
**PROPOSED SENTINEL QUARRY EXPANSION:
BIOLOGICAL RESOURCES**

August 21, 1997

Prepared for:

**PLUESS-STAUFER (CALIFORNIA), INC.
P.O. Box 825
Lucerne Valley, California 92356**

Prepared by:

**PSOMAS AND ASSOCIATES
1387 Red Hill Avenue, Suite 250
Costa Mesa, California 92626
Project No. 2PLU0102**

PROPOSED SENTINEL QUARRY EXPANSION: BIOLOGICAL RESOURCES

Scott D. White
PSOMAS AND ASSOCIATES
21 August 1997

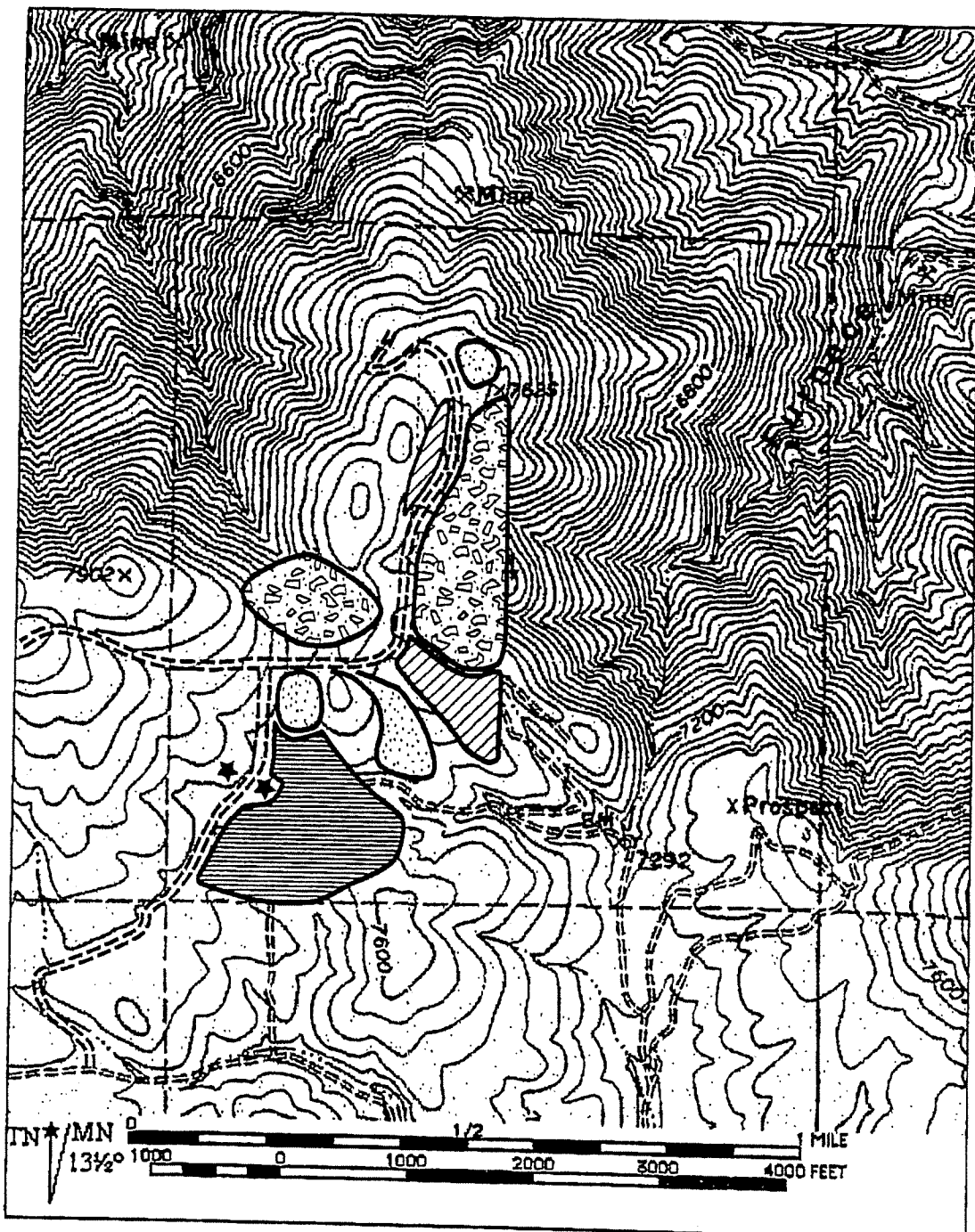
INTRODUCTION

This report was contracted by Pluess-Stauffer (California), Inc. (PSC) to evaluate biological resources on three areas proposed for expansion at PSC's Sentinel limestone quarry and associated facilities. The project site is in Township 3 North, Range 1 West, Sections 24 and 25, San Bernardino Baseline and Meridian, shown on the USGS Fawnskin 7½' quadrangle (Maps 1 and 2). The proposed quarry expansion sites are (1) about 8 acres directly south of the crushing site of the existing Sentinel quarry and (2) about 2 acres west of the existing quarry and haul road. The proposed new overburden site is on about 30 acres south of the existing Butterfield 5 Pad and Blackhole overburden sites, and east of the Claudia haul road. These proposed expansion areas are on public land within the San Bernardino National Forest (SBNF; Map 1).

