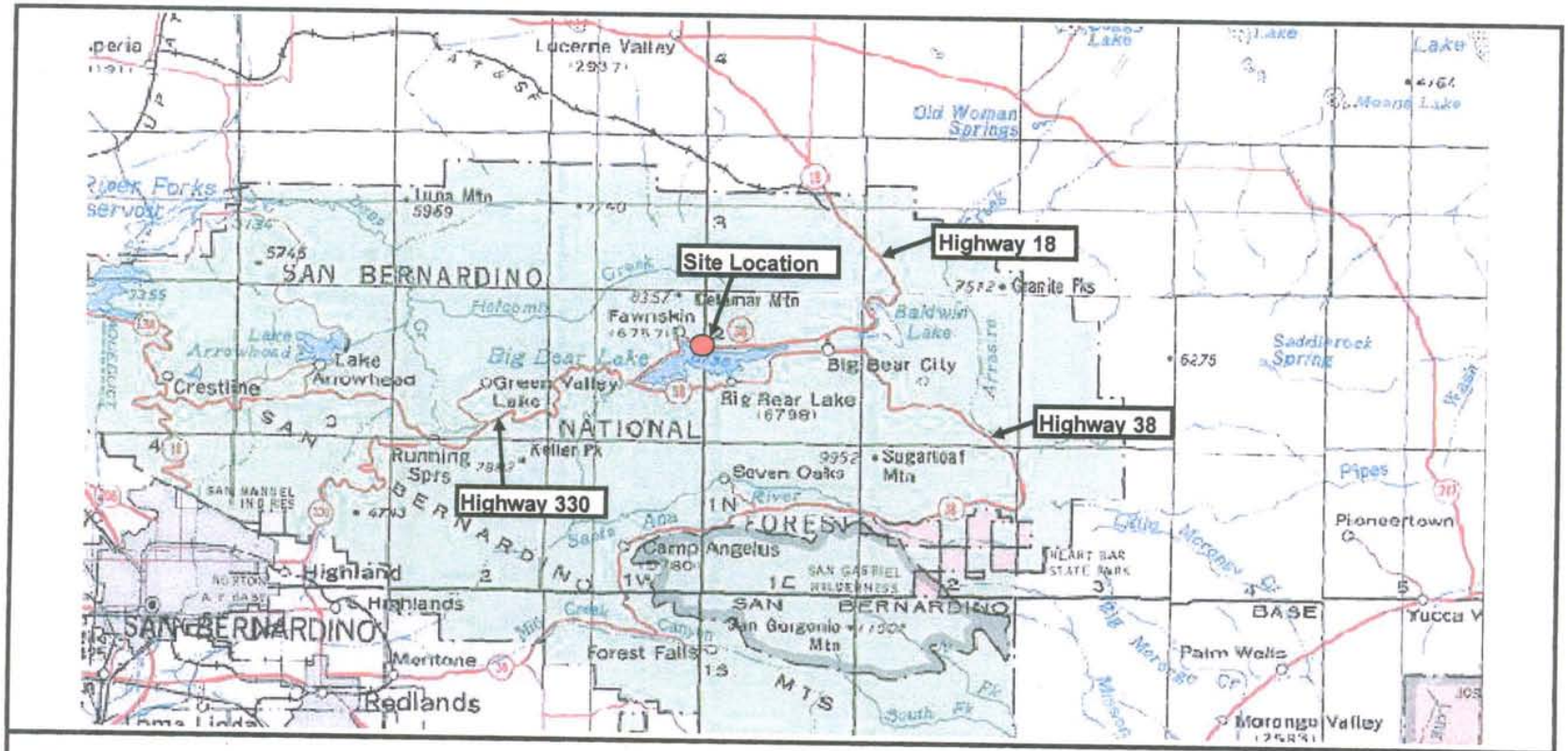
Figure 1:
Vicinity Map



Proposed Moon Camp Tenative Tract

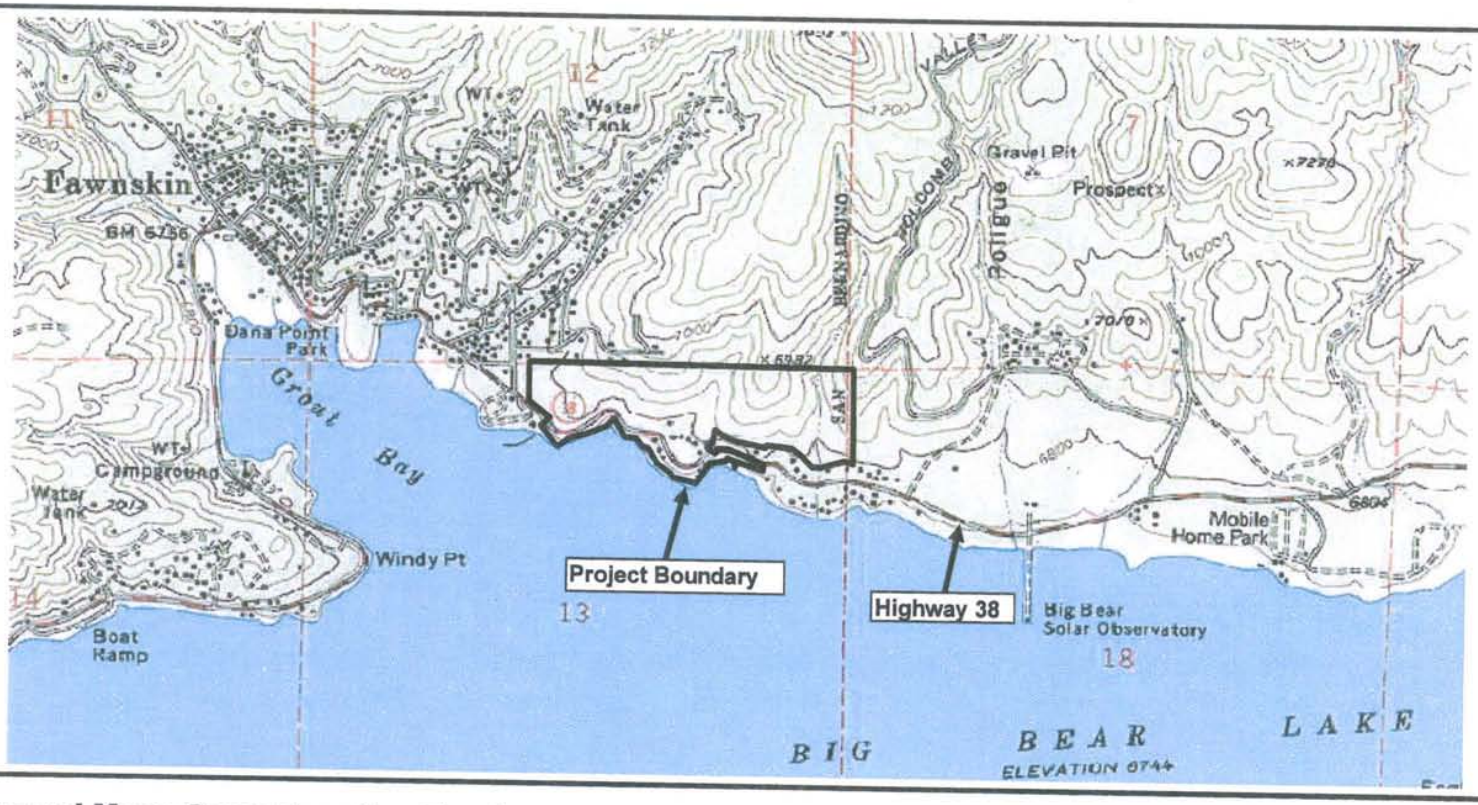
Figure 1: Vicinity Map

Scott White Biological Consulting

Map source: TOPO! 7½ minute topographic
JW: 15 Aug 2007

NORTH

Figure 2:
Project Site Map



Proposed Moon Camp Tenative Tract

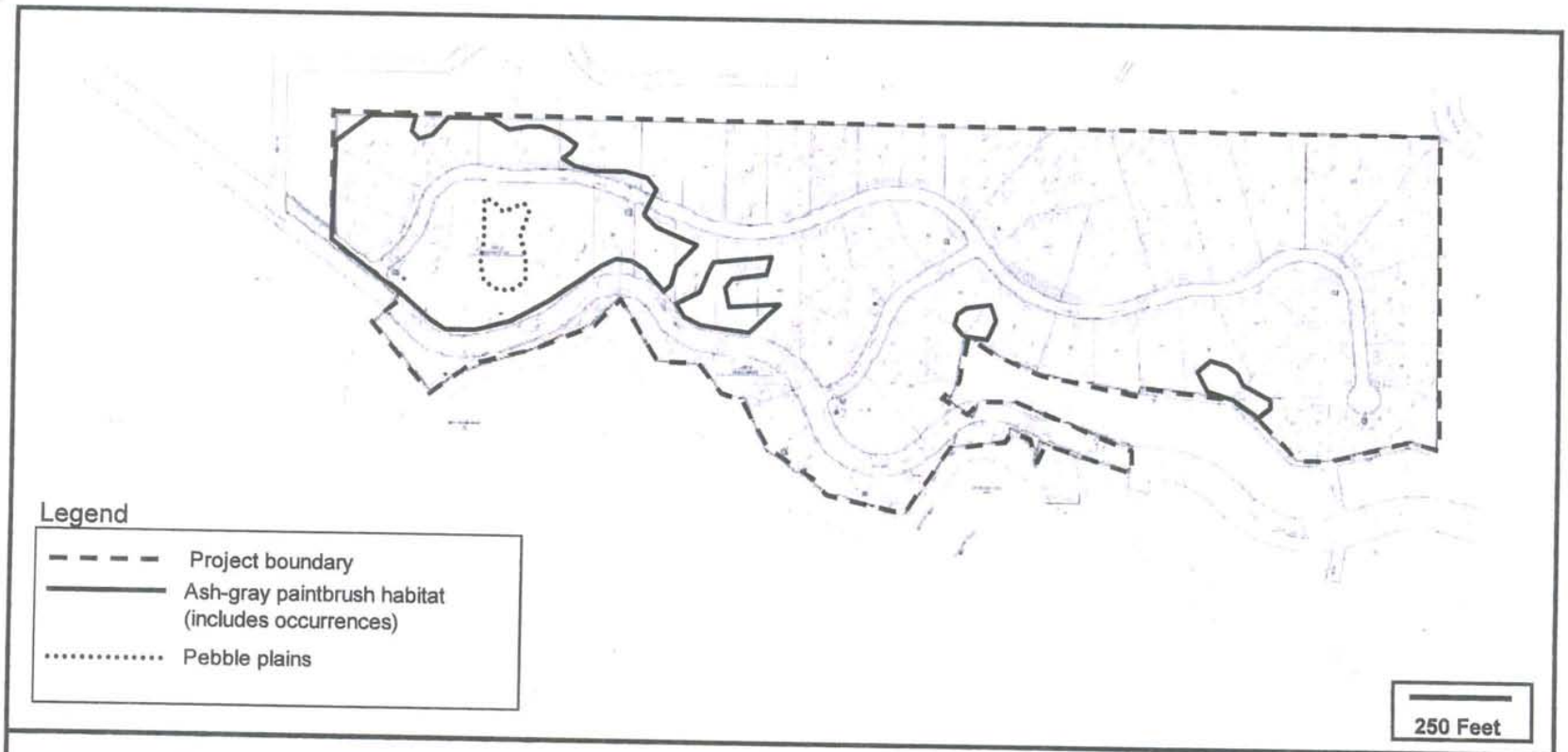
Figure 2: Site Map

Scott White Biological Consulting

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

NORTH

Figure 3:
Rare Plant Habitat



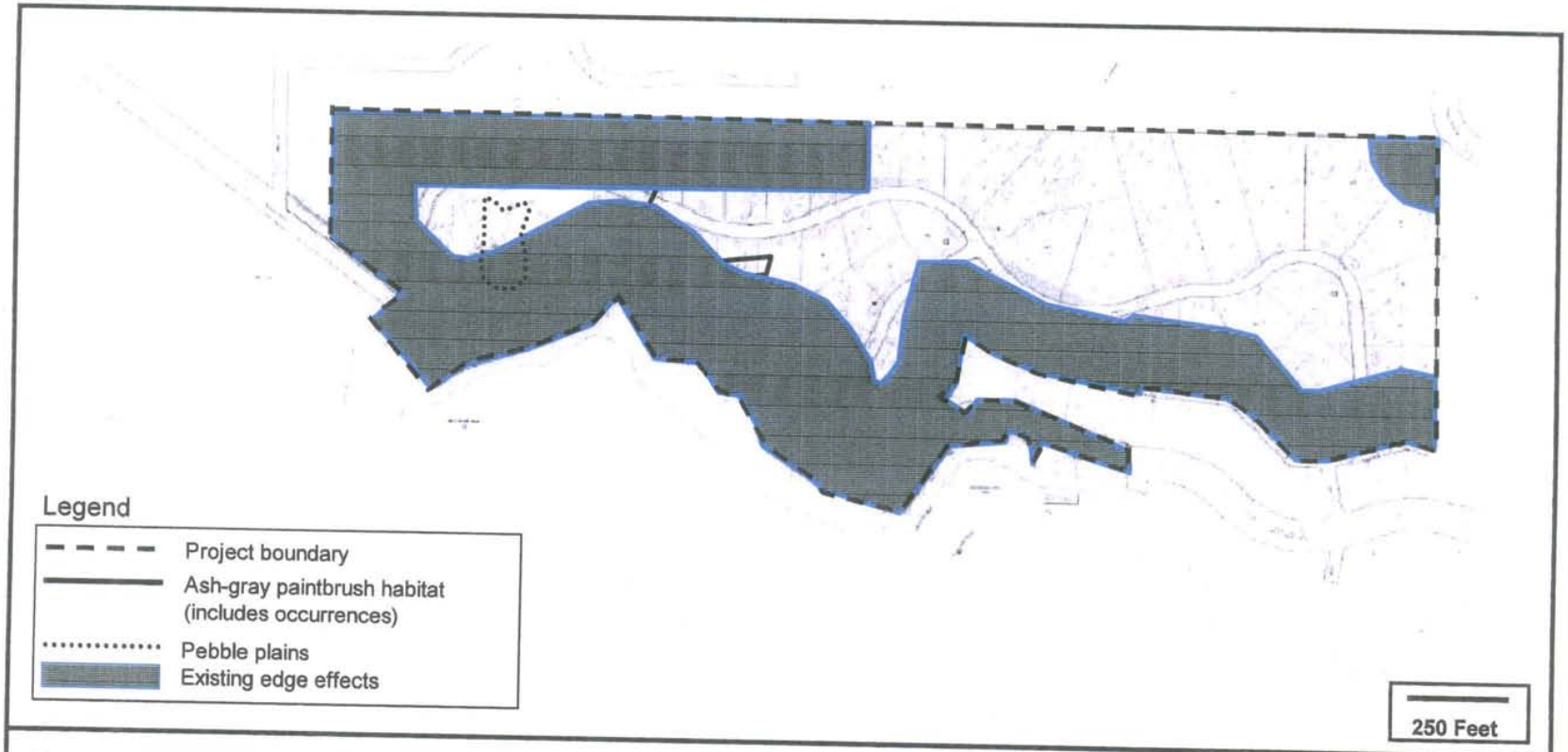
Proposed Moon Camp Tenative Tract

Figure 3: Rare Plant Habitat

Scott White Biological Consulting

Map source: Michael Brandman Associates
JW: 15 Aug 2007

Figure 4:
Edge Effect Map



Proposed Moon Camp Tenative Tract

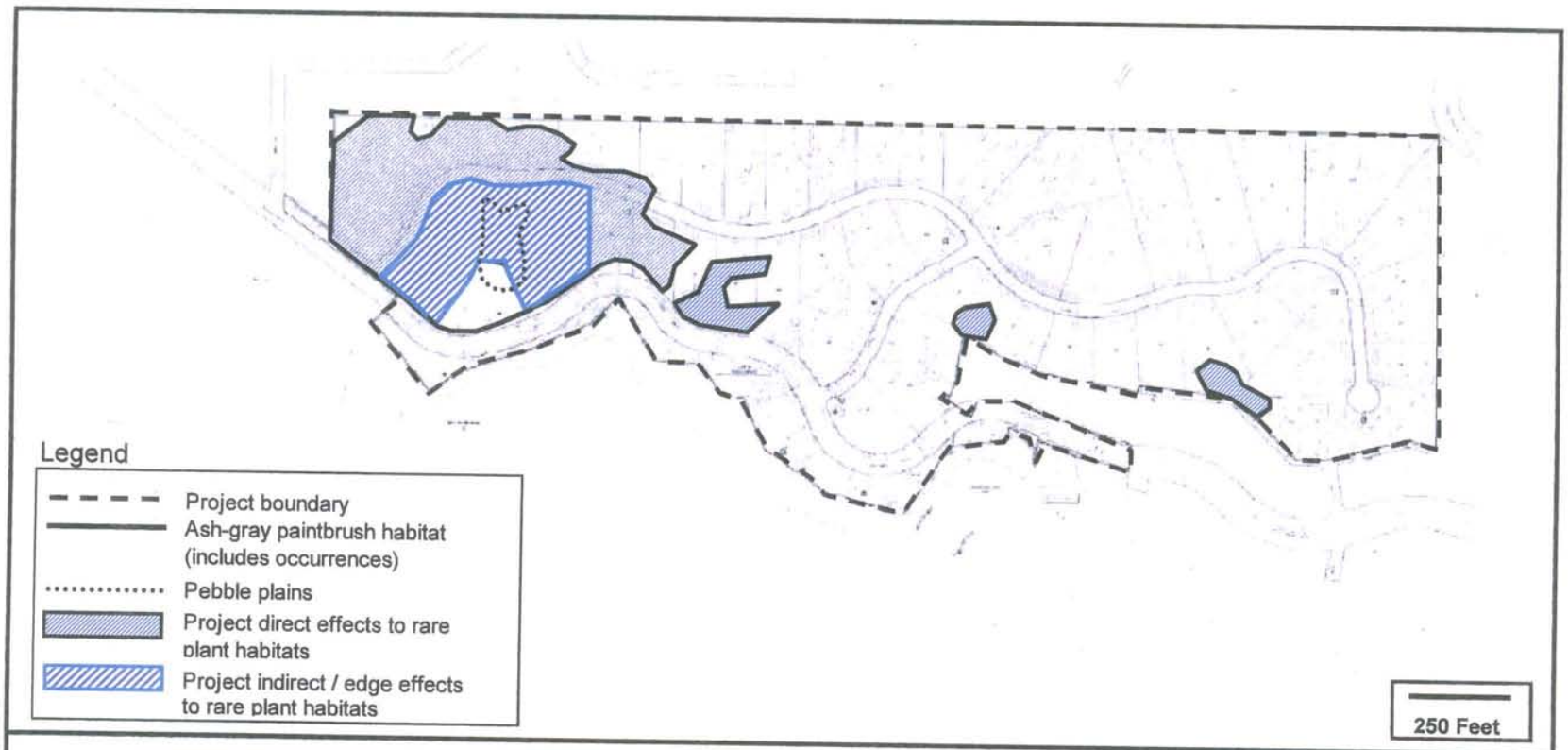
Figure 4: Existing Edge Effects

Scott White Biological Consulting

Map source: Michael Brandman Associates

JW: 15 Aug 2007

Figure 5:
Project Effects



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

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

Common name	Latin name	Reason for exclusion
Frosted mint	Poliomintha incana	No suitable habitat (desert dunes and sandy flats)
Narrow-leaved cottonwood	Populus angustifolia	No San Bernardino Mountain occurrences (local reports unverified)
Latimer's woodland gilia	Saltugilia latimeri	No habitat (desert shrubland,pinyon woodland); above elev. range (below about 6200 ft.)
Slender-petaled thelypodium	Thelypodium stenopetalum	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
Abronia nana ssp. *covillei* 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)
Allium parishii 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)
Arabis parishii 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; NDDB report)
Arenaria lanuginosa ssp. *saxosa* (*A. confusa*) 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)
Arenaria ursina Bear Valley sandwort	Perennial herb, pebble plains, occas. on carbonate soils, about 5900 - 9500 ft. elev.; San Bernardino Mtns. endemic	June - July	Fed: **THR** Calif: S 2.1 CNPS: List 1B.2	Occurs? (NDDB record #23)
Aster bernardinus (*Symphyotrichum defoliatum*) 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)
Astragalus bicristatus 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)
Astragalus lentiginosus var. *sierrae* 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)
Astragalus leucolobus 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
Calochortus palmeri vars. *palmeri* and *munzii* Palmer's & Munz's mariposa lilies	Bulb; meadows or seasonally moist sites; about 3300 - 7200 ft. elev.; var. *palmeri* occurs S Coast & Transverse Ranges, reported but not verified San Jacinto Mtns; var. *munzii* endemic to San Jacintos, reported but not verified in San Bernardinos	May - July	Fed: none CNPS List 1B.2 var *palmeri*: Calif: S 2.1 var. *munzii*: 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
Carex occidentalis 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)
Castilleja cinerea 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 CNDDB report)
Castilleja lasiorhyncha (*Orthocarpus lasiorhynchus*) 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)
Castilleja applegateii ssp. *martinii* × *C. angustifolia* (=*C. montigena, C. martinii* var. *ewanii*) 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)
Dryopteris filix-mas 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)
Dudleya abramsii ssp. *affinis* 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)
Eriogonum foliosum (*E. evanidum*) 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)
Eriogonum kennedyi var. *austromontanum* 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: **THR** Calif: S2.2 CNPS: List 1B.2	Apparent introgression w/ Wright's buckwheat (see text)
Eriogonum microthecum var. *lacus-ursi* 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)
Eriophyllum lanatum var. *obovatum* 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
Galium jepsonii (*G. angustifolium* var. *subglabrum*) 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)
Galium johnstonii (*G. angustifolium* var. *pinetorum*) 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)
Gilia leptantha ssp. *leptantha* San Bernardino Mtn. gilia	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)
Heuchera hirsutissima Shaggy-haired alum root *Heuchera parishii* Parish's alumroot	Perennial herbs; rocky outcrops, cliffs, slopes; montane forest or alpine boulderfields; above about 4800 ft. elev.; *H. hirsutissima* is endemic to San Jacinto and Santa Rosa Mtns (unconfirmed from San Bernardino Mtns); *H. parishii* endemic to San Bernardino Mtns	May - July	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (poorly suitable habitat)
Hulsea vestita ssp. *parryi* 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)
Ivesia argyrocoma 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)
Juncus duranii 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)
Lewisia brachycalyx Short-sepaled 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)
Lilium parryi 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)
Linanthus killipii 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
Mimulus exiguus 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)
Mimulus purpureus 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)
Navarretia peninsularis 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)
Oxytheca caryophylloides 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)
Perideridia parishii ssp. *parishii* 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)
Phacelia exilis (*P. mohavensis* var. *exilis*) 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)
Phacelia mohavensis 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)
Phlox dolichantha 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)
Poa atropurpurea 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: **END** Calif: S2.2 CNPS: List 1B.2	Low (habitat marginal at best)
Potentilla glandulosa ssp. *ewanii* 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)
Pyrrocoma uniflora ssp. *gossypina* (*Haplopappus uniflorus* ssp. *gossypinus*) 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
Rupertia rigida (*Psoralea rigida*) 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)
Selaginella asprella 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)
Senecio bernardinus (*Packera bernardinoa*) 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)
Senecio ionophyllus 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)
Sidalcea hickmanii ssp. *parishii* 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: **Rare** S 1.2 CNPS: List 1B.2	Minimal (marginal habitat, above elev. range)
Sidalcea pedata 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: **END** Calif: **END**, 1.1 CNPS: List 1B.1	Low (habitat marginal at best)
Sphenopholis obtusata 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)
Streptanthus bernardinus 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)
Streptanthus campestris 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)
Swertia neglecta (*Frasera neglecta*) 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)
Taraxacum californicum California dandelion	Perennial herb; wet meadows, about 5300 - 9200 ft. elev.; San Bernardino Mtns endemic	May - Aug	Fed: **END** 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
Thelypodium stenopetalum 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: **END** Calif: **END**, 1.1 CNPS: List 1B.1	Minimal (no alkaline meadow habitat)
Trichostema micranthum 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)
Viola pinetorum ssp. *grisea* 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 lB: 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