The three sites range in elevation from about 7450 to 7650 feet. Dominant vegetation on the three sites matches the Singleleaf pinyon (*Pinus monophylla*) series described by Sawyer and Keeler-Wolf (1995), with western juniper (*Juniperus occidentalis*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), and rabbitbrush (*Chrysothamnus viscidiflorus*; *C. parryi*) as common associates. The two proposed quarry expansions areas are on relatively steep slopes, in the headwaters of the Furnace Canyon watershed. Thin carbonate-derived soil overlays carbonate bedrock, and scattered carbonate outcrops occur at both sites.






The proposed overburden site is on a more gently sloping minor canyon which ultimately drains into the headwaters of Holcomb Creek. Soils are deeper, and are largely alluvial in origin. In some areas, soils appear to be largely of carbonate material; in others, soils are composed mostly of igneous material. Igneous soils are especially prevalent in the southern and eastern part of the proposed overburden area, and generally support the Jeffrey pine (*Pinus jeffreyi*) series (Sawyer and Keeler-Wolf 1995) with white fir (*Abies concolor*), serviceberry (*Amelanchier utahensis*), and Great Basin sagebrush (*Artemisia tridentata*) as common associates.

The SBNF Land and Resource Management Plan (LRMP; 1988) includes the sites within the Back Country Management Area and maps it within a "watershed" management emphasis zone. According to the LRMP, the SBNF will administer mining operations, and "Plans of operation and appropriate mitigation and reclamation measures will be required for significant ground-disturbing activities. Viable populations of sensitive plants will be identified and protected through special measures." The LRMP prescribes management "to maintain habitat conditions for emphasis species," "to retain meadow and grassy openings," and "to maintain a mix of hardwoods



Map 1: Site Map - Proposed and Existing Conditions



- LEGEND**
-  Existing Quarry
 -  Existing Overburden
 -  Proposed Quarry Expansion
 -  Proposed Overburden
 -  Cushenbury oxytheca location

Biological Resources
Proposed Sentinel Quarry Expansion

and conifer[s] . . . consistent with the site potential to support hardwoods" in watershed emphasis zones.

METHODS

Scott D. White reviewed available literature to identify special status plants, animals, and natural communities known from the area. Material reviewed included the California Natural Diversity Data Base (CNDDB), the US Forest Service's lists of sensitive plants and animals, compendia of listed species, candidate species, and species of concern compiled by the US Fish and Wildlife Service and the California Department of Fish and Game, and the California Native Plant Society's *Electronic Inventory of Rare and Endangered Vascular Plants of California*. Appendix 1 lists special status species occurring in the general area, summarizes their habitat, geographic range, agency status, and occurrence probability on the site.

White visited the project site on 2 and 3 June and 3 July 1997 to carry out focused surveys for special status plants, particularly the listed carbonate-endemic species. A total of about 16 person-hours were spent carefully surveying the two proposed quarry expansion areas and the proposed overburden site. All species recognized during the survey were recorded in field notes; plants not recognized in the field were collected and subsequently identified from keys, descriptions, and illustrations in Abrams (1923, 1944, 1951), Abrams and Ferris (1960), Hickman (1993), Munz (1974) and Sanders et. al. (1995). Many of these identifications were made or confirmed by Andrew C. Sanders (Herbarium Botanist, Department of Botany and Plant Sciences, University of California Riverside). A list of all plant species noted on the site is included in Appendix 2.

SPECIAL STATUS SPECIES

Plants and animals are ranked in special status categories due to declining populations, restricted distributions, or perceived vulnerability to habitat change. Some species are listed as threatened or endangered under state or federal Endangered Species Acts. Others are ranked as candidates for listing or are recommended for other special consideration. A total of 58 special status species (35 plants, 4 reptiles and amphibians, 10 birds, and 9 mammals) were considered for this report (Appendix 1).

Plants

One federally listed endangered species, Cushenbury oxytheca (*Oxytheca parishii* var. *goodmaniana*) occurs to the west of and adjacent to the proposed overburden site, but not within it (Map 2). It occurs in open pinyon and juniper woodland, on relatively deep fine-sandy carbonate soils, generally in scattered patches of 100 or more plants each, in microhabitats where little organic material overlies the soil surface, and soils are not at all compacted. It is commonly associated with southern mountain phlox (*Phlox austromontana*) and gilia (*Gilia* sp.), though these species are much more widespread on the site than Cushenbury oxytheca. Note that the open character of the forest overstory here is due in large part to timber harvesting, evidenced by

cut juniper stumps, scattered slash piles, and abandoned roads and trails. The site was apparently disturbed by timber harvest some 20 or more years ago; Cushenbury oxytheca was not seen on abandoned roads or trails, or associated with slash piles. Instead, it was seen in open areas, away from trees and leaf litter. It is unclear whether forest thinning may have expanded or reduced its habitat. The total number of Cushenbury oxytheca seen during field surveys was roughly estimated at a few thousand individual plants. Elsewhere, observations of this species have suggested that its numbers fluctuate widely from year to year (Psomas and Associates 1996); we cannot determine whether the numbers seen this year are high, low, or average for this population based on the observations reported here.