Latin Name	**Common Name**		
CUPRESSACEAE	CYPRESS FAMILY		
Calocedrus decurrens	Incense cedar	Occas. / forest	
Juniperus occidentalis	Western juniper	Comm. / forest	
PINACEAE	PINE FAMILY		
Abies concolor	White fir	Occas. / forest	
Pinus jeffreyi	Jeffrey pine	Comm. / forest	
Pinus monophylla	Pinyon pine	Occas. /forest	
APIACEAE	CELERY FAMILY		
Lomatium nevadense	Nevada lomatium	Uncomm. / forest	11669
Tauschia parishii	Parish tauschia	Scarce / open places	11668
ASTERACEAE	ASTER FAMILY		
Achillia millefolium	California yarrow	Comm. / esp. mesic sites	
Agoseris retrorsa	Spear-leaved agoseris	Occas. / throughout	
Antennaria dimorpha	Low everlasting	Comm. / pebble plains	
Artemisia dracunculus	Tarragon	Occas. / esp. near road, lakeshore	
Artemisia ludoviciana	Western mugwort	Occas. / open places, washes	
Artemisia tridentata	Great Basin sagebrush	Comm. / open forest	
Aster frondosus	Short-rayed alkali aster	Occas.-comm. / near shore	
Chrysothamnus nauseosus	Common rabbitbrush	Occas. / throughout	
Chrysothamnus viscidiflorus	Curlleaf rabbitbrush	Occas.-comm. / throughout	
Cirsium occidentale var. californicum	California thistle	Uncomm. / open sites	
* *Cirsium vulgare*	Bull thistle	Occas. / near shore	
Erigeron breweri	Brewer's daisy	Occas. / forest	
Erigeron divergens	Diffuse daisy	Comm. / gen. open places	11667
Eriophyllum confertiflorum	Golden yarrow	Comm. / ± throughout	
Gnaphalium canescens	Perennial cudweed	Uncomm. / gen. open places	
* *Gnaphalium luteo-album*	Pearly everlasting	Occas. / roadside, shoreline	
Hymenopappus filifolius	Columbia cutleaf	Uncomm. / open forest	
* *Lactuca serriola*	Prickly lettuce	Occas. / mostly roadside	
Lessingia filaginifolia (Corethrogyne filaginifolia)	Chaparral aster	Occas. / open forest	
Madia elegans	Elegant tarplant	Occas. / forest	
* *Senecio vulgaris*	Common groundsel	Uncomm. / gen. roadside	
Solidago californica	Calif. goldenrod	Occas. / mesic sites	
* *Sonchus oleraceus*	Common sow thistle	Occas. / near shore	
* *Taraxacum officinale*	Common dandelion	Occas. / roadside, shoreline	
Tetradymia comosa	Hairy horsebrush	Occas. / open forest	
* *Tragopogon dubius*	Oyster plant, salsify	Occas. / roadside, forest	
BORAGINACEAE	BORAGE FAMILY		
Cryptantha micrantha	Purple root cryptantha	Occas. / open places	
Cryptantha simulans	Popcorn flower	Scarce / open places	11670
BRASSICACEAE	MUSTARD FAMILY		
Arabis holboellii (?)	Holboell's rock-cress	Occas. / open forest	
** *Arabis parishii*	Parish's rock-cress	Occas. / pebble plains	11665
Caulanthus major	Slender wild-cabbage	Occas. / forest	
Descurainia incisa (D. richardsonii)	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.			
Descurainia pinnata	Tansy mustard	Occas. / mostly open forest	
Erysiumum capitatum	Douglas wallflower	Occas. / ±throughout	
* *Lepidium virginicum v. pubescens*	Wild peppergrass	Occas. / mostly roadside, shoreline	
* *Sisymbrium altissimum*	Tumble mustard	Occas. / roadside	
CACTACEAE	CACTUS FAMILY		
Opuntia basilaris var. basilaris	Common beavertail cactus	Uncomm. / open forest	
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY		
Symphoricarpos rotundifolius var. parishii	Parish snowberry	Occas. / shaded forest	
CARYOPHYLLACEAE	CARNATION FAMILY		
Silene verecunda ssp. platyota	Cuyamaca campion	Occas. / forest	
CHENOPODIACEAE	GOOSEFOOT FAMILY		
* *Chenopodium album (?)*	Common goosefoot	Occas. / throughout	
* *Salsola tragus*	Russian thistle, tumbleweed	Occas. / mostly roadside	
CONVOLVULACEAE	MORNING GLORY FAMILY		
Calystegia malacophylla ssp. fulcrata (C. fulcrata)	Morning glory	Occas. / throughout	
ERICACEAE	MANZANITA FAMILY		
Arctostaphylos patula	Greenleaf manzanita	Occas.-comm. / forest	
EUPHORBIACEAE	SPURGE FAMILY		
Chamaesyce albomarginata	Rattlesnake spurge	Occas. / open forest	
Euphorbia palmeri	Wood spurge	Occas. / uplands	
FABACEAE	PEA FAMILY		
Amorpha californica	Calif. false indigo	Occas. / mesic forest	
** *Astragalus leucolobus*	Bear Valley woollypod	Comm. / pebble plains	11705
Astragalus douglasii	Douglas rattleweed	Uncomm. / open places	
Lotus argyraeus	Silver lotus	Occas. / open forest	
Lotus nevadensis	Nevada lotus	Comm. / open places	
Lupinus cf. breweri	Silver mat lupine	Comm. / pebble plains, etc.	
Lupinus excubitus var. austromontanus	Southern mountain lupine	Occas. / ±throughout	11666
Lupinus lepidus v. confertus	Prairie lupine	Occas. / lakeshore	
* *Medicago lupulina*	Black medick	Uncomm. / near lakeshore	
* *Melilotus alba*	White sweet-clover	Occas.-comm. / roadsides, shore	
FAGACEAE	OAK FAMILY		
Quercus kelloggii	California black oak	Comm. / forest	
GERANIACEAE	GERANIUM FAMILY		
* *Erodium cicutarium*	Red-stemmed filaree	Occas.-comm. / roadsides, etc.	
HYDROPHYLLACEAE	WATERLEAF FAMILY		
Eridictyon trichocalyx	Yerba santa	Occas. / open forest	
Phacelia distans (?)	Common phacelia	Uncomm. / open forest	
Phacelia imbricata	Broad-sepaled phacelia	Uncomm. / open forest	
LAMIACEAE	MINT FAMILY		
Monardella linoides (?) (or M. odoratissima)	Flax-leaved monardella	Occas. / forest	
Scutellaria siphocampyloides (S. austinae)	Austin's skullcap	Uncomm. / mesic forest	
LOASACEAE	STICK-LEAF FAMILY		
Mentzelia sp.	Unid. stick-leaf	Uncomm. / uplands	11674
MALVACEAE	MALLOW FAMILY		
* *Malva parviflora*	Cheeseweed	Occas. / mostly lakeshore	
ONAGRACEAE	EVENING PRIMROSE FAMILY		
Clarkia sp.	Unid. annual clarkia	Uncomm. / shaded forest	

Appendix 3: Species list

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

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

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	***Accipiter cooperii*** Cooper's hawk	ABNKC12040			G5	S3	SC
2	***Antennaria marginata*** white-margined everlasting	PDAST0H1G0			G4G5	S1.3	2.3
3	***Arabis dispar*** pinyon rock cress	PDBRA060F0			G3	S2.3	2.3
4	***Arabis parishii*** Parish's rock cress	PDBRA061C0			G2	S2.1	1B.2
5	***Arabis shockleyi*** Shockley's rock cress	PDBRA061V0			G3	S2.2	2.2
6	***Arenaria lanuginosa ssp. saxosa*** rock sandwort	PDCAR040E4			G5T5	S1.3	2.3
7	***Arenaria ursina*** Big Bear Valley sandwort	PDCAR040R0	Threatened		G2	S2.1	1B.2
8	***Astragalus albens*** Cushenbury milk-vetch	PDFAB0F0A0	Endangered		G1	S1.1	1B.1
9	***Astragalus lentiginosus var. sierrae*** Big Bear Valley milk-vetch	PDFAB0FB9L			G5T1	S1?	1B.2
10	***Astragalus leucolobus*** Big Bear Valley woollypod	PDFAB0F4T0			G2	S2.2	1B.2
11	***Astragalus tricarinatus*** triple-ribbed milk-vetch	PDFAB0F920	Endangered		G1	S1.2	1B.2
12	***Atriplex parishii*** Parish's brittlescale	PDCHE041D0			G1G2	S1.1	1B.1
13	***Botrychium crenulatum*** scalloped moonwort	PPOPH010L0			G3	S2.2	2.2
14	***Calochortus palmeri var. palmeri*** Palmer's mariposa lily	PMLIL0D122			G2T2	S2.1	1B.2
15	***Calochortus plummerae*** Plummer's mariposa lily	PMLIL0D150			G3	S3.2	1B.2
16	***Calochortus striatus*** alkali mariposa lily	PMLIL0D190			G2	S2.2	1B.2
17	***Castilleja cinerea*** ash-gray Indian paintbrush	PDSCR0D0H0	Threatened		G2	S2.2	1B.2
18	***Castilleja lasiorhyncha*** San Bernardino Mountains owl's-clover	PDSCR0D410			G2	S2.2	1B.2
19	***Chaetodipus fallax pallidus*** pallid San Diego pocket mouse	AMAFD05032			G5T3	S3	SC
20	***Charina trivirgata*** rosy boa	ARADA02010			G4G5	S3S4	
21	***Charina umbratica*** southern rubber boa	ARADA01011		Threatened	G5T2T3	S2S3	
22	***Corynorhinus townsendii*** Townsend's big-eared bat	AMACC08010			G4T3T4	S2S3	SC
23	***Dryopteris filix-mas*** male fern	PPDRY0A0B0			G5	S1.3	2.3

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

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

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
70	***Saltugilia latimeri*** Latimer's woodland-gilia	PDPLM0H010			G2	S2.2	1B.2
71	***Senecio bernardinus*** San Bernardino ragwort	PDAST8H0E0			G2	S2.2	1B.2
72	***Sidalcea hickmanii ssp. parishii*** Parish's checkerbloom	PDMAL110A3	Candidate	Rare	G3T1	S1.2	1B.2
73	***Sidalcea pedata*** bird-foot checkerbloom	PDMAL110L0	Endangered	Endangered	G1	S1.1	1B.1
74	***Southern California Threespine Stickleback Stream***	CARE2320CA			G?	S?	
75	***Sphenopholis obtusata*** prairie wedge grass	PMPOA5T030			G5	S2.2	2.2
76	***Streptanthus campestris*** southern jewel-flower	PDBRA2G0B0			G2	S2.3	1B.3
77	***Symphyotrichum defoliatum*** San Bernardino aster	PDASTE80C0			G3	S3.2	1B.2
78	***Taraxacum californicum*** California dandelion	PDAST93050	Endangered		G2	S2.1	1B.2
79	***Thamnophis hammondii*** two-striped garter snake	ARADB36160			G3	S2	SC
80	***Thelypodium stenopetalum*** 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, 12th 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 :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
		XX	Drought? Vehicle disturbance?	