Five other special status plant species were also observed on the project site. Parish's rock cress (*Arabis parishii*) occurs very scarcely on the proposed western quarry expansion area, in thin carbonate soil over limestone bedrock. Pine green gentian (*Swertia neglecta*) occurs occasionally on the proposed overburden site. Transverse Range phacelia (*Phacelia exilis*) is scarce on the proposed overburden site. San Bernardino Mountain buckwheat (*Eriogonum microthecum* var. *corymbosoides*) and Heckard's paintbrush (*Castilleja montigena*) occur occasionally to commonly on all three sites. Parish's rock cress is managed by the SBNF as a sensitive species; the other special status plants occurring on the site are not included in the Forest's sensitive plant list. Based on the field survey results, Psomas and Associates concludes that other special status plants occurring in the region are absent from the proposed project site.

Animals

Arid coniferous forest and woodland on and near the project site provide suitable habitat for several sensitive animals. Nelson's bighorn sheep (*Ovis canadensis nelsoni*), mule deer (*Odocoileus hemionus*), and mountain lion (*Felis concolor*) (all SBNF Management Emphasis Species, though not ranked as sensitive) occur in the area. Bighorn sheep sign is common on the quarry expansion sites; similar sign, but less-certainly attributed to bighorn, was also seen in the proposed overburden site. Sign of American badger (*Taxidea taxus*) were observed on the proposed western quarry expansion site. Mule deer sign was seen occasionally in the proposed overburden area. Southern sagebrush lizard (*Sceloporus graciosus vandenbergianus*) was observed at all three sites. Gray vireo (*Vireo vicinior*) and mountain quail (*Oreotyx pictus*) have been reported near the proposed new overburden area (Myers 1988) but were not observed during field surveys reported here. Habitat is suitable for hepatic tanager (*Piranga flava*), which occurs uncommonly in the northern San Bernardino Mountains (Garrett and Dunn 1981), though it is unlikely to occur on the site due to its local rarity.

Nine special-status bat species have been recorded in southern California. Several of these occur only in lowlands, or as aberrant records. Of the five species listed in Appendix 1, only the pallid big-eared bat and California mastiff bat have been confirmed occurring in the San Bernardino Mountains, though to date survey efforts have not focused on rock outcrops where other species could occur (Lisa Underwood, Robin Butler; pers. comm.). Any of the five species could forage over the area. California mastiff bat (*Eumops perotis californicus*), pallid bat (*Antrozous pallidus*), occult little brown bat (*Myotis lucifugus occultus*), and big free-tailed bat (*Nyctinomops macrotis*) may use rock crevices for day roosting. Pallid big-eared bat (*Plecotus*

townsendii pallescens) roosts in tunnels and mines; it would not likely use crevices and no abandoned tunnels are known in the area. Thus, there is the possibility that any of several special status bat species could occur on the site, but the absence of tunnels or other suitable communal roost sites indicates that the proposed project would not eliminate a significant or limiting resource for sensitive bat populations.

PROJECT IMPACTS

The proposed quarry expansions would not directly affect listed threatened or endangered plant species. Quarry expansions would affect the following special-status plants occurring on the site:

Parish's rock cress: a few plants on the proposed western quarry expansion area would be lost. This species is managed as a Sensitive Plant by the San Bernardino National Forest, but is not listed as threatened or endangered by state or federal endangered species acts. Its range is limited to the Big Bear and Holcomb Valley area, and this location is at or near its northern range limit. It is "abundant on pebble plains, but also on carbonate and in other habitats" (Sanders et. al. 1995). A botanical review for this species was prepared by Krantz (1978) and reviewed by SBNF staff (Derby 1978). The Forest Service preliminary review determined that then-proposed mining activities would not significantly impact the species, and that noteworthy elements of the "North Ridge" population (i.e., occurrence on limestone soils and its location north of the remainder of the plant's distribution) were adequately represented by other populations. The loss of a few plants on the quarry expansion site would not be likely to significantly affect the species' long-term viability.

Pine green gentian: a few plants would be lost at the proposed overburden site. This species has no formal status with state or federal agencies, but is on the CNPS watch list. It is widespread in the pine forest understory, and not closely associated with particular substrates or habitats. Loss of these plants would not be significant in terms of CEQA or forest management.