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

Collected?	no xx	*Coll. #,Museum/Herbarium:*

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

Plant Phenology Information

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

Animal Information

Age Structure:	# 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.

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

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*
Comments:

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

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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 :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Uncommon on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	32			Not seen in 2002			*More ?*	*Fewer ?*	*Same ?*
								xx		

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11665 / RSA

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

Plant Phenology Information

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

Animal Information

Age Structure:	*# 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

County:	**Quad Name:**	**Landowner:**
San Bernardino Co.	Fawnskin	private

Elevation:	*Township*	*Range*	*Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N	1W	13 (N half)	Ca. 34°16' N	Ca. 116°56' W

UTM Data	*Zone*	*Datum*	*Source*	*Accuracy*	*X coordinate (E)*	*Y coordinate (N)*

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*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

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

Scientific Name : *Ivesia argyrocoma*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Common on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		***Is this a Subsequent Visit?***	Yes	No	*#s of individuals since last visit*		
	xx	24			Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?* xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11658 / RSA

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

Plant Phenology Information

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

Animal Information

Age Structure:		*# 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

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

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*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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1416 Ninth Street, 12th 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 :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional to common on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		***Is this a Subsequent Visit?***	Yes	No	*#s of individuals since last visit*		
			xx		Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?* xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11705

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

Plant Phenology Information

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

Animal Information

Age Structure:	*# 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

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

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*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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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 : *Castilleja cinerea*
Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional on pebble plain and open forest, with Eriogonum wrightii subscaposum

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	24			Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?* xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11657 / RSA

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

Plant Phenology Information

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

Animal Information

Age Structure:	*# 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

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township*	*Range*	*Section (s)*
6800-6900 ft	2N	1W	13 (N half)
Latitude:	*Longitude:*		
Ca. 34°16' N	Ca. 116°56' W		

UTM Data	*Zone*	*Datum*	*Source*	*Accuracy*	*X coordinate (E)*	*Y coordinate (N)*

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*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *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, 12th 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 : *Castilleja "montigena"*
Common Name :

Species Found?	Yes	No	If not, why?	Total Number of Individuals:
	xx			Occasional in forest

Is this an existing NDDB occurrence?	Yes	Occurrence #	No		Is this a Subsequent Visit?	Yes	No	#s of individuals since last visit: More ?	Fewer ?	Same ?
			xx		Also seen in 02	xx				xx

Collected?	Yes / No	Coll. #,Museum/Herbarium:

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

Plant Phenology Information

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

Animal Information

Age Structure:	# 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

County:	Quad Name:	Landowner:
San Bernardino Co.	Fawnskin	private

Elevation:	Township	Range	Section (s)	Latitude:	Longitude:
6800-6900 ft	2N	1W	13 (N half)	Ca. 34°16' N	Ca. 116°56' W

UTM Data	Zone	Datum	Source	Accuracy	X coordinate (E)	Y coordinate (N)

Habitat Description: (plant communities, dominants, associates, substrates/soils, aspects/slope)
Arid Jeffrey pine forest; generally in relatively shaded places
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
Comments:				

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

A.9 - Supplemental Focused Rare Plant Survey (Tim Krantz, June 2008)

MOON CAMP TENTATIVE TRACT 16136

SUPPLEMENTAL FOCUSED RARE PLANT SURVEY

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Dr. Timothy P. Krantz
Timothy Krantz Environmental Consulting
(a division of Pangaea Nova LLC)
P.O. Box 33
Angelus Oaks, CA 92305

June 29, 2008

Project site location:	USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
Assessors Parcel Nos.:	0304-082-04 and 0304-091-12, 13 and 21
Owner /Applicant:	Tim Wood, P.O. Box 6820, Big Bear Lake, CA 92315
Principal Investigator:	Dr. Timothy P. Krantz, (909)748-8590

MOON CAMP TENTATIVE TRACT
SUPPLEMENTAL FOCUSED RARE PLANT SURVEY

TABLE OF CONTENTS

MAPS, APPENDICES, AND ATTACHMENTS

MOON CAMP TENTATIVE TRACT 16136
SUPPLEMENTAL RARE PLANT SURVEY

I. EXECUTIVE SUMMARY

A focused rare plant survey of the Moon Camp Tentative Tract 16136 was completed for the property. This survey supplements a general botanical survey of the property conducted by Scott White Biological Consulting, dated August 2007 (White 2007, henceforth, "White survey"). The White survey positively identified one federally-listed plant species—ashy-gray Indian paintbrush (*Castilleja cinerea)*—and four special-status species: Parish's rock-cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus* leucolobus), Heckard's paintbrush (*Castilleja montigena*) and silver-haired rattails (*Ivesia argyrocoma*) (Table 1).

This supplemental survey affirmed the presence of these species, and added two additional special-status species: purple monkeyflower (*Mimulus purpureus*) and Sugarloaf phlox (*Phlox dolichantha*); and disaffirmed presence of a list of other special-status and federally-listed plant species deemed to potentially occur on the property, according to White (Table 2).

The White survey had identified 13.81 acres of ashy-gray paintbrush habitat, distributed among four occurrences (Figure 1). This supplemental survey found the two easternmost occurrences to be erroneous. No ashy-gray Indian paintbrush plants occur at those two sites. In addition, the occupied habitat of the middle occurrence was found to cover less than one-third the estimated acreage reported by White, and the western occurrence exhibited a somewhat smaller occupied habitat footprint, but was deemed to generally conform to White's estimated acreage. Altogether, the occupied habitat of ashy-gray Indian paintbrush has been recalculated to approximately 7.71 acres.

II. PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for Moon Camp Tentative Tract 16136—a proposed 50-lot 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 the community of Fawnskin, in unincorporated San Bernardino County. The project site is comprised of about 62 acres, situated 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 Figures 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."

III. FOCUSED STUDY / SPECIES OF CONCERN

The White survey was conducted on three dates, April 30, June 7, and August 8, during the 2007 season. The 2007 precipitation season (measured from July 1 to June 30 annually) was a record drought year for the San Bernardino Mountains, with only 11.66 inches of precipitation recorded at Big Bear Dam, compared to an average annual precipitation of 36.00 inches. For this reason, White recommended that additional surveys be accomplished to determine presence or absence of four federally-listed endangered plant species known to occur in montane meadow habitats; and that a subsequent survey should be accomplished on site to determine presence or absence of three federally-listed species known to occur on pebble plain habitat. In addition, there are numerous other special-status plant species potentially occurring in the area , particularly annual species, that would not be identifiable during extreme drought years.

The 2008 precipitation year was average, with 35.29 inches through May this year, and flowering of both annual and perennial species exhibited good anthesis.

This report focuses on determining presence or absence of the following plant species:

Montane Meadow Species:

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

Pebble Plain Species:

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

IV. METHODOLOGY

California Department of Fish and Game field survey protocols were followed for each of the target federal-listed species considered to potentially occur on site (CDFG 2000). These protocols basically require that surveys are conducted following these guidelines: (1) conducted during flowering seasons for the special status plants known from the area, (b) were floristic in nature, (c) were consistent with conservation ethics, (d) systematically covered all habitat types on the site, and (e) are well documented by this report.

A walkover of the Moon Camp property was conducted on May 5, 12 and June 6, 2008. The May 5 and 12th surveys focused on the "meadow" habitat along the lakeshore of the Big Bear Lake reservoir; and on identification of any special-status early-blooming annual plant species. The June 6 survey focused on delineation of the ashy-gray Indian paintbrush occurrences; and on identification of late-blooming annuals and perennials.

May surveys for other projects elsewhere in Big Bear Valley (North Baldwin Lake, Pan Hot Springs, Sawmill/Sugarloaf pebble plains, Eagle Point) had indicated that all seven federal-listed species considered to potentially occur on site, according to the White survey, were observed and reliably identifiable at the time of the early May surveys; and the ashy-gray paintbrush and other potential pebble plain species were readily visible, with fully-mature inflorescences, at the time of the June survey.

Positive findings (only pebble plain-associated species, including ashy-gray paintbrush) were precisely located using a Garmin GPS; and GPS data was downloaded and displayed at the Redlands Institute GIS laboratory, and transferred to the EIR consultant, Michael Brandman Associates, to their Palm Springs office; and to the project engineer, Hicks and Hartwick Engineering, in Redlands.

The meadow habitat was carefully walked throughout its narrow distribution along the lakeshore, and any other vernal springs or areas of persistent surface soil moisture were closely examined for potential endangered meadow species; and for the presence of special-status vernal annual species, such as eye-strain monkey-flower (*Mimulus exiguus*) or yellow owl's-clover (*Castilleja lasiorhyncha*).

The White survey reported four ashy-gray paintbrush occurrences, and these were the focus of the June 6 field survey—to confirm those locations and obtain an accurate GPS delineation of the ashy-gray paintbrush distribution and pebble plain habitat on the property.

V. RARE, ENDANGERED OR SENSITIVE SPECIES AND HABITATS (RESULTS)

Endangered Meadow Species

Of the four federally-listed endangered meadow species (Section 3, above), none were identified on site; and they are not considered likely to occur on site. The lakeshore habitat is not indigenous meadow habitat, such as supports the endemic meadow flora elsewhere in Big Bear Valley (Krantz 1979, 1980, 1981a, et alus); rather, it is what this author calls "ruderal" reservoir habitat. Ruderal means, "growing where the natural vegetational cover has been disturbed by man." (Webster's 9th Collegiate Dictionary) In this case, the ruderal reservoir habitat is comprised of a mix of native and non-native, aquatic and semi-aquatic plant species, existing in the zone between the high water level of the reservoir and the draw-down area. Native meadow species sometime occur along the narrow margin just above the high water level, but in the case of the Moon Camp property, this is very limited to a strand of willows (*Salix scouleriana)* and a non-diverse assemblage of common wetland species, such as wiregrass (*Juncus balticus*), yarrow (*Achillea millefolium*) and silver-leaved cinquefoil (*Potentilla anserina*).

No endangered, threatened, or special-status meadow plant species were identified on the Moon Camp property, and the potential for any occurrence of such species is considered to be extremely low.

Pebble Plain Species

The White survey had previously mapped a known pebble plain occurrence on the western portion of the property. This pebble plain contains many of the characteristic species occurring on other pebble plains in Big Bear and Holcomb Valleys, but for the Kennedy's southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*), which is replaced by the closely-related taxon, Wright's matting buckwheat (*Eriogonum wrightii* var. *subscaposum*), and absence of Bear Valley sandwort (*Arenaria ursina*). Kennedy's southern mountain buckwheat and Bear Valley sandwort were used as indicator species of pebble plains by the author, during his original systematic surveys of this endemic plant community (Krantz 1981b, 1983). The lack of both indicator species on the Moon Camp property resulted in this area not being indicated as pebble plain habitat during those initial surveys. However, the area indicated as "pebble plain" within Open Space Lot A has many other species commonly associated with true pebble plain habitat, and has been mapped as such on Figure 3.

Ashy-gray paintbrush (*Castilleja cinerea*) had been mapped as four distinct occurrences by White, but the author, in conjunction with this survey, found that the two eastern occurrences, indicated as occurring behind (north of) Lots 22, and 29-30-31 of the adjacent existing residential tract, do not support any ashy-gray paintbrush plants. There were openings of Wright's matting buckwheat at these locations, with silver rat-tails (*Ivesia argyrocoma*), which is sometimes associated with pebble plains, and Heckard's paintbrush (*Castilleja montigena*) was found on the perimeter of the openings, but no ashy-gray paintbrush exists at those locations. To verify that the author was, indeed, at the proper locations, the areas considered to be concurrent with those areas indicated by White were delineated with GPS data points to confirm the negative findings.

Similarly, the GPS delineation of the middle ashy-gray paintbrush occurrence was found to be less than one-third the size of the occupied habitat indicated in the White survey (0.11-acre actual occupied habitat, consisting of approximately 50 plants). This occurrence corresponds to the

southernmost portions of proposed Lots 47 and 48, adjoining Highway 18. In this case, it appeared that White had mapped the Wright's matting buckwheat distribution, without regard to association with the ashy-gray paintbrush.

Another very small ashy-gray paintbrush occurrence was located at the rear of Lot 49, comprised of 0.01-acre, and consisting of 10 plants.

A single point, representing three ashy-gray paintbrush plants, was located at the vernal spring on the rear portion of Lot 50; and the easternmost portion of the primary pebble plain occurrence on Lot A extends into Lot 50 on its southwestern quarter, comprising about 0.11-acre of occupied habitat.

The primary pebble plain (the westernmost occurrence according to White) was found to be more restricted than indicated by White at the eastern portion of the occurrence on Lots 49 and 50, but generally conformed to the area indicated by White in the area of the central pebble plain (within the proposed rare plant preserve) and toward the western portion of the pebble plain and ashy-gray paintbrush area. The actual occupied habitat of ashy-gray paintbrush on Lots 1 through 5 was calculated to comprise 2.07 acres.

The most exemplary pebble plain habitat on the Moon Camp property was found to conform to the area indicated by White, and would be entirely included within the proposed 4.2 acre conservation easement area. Fencing of the highway frontage has stopped the unauthorized off highway vehicle use that was evidenced on the pebble plain habitat from years past.

To summarize the results of the survey of ashy-gray paintbrush occupied habitat, it is distributed among four occurrences: Lot 47—0.11 acre, Lot 49—0.01 acre, Lot 50—0.11 acre, and the pebble plain and more extensive western occurrence, comprising 4.91 acres within Lot A, 2.07 acres within Lots 1-5, and 0.5 acre within Road A, for a total of 7.7 acres of occupied ashy-gray paintbrush.

Other Special Status Species

Two new special status species were added to the project list: purple monkeyflower (*Mimulus purpureus*) and Sugarloaf phlox (*Phlox dolichantha*). Purple monkeyflower was found to be rather widely distributed on the pebble plain and extending down into the draw to the east, corresponding to the southern half of proposed Lot 50. This draw exhibited vernal spring habitat characteristics; that is, an association of very tiny, ephemeral annuals, such as moss juncus (*Juncus bryoides*), hispid popcorn flower (*Plagiobothrys hispidulus*) and other minute monkeyflower species, such as *Mimulus androsaceus* and *M. suksdorfii*. Most of the purple monkeyflower distribution is included within the proposed 4.2 acre conservation easement area.

Sugarloaf phlox was found to be rather widely distributed on the Moon Camp property in open black oak woodland and under Jeffrey pines. Although restricted to Big Bear and Holcomb Valleys, its regional distribution extends up to the summit of Sugarloaf Mountain south of Big Bear Valley, and as far north as White Mountain, northwest of Holcomb Valley; the taxon is fairly common within its range, and is not considered to be a high priority candidate for listing or more formal protection (Krantz 1983).

Table 1: Special Status Species Occurring on the Moon Camp Property

Arabis parishii	Parish's rock-cress	Fed.: none; S2.1; List 1B.2
Astragalus leucolobus	Bear Valley woollypod	Fed.: none; S2.2; List 1B.2
Castilleja cinerea	Ashy-gray Indian paintbrush	Fed.Threatened; S2.2; List 1B.21B, 2-2-3;
Castilleja applegateii Ssp. *martinii*	Mountain paintbrush	Fed: none; S3.3; List 4.3
Ivesia argyrocoma	Fuzzy rat-tails	Fed: none; S2.2; List 1B.2
Mimulus purpureus	Purple Monkeyflower	Fed: none; S2.2; List 1B.2
Phlox dolichantha	Sugarloaf phlox	Fed: none; S2.2; List 1B.2

Fed. (Federal Rank)
State Rank (S), California Natural Diversity Database
- **S1**: Fewer than six 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 2000-10000
- **S3**: 21-100 occurrences or 3000-10000 individuals or 10000-50000 acres
- **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.

Table 2: Threatened or Endangered Species Determined Not to Occur On Site

Federal Threatened—FT
Federal Endangered—FE

Arenaria ursina	Bear Valley sandwort	FT
Eriogonum kennedyi var. *austromontanum*	Southern mountain buckwheat	FT
Poa atropurpurea	San Bernardino bluegrass	FE
Sidalcea pedata	Bird-foot checkerbloom	FE
Taraxacum californicum	California dandelion	FE
Thelypodium stenopetalum	Slender-petaled thelypodium	FE

VI. RECOMMENDATIONS

A. Establishment of a Conservation Easement and Rare Plant Habitat Preserve

A 4.91-acre rare plant preserve is proposed to be established over the pebble plain habitat. As indicated on the Tentative Tract map, this preserve will protect the most exemplary and best quality of the pebble plain habitat on site, including all seven of the special status species observed on site. A detailed management plan for the preserve area shall be adopted and recorded with the conservation easement, specifying the terms and conditions for allowed and disallowed uses within the preserve area.

The conservation easement shall be conveyed to the San Bernardino Mountains Land Trust or other land stewardship entity, together with a management endowment to cover annual costs of maintenance (replacing signs, mending fences). Interpretive literature, signs, and trails shall be developed for homeowners and visitors to provide an understanding of the sensitive resources occurring in the preserve area.

B. Building Envelopes for Paintbrush Habitat

Construction to the rear portions of Lots 47, 48, 49 and 50 shall be restricted by means of building envelopes or building setback lines, to prevent construction in the occupied ashy-gray paintbrush habitat. The rear portions of these lots abut the Highway 38 frontage, in any case, and are thus largely within the Caltrans right of way and required rear lot setbacks. Lot 50 is constrained by a drainage easement along the eastern length of the parcel, by the Caltrans right-of-way along the highway, and by pebble plain resources.

C. Offsite Compensation for Paintbrush Habitat

Off-site compensation for direct and indirect impacts to ashy-gray Indian paintbrush and pebble plain habitat outside of the 4.91-acre Conservation Easement and not protected by building setbacks (2.57 acres) may be accomplished by acquisition and protection of similar or better habitat resources elsewhere in the valley.

There is a limited amount of privately-held ashy-gray paintbrush and pebble plain habitat available for off-site mitigation. One of the best remaining examples of pebble plain habitat in private ownership that may be used to off-set impacts on the Moon Camp property is the "Sugarloaf pebble plain", situated at the northern terminus of Dixie Lee Lane in the unincorporated community of Sugarloaf. This is a 10-acre, high-quality pebble plain. It was fenced and has been protected from off-highway vehicles since the mid-1980s as a mitigation for construction of the Big Bear High School, the intention being to set aside a 2-acre portion of the 10-acre parcel as mitigation for impacts to pebble plains resources for the High School site, and use the remaining eight acres for mitigation of other projects. The parcel was surveyed by Hicks & Hartwick, but was never formally recorded.

The proposal for off-site mitigation of direct and indirect impacts to ashy-gray paintbrush and pebble plains resources on the Moon Camp property is to acquire fee title interest of the entire Sugarloaf Pebble Plain parcel (less a proposed road easement to accommodate the County's

westerly extension of Baldwin Lane); record the parcel, and convey a Conservation Easement to a responsible stewardship entity, such as the San Bernardino Mountains Land Trust (SBMLT). The conveyance of the easement shall be accompanied by a habitat management and monitoring endowment to be deposited into an escrow account for that purpose. In addition to the initial deposit to establish the habitat management account, Homeowner's Association fees shall be collected annually to provide funding in the long-term. Management guidelines, terms and conditions of the conservation easement shall be clearly defined in a Habitat Management Plan, to be recorded with the easement. These management conditions shall include maintenance of fencing and signs, maintenance of the trail across the pebble plain, and development of interpretive materials for the pebble plains resources.

D. 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, including ashy-gray Indian paintbrush habitat and all six special-status species, into a permanently protected Conservation Easement. The long-term conservation value of the proposed open space requires active onsite land management to prevent "edge effects" from existing and proposed adjacent land uses.

A habitat management plan (HMP) should be developed for the Conservation Easement area. The HMP shall address management of the rare plant preserve with respect to the following indirect impacts:

- Removal and control of invasive non-native plants;
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation;
- Alteration of surface hydrological conditions caused by irrigation on adjacent lots, road runoff, or water diversions installed for erosion control;
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes; and

The HMP shall be administered by the SBMLT or other land stewardship entity. Funding for implementation of habitat management measures shall be derived from interest earned from the habitat management endowment and from annual Homeowner's Association fees.