Transverse Range phacelia: A few plants would be lost at the proposed overburden site. This species is rarely collected but widespread in the Transverse Ranges and southern Sierra Nevada. It has no formal status with state or federal agencies, but is on the CNPS watch list. Loss of these plants would not be significant in terms of CEQA or forest management.

San Bernardino Mountain buckwheat: Plants would be lost at all three sites. This plant is common on carbonate soils throughout the region, at elevations above about 6000 ft. (Sanders et. al. 1995). It has no formal status with state or federal agencies, but is on the CNPS watch list. Loss of these plants would not be significant in terms of CEQA or forest management.

Heckard's paintbrush: Plants would be lost at all three sites. It is not clear whether this plant should be recognized as a distinct species. It evidently is a result of hybridization between two common paintbrush species (*Castilleja applegatei* and *C. angustifolia*; Heckard et. al. 1980). It has formerly been recognized as a subspecies (Munz 1974); Heckard and coworkers recognized it as a distinct species in their 1980 report but in the Jepson Manual (Hickman 1993), Heckard and

Chuang mention it only in passing in their discussions of parent species. CNPS continues to recognize Heckard's paintbrush on its watch list, but it is not included in special status plant compendia maintained by other agencies. Regardless of its proper rank as a species, subspecies, or hybrid, the plant is common throughout the San Bernardino Mountains, and loss of plants from the project site would not be significant in terms of CEQA or forest management.

No animals listed or proposed for listing under state or federal Endangered Species Acts are likely to use the project site, but several special status species occur or are expected (Appendix 1). These include southern sagebrush lizard, San Bernardino Mountain kingsnake, mountain quail, gray vireo, flammulated owl, American badger, and perhaps one or more bat species.

In addition, three Management Emphasis Species (mountain lion, Nelson's bighorn sheep, and mule deer) may be affected by quarry expansion. Nelson's bighorn sheep and mule deer are regularly sighted along PSC haul roads and apparently have not been adversely affected by the existing mining operation. There is little information available on the response of mountain lion and mule deer to quarry operations. Psomas and Associates cannot predict whether quarry expansion would significantly alter local habitat use for any of these three large mammals.

RECOMMENDATIONS

Special status plants:

The proposed overburden site would not directly affect listed threatened or endangered species, but a population of Cushenbury oxytheca occurs near the site and should be carefully avoided. The proposed overburden site includes a buffer zone surrounding the Cushenbury oxytheca population. We recommend that PSC delineate and mark the buffer area before beginning to place overburden, and protect the site by placing a barrier of boulders around its perimeter so that loose overburden does not roll onto it during dumping. We also recommend regular monitoring of the Cushenbury oxytheca site to confirm that overburden placement does not cause inundation or other hydrologic impacts to the plant population.

We do not recommend mitigation measures for impacts to other special status plant species, since these impacts would not be significant.

Special status animals:

SBNF direction is to "maintain, improve, and expand mountain sheep habitat, and to provide for aesthetic educational, and recreational uses for mountain sheep," and the LRMP notes human encroachment into sheep habitat as a potential conflict (EIS p. III-85-86). We recommend that PSC and the SBNF continue to regularly document dates and locations of bighorn sheep observed on or near the site to determine their response to mining activity. There is no specific direction for the other special status animal species which may occur on the site. Psomas and Associates recommends that PSC revegetate the proposed quarry and overburden sites to restore habitat and cover for wildlife use in conformance with the Surface Mining and Reclamation Act and SBNF policy.

REFERENCES

- Abrams, L. 1923-1951. Illustrated Pacific States Flora, Vols. 1-3. Stanford University Press, Stanford, Calif.
- Abrams, L. and R. Ferris. 1960. Illustrated Pacific States Flora, Vol. 4. Stanford University Press, Stanford, Calif.
- Barbour, R.W. and W.H. Davis. 1969. Bats of America. University Press of Kentucky, Lexington, Kentucky.
- California Department of Fish and Game, Natural Diversity Data Base (NDDB). 1994. Special animals. Unpublished report available from California Department of Fish and Game, Sacramento.
- California Department of Fish and Game, Natural Diversity Data Base (NDDB). 1996. Special plants. Unpublished report available from California Department of Fish and Game, Sacramento.
- Derby, J. 1978. Memorandum reg. botanical investigation of *Arabis parishii* (preliminary report). On file at San Bernardino National Forest, San Bernardino, Calif.
- Fenton, M.B. 1983. Just Bats. University of Toronto Press, Toronto, Canada.
- Garrett, K. and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Society, Los Angeles, California.
- Hall, E.R. 1981. The Mammals of North America. John Wiley and Sons, New York.
- Heckard, L.R., M.I. Morris, and T.I. Chuang. 1980. Origin and Taxonomy of *Castilleja montigena* (Scrophulariaceae). Systematic Botany 5:71-85.
- Hickman, J.C. (ed.) 1993. The Jepson Manual. University of California Press, Berkeley.
- Ingles, L. G. 1965. Mammals of the Pacific States. Stanford University Press, Stanford, California.
- Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Dept. of Fish and Game, Sacramento.
- Krantz, T. 1978. A botanical investigation of *Arabis parishii* Wats. Unpublished report prepared for San Bernardino National Forest, San Bernardino, Calif., and Pluess-Staufner (California), Inc., Lucerne Valley, Calif.
- Mason, H.L. 1957. A Flora of the Marshes of California. University of California Press, Berkeley.
- Myers, S.J. 1988. Mining company leased holdings in the San Bernardino National Forest: avian surveys during the 1988 breeding season. Unpublished report on file at San Bernardino National Forest Supervisor's Office, San Bernardino, Calif.
- Munz, P.A. 1974. A Flora of Southern California. University of California Press, Berkeley.
- Psomas and Associates. 1996. Federally listed plants on selected Specialty Minerals Lands. Unpublished report prepared for Specialty Minerals, Inc. and submitted to San Bernardino County Planning Dept., San Bernardino, Calif.
- Remsen, J.V. 1978. Bird species of special concern in California. California Department of Fish and Game, Sacramento.
- San Bernardino National Forest. 1995. Sensitive plant species. Unpublished list available from Supervisor's Office, San Bernardino, Calif.

- Sanders, A.C., T. Krantz, and R. Thorne. The Vascular Plants of the San Bernardino Mountains. Unpublished working draft manuscript. Herbarium, University of California, Riverside.
- Skinner, M.W. and B.M. Pavlik. 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. CNPS, Sacramento.
- Stebbins, R.C. 1954. Amphibians and Reptiles of Western North America. McGraw-Hill, New York.
- Stebbins, R.C. 1985. Western Reptiles and Amphibians. Houghton Mifflin Company, Boston Mass.
- US Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants; review of plant taxa for listing as endangered or threatened species. Federal Register 58:51144-51190.
- US Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants; animal candidate review for listing as endangered or threatened species. Federal Register 59:58982-59028.
- US Fish and Wildlife Service. 1995. Endangered and threatened wildlife and plants: proposed endangered or threatened status for seven plants from the mountains of southern California. Federal Register 60(148):39337-39347.
- Williams, D.F. 1976. Mammalian species of special concern in California. California Department of Fish and Game, Sacramento.
- Zeiner, D.C., W. F. Laudenslayer, K.E. Mayer, and M. White. 1988-1990. California's Wildlife, Vol. 1: Amphibians and Reptiles; Vol. II: Birds; Vol. III: Mammals. California Department of Fish and Game, Sacramento.

APPENDIX 1: Special status plants and animals.

Species not addressed further: Latin name	Common name	Reason for exclusion
<i>Astragalus lentiginosus</i> var. <i>antonius</i>	San Antonio milk vetch	No confirmed local records
<i>Berberis fremontii</i>	Fremont's barberry	Only historic local site now presumed extinct
<i>Castilleja cinera</i>	Ash-gray Indian paintbrush	No suitable habitat (pebble plains, alkaline meadows)
<i>Castilleja lasiorhyncha</i> (<i>Orthocarpus lasiorhynchus</i>)	San Bernardino Mountain owl's clover	No suitable habitat (intermittent streams; meadow margins)
<i>Lilium parryi</i>	Lemon lily	No suitable habitat (wet meadows; streams)
<i>Perideridia parishii</i> ssp. <i>parishii</i>	Parish's yampah	No suitable habitat (wet meadows, other moist areas)
<i>Scutellaria bolanderi</i> ssp. <i>austromontanum</i>	Southern mountain skullcap	No local records; no suitable habitat (stream banks, etc.)
<i>Sidalcea pedata</i>	Bird's foot checkerbloom	No suitable habitat (meadows)
<i>Euchloe hyantis</i> ssp. <i>andrewsi</i>	Andrews' marble butterfly	No suitable habitat (chaparral & associated woodlands)
<i>Rana muscosa</i>	Mountain yellow-legged frog	No suitable habitat (perennial surface water)
<i>Charina bottae umbricata</i>	Southern rubber boa	No suitable habitat (mesic mixed evergreen forests)
<i>Aquila chrysaetos</i>	Golden eagle	No nesting habitat; foraging habitat only marginally suitable
<i>Falco mexicanus</i>	Prairie falcon	No nesting habitat
<i>Cathartes aurea</i>	Turkey vulture	No nesting habitat
<i>Perognathus alticolus</i>	White-eared pocket mouse	No local records; all regional records historic

Special Status Amphibian and Reptile Species	Habitat and Distribution ¹	Activity season ¹	Status Designation ²	Occurrence Probability ³
<i>Ensatina escholtzii croceater</i> Yellow-blotched salamander <i>E. escholtzii klauberi</i> Large-blotched salamander	Moist sites in forests, e.g. beneath fallen logs; ssp. <i>croceater</i> occurs in Tehachapi Mtns. and <i>klauberi</i> in Transverse & Peninsular Ranges; intergrades between these spp. occur in SB Mts., and ssp. <i>klauberi</i> hybridizes w/ ssp. <i>eschscholtzii</i> (no special status) in some areas.	Spring	Fed: former C2 USFS watch list Calif: CSC	Low - moderate (project sites probably too arid)

Appendix 1: Special status plants and animals (cont.).