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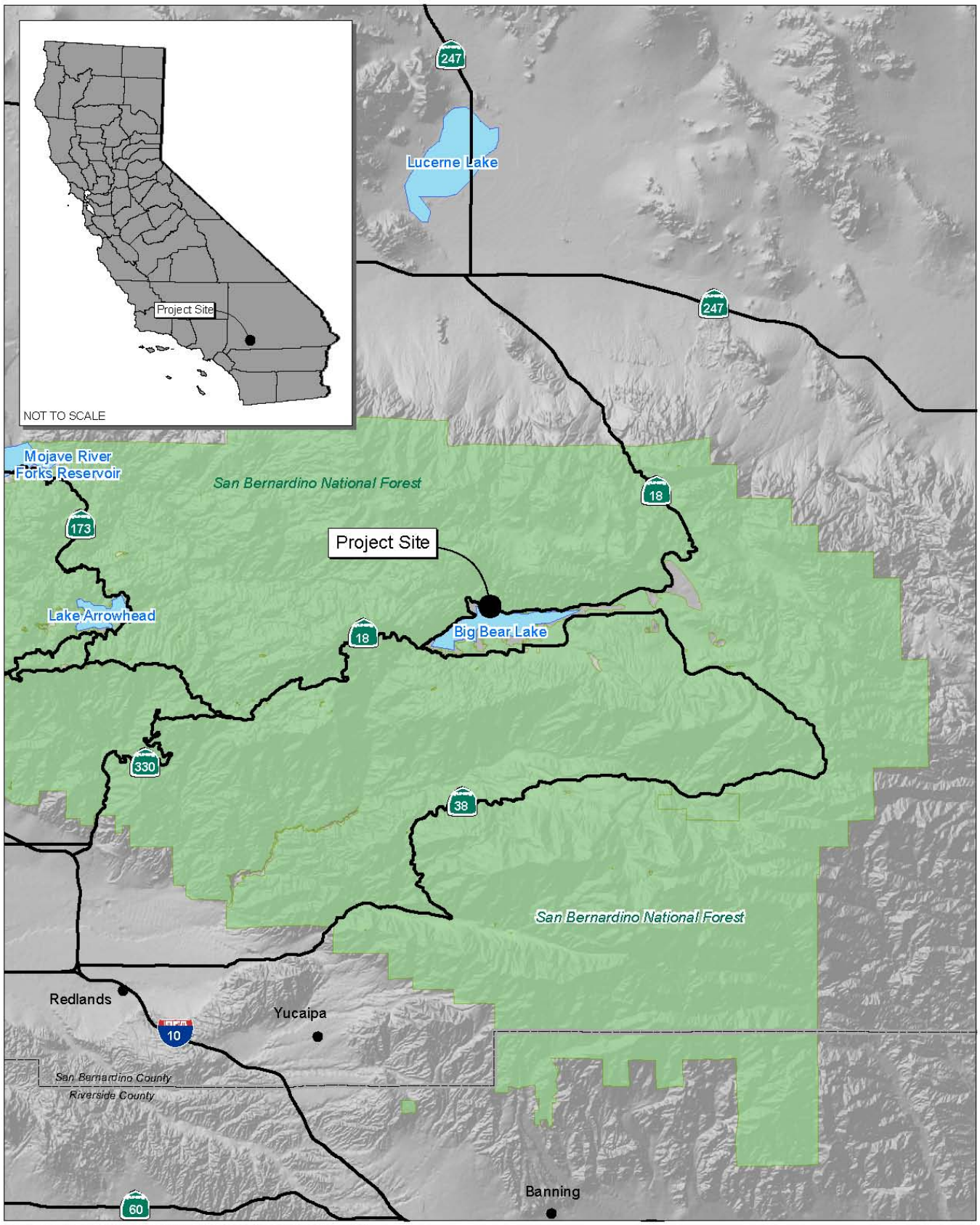
VIII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this supplemental rare plant survey, 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. I certify that I have not signed a nondisclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DATE: June 29, 2008 SIGNED: _____



Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

NORTH

5 2.5 0 5 Miles

Michael Brandman Associates

00520089 • 07/2009 | 1_Krantz_regional.ai

Figure 1
Regional Location Map

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY

Source: Hicks & Hartwick, Inc. (July, 2009).

NORTH

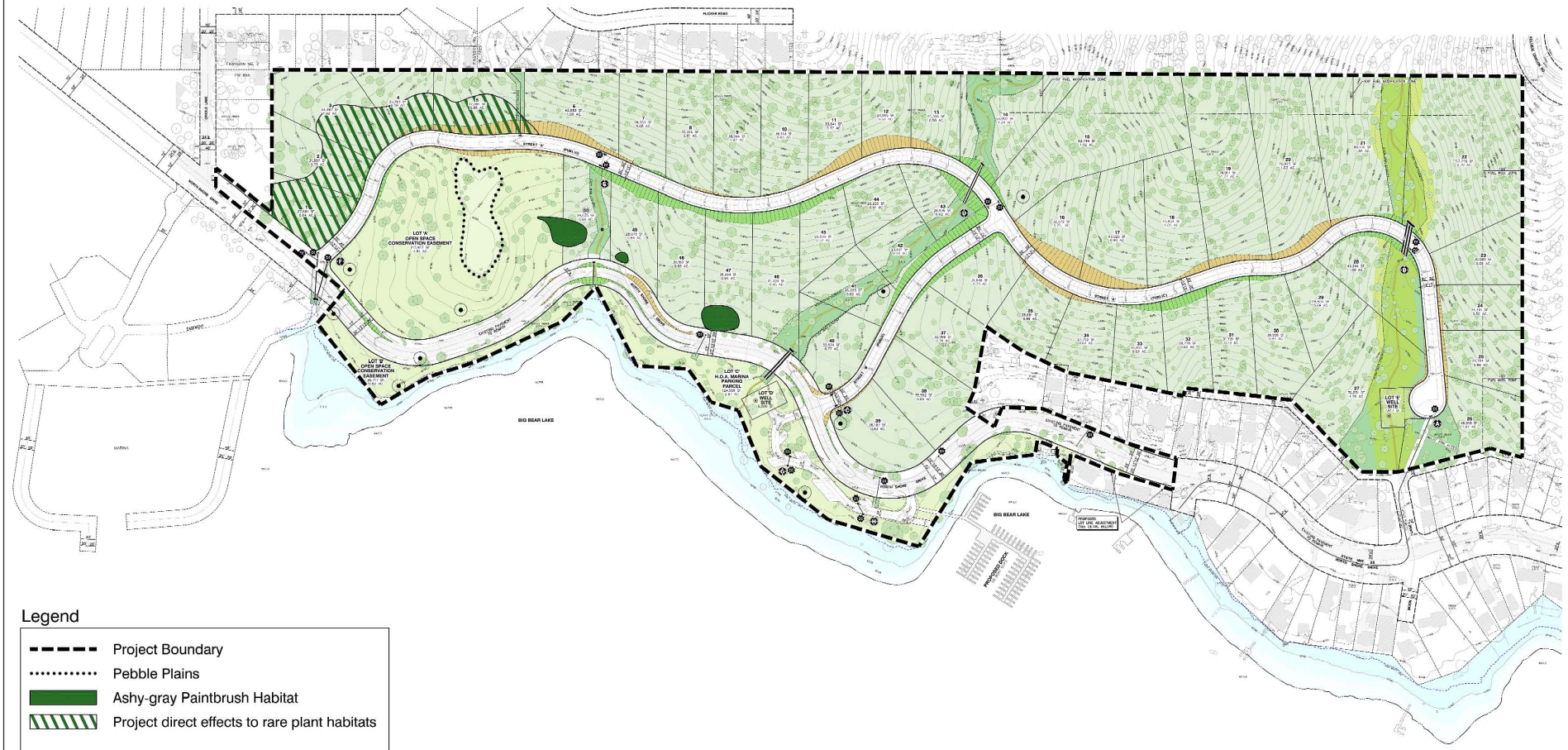
260 130 0 260 Feet

Michael Brandman Associates

00520089 • 07/2009 | 2_Krants_ttm16136.ai

Figure 2
Project Map

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY



Source: Hicks & Hartwick, Inc. (July, 2009) & Tim Krantz, Ph.D (July, 2009).

Michael Brandman Associates

00520089 • 07/2009 | 3_Krants_Pebble_Plain.ai

Figure 3
Map of Pebble Plain and Ash-gray Paintbrush Habitat

A.10 - Southern Rubber Boa Letter Report (Glen Stewart, February 2007)

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

Biological Sciences
College of Science

February 18, 2007

Mr. Michael Perry
California Collaborative Solutions
P. O. Box 706
Big Bear City, CA 92314

Dear Mr. Perry,

This letter reports my observations and evaluation of potential habitat for the Southern Rubber Boa (SRB, *Charina bottae umbratica*), a State of California Threatened Species, on two properties in the Big Bear Lake area on February 9, 2007. Accompanied by you, Lisa Kegarice, and Marni McKernan, I walked the 62 acre "Moon Camp Tract" in Fawnskin between about 11:20 AM and 12:20 PM. After lunch, you and I walked about half of the 160 acre "High Timber Ranch" tract in the Moonridge area, also driving to briefly view two other parts of the tract, between approximately 1:45 PM and 3:15 PM. Lisa and Marni accompanied us for a few minutes at the beginning of our walk there.

The Moon Camp Tract in Fawnskin is immediately adjacent to the north shore of Big Bear Lake and has a south-facing exposure at an elevation of about 6,800 feet. Roughly the western third of the tract is bounded by developed property while the eastern two thirds is bounded by Forest Service land on the north and, I believe, undeveloped private property on the east. The tract is quite dry, sloping unevenly upward to the north and east with a couple of shallow, dry ravines in the eastern portion. In the western portion, the vegetation is composed of an open stand of Jeffrey Pine, with a sparse understory of Great Basin Sagebrush and herbaceous plants. Here, there also is an open "pebble plain" habitat. The stands of pine become somewhat more dense in the eastern part of the tract with larger sagebrush shrubs. Throughout the tract, litter and duff are very thin, but there are a few moderately weathered, medium-sized logs scattered around. Significantly, there are no rock outcrops, which generally are used by SRBs for hibernation sites.

My assessment of the Moon Camp Tract is that it is poor SRB habitat. Further, it is outside of the area mapped as potential SRB habitat in the 1985 Forest Service habitat management guide for the SRB, and there have been no sightings of SRBs reported in the area. My recommendations for mitigating development of the tract are that trees and downed logs be allowed to remain in place, to the extent that clearing is not required by the development process, and that a 50 foot setback be maintained along the deepest ravine at the eastern edge of the property. These measures will serve to protect a limited amount of habitat for native wildlife, such as lizards, snakes, salamanders, chipmunks, mice and wood rats, as well as incidental SRBs.

The High Timber Ranch tract is located on Moonridge, immediately west of Sawmill Canyon and Sugarloaf, with developed property existing along the southwestern boundary. It has a north-facing exposure with several shallow ravines draining to the north-northwest and alternating with gently sloping ridges oriented in the same direction. The crowns of the ridges

are rather flat with small "pebble plain" habitats. Elevation at the upper levels of the property is about 7,200 feet. The vegetation is dominated by fairly open stands of Jeffrey Pine, mixed with small Black Oaks in much of the area. A shrubby understory is present in places, but with little sagebrush. Toward the eastern portion of the property there are occasional Pinyon Pines. Leaf litter and duff are moderately thick where there are Black Oaks, and well weathered medium-sized to large logs are common throughout the site. Significantly, again, no rock outcrops were observed.

My assessment of the High timber Ranch tract is that it is marginally suitable as SRB habitat. The northern exposure, denser vegetation, thicker layers of litter and duff, and greater abundance of large logs provide potential cover for SRBs and other forest floor wildlife. However, the site is outside of the area of potential habitat mapped in the 1985 SRB habitat guide, and no SRBs have been reported in the area. Still, I recommend that the portion of the site that I was not able to survey on foot be surveyed for rock outcrops by an experience field biologist, specifically Lisa Kegarice. Mitigations for development should be similar to those recommended for the Fawnskin site, with 50 foot setbacks along the ravines. If any rock outcrops 10 feet or greater in diameter are discovered in future surveys, they also should be protected by 50 foot setbacks.

I hope that the information and assessments I have provided above are sufficient for your purposes. Please find my invoice enclosed. If you have any questions or concerns, however, please do not hesitate to contact me by e-mail (grstewart@csupomon.edu) or phone (909-869-4093).

Sincerely yours,

Glenn R. Stewart, Ph.D.
Professor Emeritus of Zoology
and Environmental Science

TOM DODSON & ASSOCIATES
2150 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92405
TEL (909) 882-3612 • FAX (909) 882-7015
E-MAIL tda@tdaenv.com

May 1, 2007

Michael Perry
California Collaborative Solutions
P.O. Box 706
Big Bear City, CA 92314

RE: High Timber Ranch Survey

Dear Mr. Perry,

On February 9, 2007 I accompanied you and Dr. Glenn Stewart on a walking survey of the High Timber Ranch Property in the upper Moonridge area of Big Bear Lake. Dr. Stewart was able to survey approximately one half of the High Timber Ranch site that day and provided a February 18, 2007 letter report (attached) detailing his findings.

In his February 18, 2007 letter report, Dr. Stewart recommended that I survey the remainder of the High Timber site on foot to verify the absence of any rock outcrops.

On March 9, 2007, I surveyed the remainder of the site on foot with you and verified that there are no rock crops within the area of the site that Dr. Stewart did not survey on February 9, 2007.