Special Status Amphibian and Reptile Species	Habitat and Distribution ¹	Activity season ¹	Status Designation ²	Occurrence Probability ³
<i>Sceloporus graciosus vanderbergianus</i> Southern sagebrush lizard	Forest, shrubland above about 3000 ft. elev.; Transverse and Peninsular Ranges, S Calif and N Baja Calif	Spring-summer	Fed: former C2 USFS: ND Calif: S?	O ccurs (occas. at all three sites)
<i>Phrynosoma coronatum ssp. blainvillei</i> San Diego horned lizard	Forest, shrubland or grassland with sandy areas; W Calif. from LA Co. S through Baja Calif., below ±6000 ft. elev.	Spring - summer	Fed: former C2 USFS watch list Calif: CSC. S3	Low (above elev. range)
<i>Lampropeltis zonata parvirubra</i> San Bernardino Mountain kingsnake	Forests and shrublands; San Gabriel, San Bernardino and San Jacinto Mts endemic	Spring - summer	Fed: former C2 USFS watch list Calif: CSC S1S2	Moderate

1. Jennings and Hayes 1994, Rarefind 1997, Stebbins 1954, 1985, Zeiner et al. 1988.

2. Calif. Dept. of Fish and Game NDDB 1994, USFWS 1994.

3. Jennings and Hayes 1994, Rarefind 1996.

Special Status Bird Species	Habitat and Distribution ¹	Activity season ¹	Status Designation ²	Occurrence Probability ³
<i>Haliaeetus leucocephalus</i> Bald eagle	Breed in large trees, usually near major rivers or lakes; winters more widely; wide but scattered distribution in N America; esp. coastal regions	Winter	Fed: END USFS: sensitive Calif: S3, END	Nesting: Absent Winter roosting: Low
<i>Accipiter striatus</i> Sharp-shinned hawk	Nests and hunts in forests and woodlands, also forages in open areas; throughout N America, parts of S America	Spring - early summer	Fed: ND USFS: ND Calif: CSC (nesting only)	Nesting: Absent Winter: Expected
<i>Accipiter cooperii</i> Cooper's hawk	Nests and hunts in forests and woodlands occasionally forages in open areas; most of US, Central and S America	Year-around	Fed: ND USFS: ND Calif: CSC (nesting only)	Nesting: Low Foraging: Expected (Infreq.)
<i>Oreotyx pictus</i> Mountain quail	Shrubland, forest, and woodland; foothills and mountains throughout California and western US	Year-around	FWS: C3c USFS: candidate sens. Calif: S?	Expected (suitable habitat throughout)

Appendix 1: Special status plants and animals (cont.).

Special Status Bird Species	Habitat and Distribution ¹	Activity season ¹	Status Designation ²	Occurrence Probability ³
<i>Otus flammeolus</i> Flammulated owl	Pine and oak forests, woodlands; usually nests in old woodpecker cavities; W US and Mexico	Late spring - summer	FWS: ND USFS: watch list Calif: ND	Breeding: Moderate Foraging: High
<i>Strix occidentalis occidentalis</i> California spotted owl	Nests and forages year-around in dense conifer, oak, or (sometimes) riparian forest; Sierra Nevada, cent & S Coast Ranges, S Calif mtns	Year-around	Fed: former C2 Calif: CSC	Nesting: Absent Foraging: Expected (uncomm.)
<i>Melanarpes lewis</i> Lewis' woodpecker	Breeds in hardwood and coniferous forests to N and E, sometimes winters in S Calif. woodlands. Infrequent records in SB Mts. breeding	Winter	Fed: ND USFS: watch list Calif: ND	Expected (uncomm.) in some winters Very low breeding
<i>Caprimulgus vociferus</i> Whip-poor-will	Breeds at scattered sites in S Calif. mts; open, arid oak-conifer habitat; Ariz., N Mexico, Mex., disjunct to E US; winters Mexico & cent. Amer.	Summer	Fed: ND USFS: watch list Calif: ND	Unknown in migration Moderate breeding
<i>Piranga flava</i> Hepatic tanager	Conifer and oak forests; desert mountain ranges of S Calif., Ariz., N. Mexico, Texas, and Mexico	Spring - summer	Fed: ND USFS: watch list Calif: CSC	Unknown (habitat suitable but bird uncommon)
<i>Vireo vicinior</i> Gray vireo	Arid shrublands and pinyon-juniper woodlands; breeds in mountains of SW US, winters in W Mexico	spring - summer	Fed: ND USFS: watch list Calif: CSC	High (recorded nearby in 1988)

1. Garrett & Dunn 1981, Grinnell & Miller 1944, Ingles 1929, National Geographic Society 1987, Rarefind 1996, Remsen 1978, Zeiner et al. 1990.

2. CDF&G NDDB 1992, USFWS 1994.

3. Rarefind 1996; field surveys reported here.

Special Status Mammals	Habitat and Distribution ¹	Activity season ¹	Status Designation ²	Occurrence Probability ³
<i>Glaucomys sabrinus californicus</i> San Bernardino Mountain flying squirrel	In San Bernardino Mts, occur in mixed conifer forest (white fir, black oak) above ±5200 ft. elev.; SB and San Jacinto Mts (expected in San Gabriels)	Year-around (nocturnal)	Fed: Former C2 USFS sensitive Calif: ND	Low (habitat marginally suitable)

Appendix 1: Special status plants and animals (cont.).

Special Status Mammals	Habitat and Distribution ¹	Activity season ¹	Status Designation ²	Occurrence Probability ³
<i>Antrozous pallidus</i> Pallid bat	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif (exc high mts), SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	FWS: ND USFS: ND Calif: CSC, S?	Roosting: Low (elev.) Foraging: Low
<i>Eumops perotis californicus</i> California mastiff bat	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: former C2 USFS: ND Calif: CSC, S?	Roosting: Absent (elev.) Foraging: Unknown
<i>Myotis lucifugus occultus</i> Occult little brown bat (syn. <i>M. occultus</i> , Arizona brown bat)	Gen. pine forests, 6000-9000 ft. elev. (also lower elev. riparian habitat); roosts in buildings, trees, rocks, etc.; feeds over water or open sites; hibernates in winter; SE Calif through Arizona and New Mexico	warm season	Fed: former C2 USFS: sensitive Calif: CSC	Roosting: Moderate Foraging: Low
<i>Euderma maculatum</i> Spotted bat	Desert (cool seasons) to pine forest (summer), much of SW N. Amer., but very rare; roosts in deep crevices in cliffs, feeds on moths captured over open water	Unknown	Fed: Former C2 USFS: sensitive Calif: CSC	Roosting: Low Foraging: Low
<i>Plecotus townsendii pallescens</i> (<i>Corynorhinus t. pallescens</i>) Townsend's big-eared bat	Many habitats throughout Calif and W N Amer, scattered pop'ns in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: former C2 USFS: ND Calif: CSC, S3	Roosting: Absent Foraging: Unknown
<i>Taxidea taxus</i> American badger	Mountains, deserts, interior valleys where burrowing animals are avail as prey and soil permits digging; throughout cent and W N Amer	Year-around	Fed: ND USFS: MES Calif: CSC	Occurs (sign at proposed NW expansion site)
<i>Felis concolor</i> Mountain lion	Large natural areas where prey (primarily deer) is available; throughout W N Amer	Year-around	Fed: ND USFS: MES Calif: CP	Expected
<i>Odocoileus hemionus californicus</i> California mule deer	Forests and shrublands, mountains large open space areas, Sierra Nevada south through Transverse Ranges, San Jacinto Mts.	Year-around	Fed: ND USFS: Mgt. Emphasis Calif: ND	Occurs (sign in proposed overburden area)
<i>Ovis canadensis nelsoni</i> Nelson's bighorn sheep	Open shrublands and conifer forest, remote mountains; scattered pop'ns in Transverse Ranges, Mojave Des. Ranges, White Mts.	Year-around	Fed: ND USFS: MES Calif: *	Occurs (sign common; often observed in area)

1. Barbour & Davis 1969 (bats); Hall 1981; Ingles 1965; Rarefind 1997; Williams 1976; Zeiner 1990.
2. CDF&G Natural Diversity Data Base 1994; US Fish and Wildlife Service 1994.
3. Rarefind 1997; field surveys reported here.

Appendix 1: Special status plants and animals (cont.).