If you need any additional information, please do not hesitate to contact me.

Sincerely,

Lisa Kegarice
Ecologist / Regulatory Specialist

Csp07/0501LK1 (CCS-193)

A.11 - Revised Supplemental Focused Special Status Plant Species Survey (Timothy Krantz, August 2010)

TIMOTHY KRANTZ
Environmental Consulting

MOON CAMP TENTATIVE TRACT 16136

FOCUSED SPECIAL STATUS PLANT SPECIES SURVEY

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Dr. Timothy P. Krantz
Timothy Krantz Environmental Consulting
(a division of Pangaea Nova LLC)
P.O. Box 33
Angelus Oaks, CA 92305

August 29, 2010

Project site location:	USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
Assessors Parcel Nos.:	0304-082-04 and 0304-091-12, 13 and 21
Owner /Applicant:	Tim Wood, RCK Properties, P.O. Box 6820, Big Bear Lake, CA 92315
Principal Investigator:	Dr. Timothy P. Krantz, (909)748-8590

MOON CAMP TENTATIVE TRACT
FOCUSED SPECIAL STATUS PLANT SPECIES SURVEY

TABLE OF CONTENTS

MOON CAMP TENTATIVE TRACT 16136
FOCUSED SPECIAL STATUS PLANT SPECIES SURVEY

I. PURPOSE AND OBJECTIVES

A supplemental botanical survey was conducted to address comments submitted by concerned parties with regard to the Draft Revised and Recirculated Environmental Impact Report for the Moon Camp 50-Lot Residential Subdivision, Tentative Tract 16136. Specifically, this botanical survey focused on clarifying the following information:

- Reconcile differences between the findings of Scott White (White 2007) and Krantz (2008) with regard to the presence or absence of *Castilleja cinerea*;
- Provide additional quantitative and qualitative information with regard to *Castilleja cinerea* (CACI) and any other formally-protected plant species on site;
- Consider potential off-site impacts on the U.S. Forest Service pebble plain known to occur to the northeast of the project site; and
- Provide comparable quantitative and qualitative information with regard to the proposed off-site pebble plain mitigation area located at the terminus of Dixie Lee Lane.

These findings augment the Supplemental Focused Rare Plant Survey conducted by Dr. Krantz, dated June 29, 2008, providing an additional above-average precipitation year for observation. Particular attention was given to assessing the distribution and abundance of CACI—as this is the only formally-listed rare plant species identified on the Moon Camp property.

II. METHODOLOGY

The San Bernardino County Planning Department is reviewing a Revised and Recirculated Draft Environmental Impact Report for the Moon Camp 50-lot residential subdivision, Tentative Tract 16136. The project site is on the north shore of Big Bear Lake, in the eastern part of the community of Fawnskin, on unincorporated land in San Bernardino County. The project site is comprised of about 62 acres, situated on both sides of State Highway 38, between Canyon Road 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 Figures 1 and 2).

The Moon Camp property was surveyed on June 11, 26 and 27, and on July 27, 2010. The focus of the 2010 surveys was on the previously identified occupied habitat areas of CACI. The bench-top openings to the southeast of the property that were previously and erroneously identified as CACI habitat by the White surveys of 2007 (as discussed in Krantz 2008) were also re-visited; and the pebble plain situated on U.S. Forest Service property northeast of the Moon Camp property was also surveyed.

The Dixie Lee Lane pebble plain, proposed as off-site mitigation, was also examined, and line transects were tabulated across the habitat to determine abundance of *Castilleja cinerea*, *Arenaria ursina* and *Eriogonum kennedyi austromontanum* at that location.

III. DISCREPANCY BETWEEN FINDINGS OF WHITE (2007) AND KRANTZ (2008)

As discussed in the Krantz (2008) botanical report for the Moon Camp property, the previous findings of Scott White (2007) were found to be erroneous with respect to identifying two occurrences of CACI habitat located to the southeast portion of the property. The discussion of this discrepancy is cited below:

> Ashy-gray paintbrush (*Castilleja cinerea*) had been mapped as four distinct occurrences by White, but the author, in conjunction with this survey, found that the two eastern occurrences, indicated as occurring behind (north of) Lots 22, and 29-30-31, do not support any ashy-gray paintbrush plants. There were openings of Wright's matting buckwheat at these locations, with silver rat-tails (*Ivesia argyrocoma*), which is sometimes associated with pebble plains, and Heckard's paintbrush (*Castilleja montigena*) was found on the perimeter of the openings, but no ashy-gray paintbrush exists at those locations. To verify that the author was, indeed, at the proper locations, the areas considered to be concurrent with those areas indicated by White were delineated with GPS data points to confirm the negative findings.
>
> Similarly, the GPS delineation of the middle ashy-gray paintbrush occurrence was found to be less than one-third the size of the occupied habitat indicated in the White survey. This occurrence corresponds to the southernmost portions of proposed Lots 47 and 48, adjoining Highway 18. In this case, it appeared that White had mapped the Wright's matting buckwheat distribution, without regard to association with the ashy-gray paintbrush.
>
> The primary pebble plain (the westernmost occurrence according to White) was found to be more restricted than indicated by White at the eastern portion of the occurrence, but generally conformed to the area indicated by White in the area of the central pebble plain (within the proposed rare plant preserve) and toward the western portion of the pebble plain and ashy-gray paintbrush area.

All areas identified by White as containing CACI were re-visited during this 2010 survey. Once again, no CACI was found to occur at the two southeasterly sites, and the middle occurrence was confirmed as delineated in the 2008 survey. The general distribution of the westerly CACI occurrence was approximately the same as in both the White and Krantz (2008) surveys; and further delineating and quantifying the CACI within this westerly occurrence was the primary focus of this 2010 survey.

IV. FOCUSED SURVEY OF *CASTILLEJA CINEREA*

One of the primary objectives of this botanical survey was to complete a more definitive assessment of the Federally-Threatened plant species—*Castilleja cinerea*—otherwise known as the ashy-grey Indian paintbrush. *Castilleja cinerea* (henceforth, CACI) is endemic to the northeast San Bernardino Mountains, with an overall distribution ranging from Snow Valley (1,828m a.s.l.) to the west, Holcomb Valley to the north, through Big Bear Valley to Baldwin Lake, thence southeast to Onyx Peak, and west along Sugarloaf Ridge, extending up to 3,032m (9,950 feet) above sea level. It occurs mostly in association with pebble plains habitat, but also basin sagebrush scrub, yellow pine, and lodgepole pine forest. On the Moon Camp property, CACI occurs in the yellow pine forest (*Pinus jeffreyi)* plant community.

CACI is a perennial plant, and therefore, should be identifiable in the appropriate season year after year. It is a hemiparasite, that is, it is at least partially parasitic on host plants for nutrients. CACI is usually associated with one of several buckwheat (*Eriogonum*) or mugwort (*Artemisia*) species. On pebble plains it is usually associated with Kennedy's buckwheat (*Eriogonum kennedyi* subspecies), but this pebble plains indicator species does not occur on site. In the case of Moon Camp, CACI is associated with *Eriogonum wrightii subscaposum* (Wright's matting buckwheat) and perhaps occasionally on *Artemisia ludoviciana* or *A. tridentata.*

Based upon the initial field survey results of June, 2010, high densities of CACI plants were observed on the westernmost Lots in the area west of "Street A"—the public roadway through the property. Densities as high as seven (7) CACI plants per square meter were tabulated in a very dense occurrence extending across the originally-enumerated Lots 1, 2 and 3. After consultation with the Applicant's Representative and the Environmental Impact Report consultant team, the original Lot configuration was revised to create a new Lot "H" Open Space Conservation Easement over the original Lots 1-3; and three new Lots 1-3 were designated along the south side of Street "A", with much lower densities of CACI.

The results of these quantitative CACI surveys are summarized below.

<u>Confirmation of Absence of CACI at Eastern Locations</u>

Scott White identified two eastern occurrences of CACI in his 2007 botanical report, indicated as occurring behind (north of) Lots 22, and 29-30-31 of the adjacent existing residential tract (White 2007). These were found to not support any ashy-gray paintbrush plants by Krantz in 2008; and their absence was confirmed during this survey. In both cases, Wright's matting buckwheat is present and widespread in the openings corresponding to White's locations, but there are no CACI plants, and nothing that could be mistaken for CACI (*Castilleja montigena* was observed at the edges of one of the locations). One can only assume that because 2007 was a record drought year, White had simply mapped the distribution of Wright's matting buckwheat and recorded the locations because of their potential for CACI; however, there is no question that these locations do not harbor any CACI plants now, nor did they in 2007. Because CACI is a perennial plant, these

occurrences do not "come and go" year to year, depending upon seasonal rainfall (or lack thereof), as annual plants sometimes do.

Discrete Occurrences of CACI

Occurrences of CACI identified by Krantz (2008) were confirmed during this survey, including approximately 50 plants at the location at the rear of proposed Lots 47-48; nine plants at the rear of Lot 49; and three plants on the west bank of the swale at the rear of Lot 50. A recent large tree-fall above the swale may alter the exposure and drainage pattern immediately around the swale, but the three CACI plants were still observed at this location at this time.

Open Space Lot A

A discrete count of the CACI plants occurring on Lot A was conducted by systematically walking the surrounding area of the knoll at this location. Altogether, a total of ~230 CACI plants were tallied within the Lot A area.

Open Space Lot H

The newly-proposed Lot H Open Space Conservation Easement was created to protect the high densities of CACI occurring in this area. The highest concentration of these plants extends in a broad opening in the Jeffrey pine woodland, in association with Wright's matting buckwheat. Altogether, approximately 4,665 CACI plants were estimated to occur in this area based on a combination of discrete counts and a belt transect through the middle of the highest density area.

Lots 1-5, Road Easement and Well Lot F

Discrete tallies of CACI plants were conducted on Lots 1-5 of the revised Moon Camp subdivision, including the new Lots 1, 2, and 3. The new Lot 1 contains approximately 45 plants, all located within a 5m-radius of the southeast corner of the property. Although these plants are within the rear-lot and side-lot building setbacks, they are considered as a "take" because they are not included in the Conservation Easement areas.

CACI plants on the new Lot 2 are scattered across the Lot, with approximately 150 plants.

The new Lot 3 contains approximately 175 plants. Lot 4 contains approximately 70 plants to the front-center of the Lot, and another 20 plants to rear of the Lot (not in the buildable area of the Lot), for a total of ~90 plants; and Lot 5 contains approximately 30 plants and another ~40 CACI plants are in the road right-of-way across the front of Lot 5. Well Site Lot F and the associated access road contain approximately 80 plants.

Summary of CACI Occurrence on the Moon Camp Site

Altogether, then, one finds these total estimated numbers of CACI plants on the Moon Camp property:

Lot 1— 45 plants
Lot 2— 150 plants
Lot 3— 175 plants
Lot 4— 90 plants
Lot 5— 30 plants
Lot 47— 50 plants
Lot 49— 9 plants

Lot 50— 3 plants
Lot A— 230 plants
Lot F— 80 plants
Road ROW- 40 plants
Lot H— 4,665 plants

TOTAL 5,567 plants

Of the 5,567 CACI plants estimated to occur on site, 4,895 plants will be protected within Lot A and H, representing 88% of the total number of plants. Of the remaining CACI plants on private Lots, plants within Lots 1, 47, 49, and 50 are all within the rear Lot building setbacks, as well as 20 plants on Lot 4, for a total of 127 plants; however, these are still considered as "take" specimens because they are not within formally-protected Conservation Easements on the property.

V. SURVEY OF THE U.S. FOREST SERVICE POLIQUE CANYON PEBBLE PLAIN

A survey was conducted of the pebble plain located on U.S.F.S. property, located generally within the NE/4 of the SE/4 of Section 12, Range 1 West, Township 2 North, San Bernardino Baseline and Meridian.

The Polique Canyon pebble plain is situated along a bench-top ridge northeast of the Moon Camp project site. The ridge runs generally north-to-south for a distance of about 290 meters (950 feet), with two small openings of approximately one acre each that support pebble plains vegetation. These are true pebble plains, with both of the indicator species—*Eriogonum kennedyi austromontanum* and *Arenaria ursina*—used to map the distribution of pebble plains habitat (Krantz 1981). Other associated pebble plains species include *Arabis parishii, Erigeron aphanactis, Ivesia argyrocoma* and *Lewisia rediviva.*

The pebble plain exhibited the impacts of off-highway vehicle use, with a motorcycle track that runs the entire length of the bench top, with access to the pebble plains from the northwest toward the residential subdivision in that direction, and to the northeast, where the motorcycle track connects with Polique Canyon Road. The Forest Service has placed logs and branches across the northern entry to the motorcycle track to prevent vehicular access to the pebble plains, with some success, as there was no evidence of recent motorcycle activity on the pebble plains.

The Polique Canyon pebble plains are situated approximately 325m (1,056 feet) northeast of the Moon Camp property, at an elevation of about 60m (200 feet) above the project. Forest Service comments on the Revised and Re-circulated DEIR expressed concern that development of the Moon Camp property could represent an indirect impact to the pebble plains from foot traffic generated by the Moon Camp residents. There is no apparent footpath or trail connection between the Moon Camp property and the pebble plains. For Moon Camp residents to hike up to the pebble plains, they would have to traverse up the 300+ meter-ridge with a 60m-elevation gain across the brush-covered slope.

VI. SURVEY OF THE DIXIE LEE LANE PEBBLE PLAIN

The Dixie Lee Lane pebble plain is situated at the northern terminus of the street of the same name at the northwest corner of the community of Sugarloaf. It is a ten-acre, discrete pebble plain situated in a pinyon-juniper/Jeffrey pine woodland. It is one of a series of bench-top pebble plains extending from Upper Moonridge and the U.S.F.S.-owned Sawmill pebble plain on the west, to the once-expansive pebble plain situated on either side of Maple Lane road leading into the community of Sugarloaf from Big Bear City.

The Dixie Lee Lane pebble plain was originally proposed as a mitigation bank for the partial offset of impacts of development of the Big Bear High School on Maple Lane, which was formerly the site of a large pebble plain of the Sugarloaf series. The development of the High School required a Minor Subdivision of the parent parcel, including the Dixie Lee Lane pebble plain. At the time, pebble plains and their associated species were not formally listed or protected as endangered or threatened species; and the establishment of an off-site mitigation bank for the High School was considered adequate mitigation for the impacts of the High School project. The complete 10-acre

pebble plain was surveyed by Hicks & Hartwick Engineering, with the idea that two acres of the 10-acre pebble plain would be used to mitigate for the High School, and the remainder would be available for mitigation of other projects with pebble plain-related impacts. However, the 10-acre mitigation bank and two-acre subdivisions of it were never actually recorded.

The Moon Camp project is proposing to establish permanent protection of the entire 10-acre pebble plain at Dixie Lee Lane as part of their rare plant mitigation program. This supplemental botanical survey focused on providing a quantitative and qualitative assessment of the proposed Dixie Lee Lane pebble plain.

Survey Results

Three belt transects were tallied on the Dixie Lee Lane pebble plain to determine approximate densities of the three Federal-Threatened plant species that occur there: *Arenaria ursina* (ARUR), *Eriogonum kennedyi austromontanum* (ERKEA) and *Castilleja cinerea* (CACI), with the following results.

The Dixie Lee Lane pebble plain is a textbook example of this unique rare plant community. The original "type" pebble plain was described by Derby and Wilson (1978) based upon the Sawmill pebble plain—one of the Sugarloaf series of pebble plains situated two bench tops to the west of the Dixie Lee Lane population. The Dixie Lee Lane occurrence has relatively discrete borders with the surrounding pinyon-juniper-Jeffrey pine forest, indicating the dense clay substrate that prevents the competing pine seedlings from becoming established on the open plain. The surface of the pebble plain exhibits the classic vestiture of Saragossa quartzite pebbles and cobbles resulting from frost heave of the pebbles during winter freezing and thawing cycles of the clay soil, resulting in the pebbles being pushed to the surface of the clay.

The dominant species on the pebble plain are the two Federal-Threatened Big Bear-area endemics—ARUR and ERKEA—with the full suite of associated plant species, including several other Big Bear endemics and other rare plants found almost exclusively on pebble plain habitats, including the following:

Antennaria dimorpha		
Arabis parishii	Big Bear endemic	CNPS List 1B.2
Arenaria ursina	Big Bear endemic	Federal Threatened
Castilleja cinerea	Big Bear endemic	Federal Threatened
Cusickiella douglasii c.		
Erigeron aphanactis		
Eriogonum kennedyi a.	Big Bear endemic	Federal Threatened
Ivesia argyrocoma	SB Mts and Baja C.	CNPS List 1B.2
Lewisia rediviva minor		
Linanthuskillipii	Big Bear endemic	CNPS List 1B.2
Mimulus purpureus	BB near-endemic	CNPS List 1B.2

The three belt transects were established accordingly: one in the northern pebble plain opening, one across the middle opening, and one through the southern (entry from Dixie Lee Lane) opening. The transects were extended to 50m-lengths, and ten meter-square plots were tallied at 5m intervals along the transects, alternating right- to left-of-center line meter-squares to randomize the meters

selected for counting. The Federal-listed species were counted with regard to the number of mature (flowering or woody stems) and seedling plants per meter-square.

A total of 128 ARUR plants were tallied in the 30 meter-square plots, for an average density of 4.3 plants per square meter. ERKEA plants exhibited a total of 475 flowering plants (and at times countless seedlings/m2!) in the 30 meter-square plots, for an average density of 15.8 plants per square meter. CACI was infrequent on the pebble plain, with only 21 plants tallied, limited to the north end of the pebble plain along the northeast edge of the opening. These plants were all in association with ERKEA.

A large number of ERKEA plants were observed to be recently dead or dying in the area of the pebble plain with the CACI, and in several other areas, with as many as 8.9 dead ERKEA crowns/m2 in the transect near the CACI occurrence. Some areas not sampled in the transects exhibited nearly 100% ERKEA mortality. These areas were associated with a high density of introduced cheat grass, *Bromus tectorum*. Similar ERKEA die-offs were observed by the author earlier this season at North Baldwin Lake; and this worrisome qualitative condition may deserve further evaluation with regard to pebble plain conservation.

Extrapolating these densities of the Federal-Threatened pebble plains indicator species across the entire Dixie Lee Lane pebble plain, one arrives at a total population for ARUR and ERKEA in the tens of thousands. To the best of the author's knowledge, this represents the highest densities of pebble plains species remaining on privately-owned land in Big Bear Valley.

VI. SUMMARY OF FINDINGS

The objectives of this supplemental botanical survey of the Moon Camp property were addressed as follows in the brief summary of findings described below.

The areas of discrepancy of reported CACI occurrence between the Scott White reports (2002 and 2007) and the Krantz supplemental report (2008) were revisited in the field, and the findings of the Krantz report were confirmed. There are no CACI plants on the two easterly occurrences reported by White.

The other CACI occurrences were confirmed in the field, the aerial extent of the occurrences were delineated, and numbers of CACI plants were discretely counted where possible, or estimated via quantitative transects in the larger occurrences. Altogether, a total of 5,567 CACI plants were estimated to occur on the Moon Camp property. Of these, 4,895 plants will be conserved within the Conservation Easements on Lot A and Lot H, representing 88% of the entire Moon Camp population. Lot H will represent the first formally-designated conservation easement dedicated to the preservation of this unique species.

The Polique Canyon pebble plain, situated on Forest Service land above and to the northeast of the Moon Camp property was surveyed, and was found to represent a true pebble plain ensemble of species, including the two indicator species, *Arenaria ursina* and *Eriogonum kennedyi austromontanum.* The Polique Canyon pebble plain has experienced impacts from unauthorized motorcycle activity in the recent past, with a motorcycle track running through the pebble plain from the Polique Canyon road area. The Forest Service has attempted to block this illegal off-

highway vehicle activity by laying branches and logs across the track, with apparent success. No impacts from existing adjacent pedestrian traffic were observed on the pebble plain. No off-site, indirect impacts of pedestrian foot traffic is anticipated from the Moon Camp property, as Moon Camp is more than 1,000 feet south of the Polique Canyon pebble plains, separated by brush without an established trail, and is several hundred feet in elevation below the pebble plains.

The "pebble plain" on Lot A, as identified in previous botanical reports by White *et alus*, has some of the soil characteristics of a pebble plain, but lacks the two indicator threatened plant species (*Eriogonum kennedyi austromontanum* and *Arenaria ursina*). Therefore there is technically no pebble plain on the property that requires mitigation.

The Dixie Lee Lane pebble plain, proposed for off-site mitigation of the Moon Camp project, was surveyed, and quantitative belt transects were tallied to estimate the abundance of Federal-Threatened species at that location. This ten-acre pebble plain exhibits very high densities of the two indicator species (mentioned above), with an estimated population in the tens of thousands for these two Federal-Threatened species. CACI was found to be poorly represented on the Dixie Lee Lane parcel, however, with only 21 plants observed.

VIII. REFERENCES

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Appendix B:
Water Feasibility Studies

B.1 - Recommended Alternative for DWP (Alda Engineering Inc., February 2011)

ALDA Engineering Inc.
5928 Vineyard Avenue
Alta Loma, CA 91701
Tel: (909) 587-9916
Fax: (909) 498-0423

February 7, 2011

Bill La Haye, Water Resources Manager
Big Bear Lake Department of Water & Power
41972 Garstin Drive
Big Bear Lake, CA 92315

Subject: **Moon Camp Development Project – Tentative Tract 16136**
Recommended Alternative to Provide Water Service

Dear Mr. La Haye:

The purpose of this letter is to document the recommended alternative to serve the proposed Moon Camp Development Project in the Fawnskin area. Initially, two alternatives to serve this development were documented in our March 2007 Feasibility Study. Both alternatives considered serving the development off the Upper Fawnskin pressure zone and differ from each other on the alignment of recommended transmission facilities and the size of pumping units.

The recommended alternative (Alternative "B") consists of serving the proposed development by gravity off the existing Racoon Reservoir. Initially, this alternative included the replacement of two undersized pipeline segments that were built along property lines; thus requiring a construction and operations easement. Since the recommended alternative was initially configured, it has been determined that construction along one of these segments will be extremely difficult due to the steepness of the terrain; hence new alignment had to be selected along Ridge Road. Figure 1 illustrates the revised alignment for the recommended alternative; facility requirements to implement this alternative are listed below.

- 900 ft of 12-inch pipeline along Ridge Road from the intersection of Raccoon Drive south to tie to an existing 8-inch PVC pipeline on a private easement.
- 200 ft of 12-inch pipeline along private easement to connect Fawnskin Drive and Canyon Road
- 650 ft of 12-inch pipeline along Canyon Road to Chinook Road
- 600 ft of 12-inch pipeline along Chinook Road to Flicker Road
- 500 ft of 12-inch pipeline along Flicker Road to Mesquite Drive
- 400 ft of 12-inch pipeline along Mesquite Road to North Shore Drive
- 250 ft of 12-inch pipeline along North Shore Drive to development westerly boundary