Sensitive Plant Species	Habitat and Distribution ¹	Flower season ¹	Status Designation ²	Occurrence Probability ³
<i>Abronia nana</i> ssp. <i>covillei</i> Coville's dwarf abronia	Carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, ±5200-9200 ft.	May - August	Fed: ND USFS: ND Calif: S2S3.2 CNPS: List 4 R-E-D:1-2-1	Absent
<i>Arabis parishii</i> Parish's rock cress	Pebble plains; open dry sites in coniferous forest; ±6300-9500 ft. elev.; San Bernardino Mts. endemic	April - May	Fed: former C2; USFS Sensitive Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	Occurs (scarce at SW expansion area; absent elsewhere)
<i>Astragalus albens</i> Cushenbury milk vetch	Carbonate outcrops and alluvial / colluvial deposits to about 6000 ft. elev.; San Bernardino Mts endemic	March - May	Fed: END USFS Sensitive Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	Absent
<i>Astragalus bicristatus</i> Crested milk vetch	Rocky slopes, montane coniferous forests; 5500-8200 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mts	May - August	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-3	Absent
<i>Astragalus lentiginosus</i> var. <i>sierrae</i> Big Bear Valley milk vetch	Rocky meadows, pine woodlands, 5800-8500 ft. elev.; San Bernardino Mts. endemic	April - August	Fed: former C2 USFS watch list Calif: S1? CNPS: List 1B R-E-D:2-2-3	Absent
<i>Astragalus leucolobus</i> Bear Valley woollypod	Rocky soils, pine forests and sagebrush scrub, 5600-8000 ft. elev.; San Bernardino, San Gabriel, San Jacinto, and Sta Rosa Mts.	May - July	Fed: former C2 USFS watch list Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	Absent
<i>Castilleja applegatei</i> ssp. <i>martinii</i> × <i>C. angustifolia</i> (syn. <i>C. montigena</i> , <i>C. martinii</i> var. <i>ewanii</i>) Heckard's paintbrush	Coniferous forest; San Bernardino Mountains endemic [Note: described as a species by Heckard <i>et al.</i> (1980) but mentioned only briefly as a hybrid by Chuang & Heckard in Hickman (ed., 1993)]	March - July	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-3	Occurs (uncomm. to occasional at all three sites)
<i>Castilleja lasiorhyncha</i> (<i>Orthocarpus lasiorhynchus</i>) San Bernardino Mountain owl's clover	Meadows, streamsides, seeps, other mesic sites, ±4200-7500 ft. elev.; S Calif. mtns.	June - July	Fed: former C2 USFS Sensitive Calif: S2.2 CNPS: List 1B R-E-D:1-2-3	Absent

Appendix 1: Special status plants and animals (cont.).

Sensitive Plant Species	Habitat and Distribution ¹	Flower season ¹	Status Designation ²	Occurrence Probability ³
<i>Dryopteris filix-mas</i> Male fern	Widespread in n hemisphere, esp. at high latitudes; only two widely separated locations in Calif., incl. one in Holcomb Valley	July - Sept.	Fed: ND USFS: ND Calif: S1.2 CNPS: List 2 R-E-D:3-1-1	Absent
<i>Dudleya abramsii</i> ssp. <i>affinis</i> San Bernardino Mts. <i>dudleya</i>	Pebble plains & rocky outcrops (often on carbonate); pinyon woodland, open pine forests, 5800-8500 ft. elev.; San Bernardino Mts. endemic	April - June	Fed: former C2 USFS watch list Calif: S1/S2 CNPS: List 1B R-E-D:2-2-3	Absent
<i>Erigeron parishii</i> Parish's daisy	Carbonate soils to 6400 feet elev., San Bernardino Mountains endemic	May - June	Fed: THR USFS Sensitive Calif: 2.1 CNPS: 1B R-E-D:2-3-3	Absent
<i>Eriogonum foliosum</i> Leafy buckwheat	Sand; chaparral, lower montane coniferous forest, pinyon wlld., 3900-7200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.	July - Oct.	Fed: ND USFS watch list Calif: S2? CNPS: 1B R-E-D:2-2-2	Absent
<i>Eriogonum microthecum</i> var. <i>corymbosoides</i> San Bernardino Mountain buckwheat	Carbonate soils, pinyon-juniper woodlands; about 5800-9500 ft. elev.; San Bernardino Mts. endemic (Skinner & Pavlik erroneously state "granitic")	July - Sept.	Fed: ND USFS: ND Calif: S2? CNPS: List 4 R-E-D:1-1-3	Occurs (comm. at both proposed expansion areas)
<i>Eriogonum ovalifolium</i> var. <i>vineum</i> Cushenbury buckwheat	Carbonate soils, outcrops, and talus; about 3900 to 7000 ft. elev.; San Bernardino Mountains endemic	May - June	Fed: END USFS Sensitive Calif: 1.1 CNPS: List 1B R-E-D:3-3-3	Absent
<i>Eriophyllum lanatum</i> var. <i>obovatum</i> Southern Sierra woolly sunflower	Open montane coniferous forests, 4200-8100 ft. elev.; S Sierra Nevada and San Bernardino Mts.	June - July	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-3	Absent
<i>Galium jepsonii</i> (syn. <i>G. angustifolium</i> var. <i>subglabrum</i>) Jepson's bedstraw	Sandy or gravelly soils, montane coniferous forest, 6500-8100 ft. elev.; San Gabriel and San Bernardino Mts	July - August	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-3	Absent

Appendix 1: Special status plants and animals (cont.).

Sensitive Plant Species	Habitat and Distribution ¹	Flower season ¹	Status Designation ²	Occurrence Probability ³
<i>Galium johnstonii</i> (syn. <i>G. angustifolium</i> var. <i>pinetorum</i>) Johnston's bedstraw	Dry rocky slopes, open mixed conifer forest, 5300-7500 ft. elev.; San Gabriel and San Bernardino Mts.	June - July	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-3	Absent
<i>Heuchera parishii</i> Parish's alumroot	Rocky places, montane coniferous forests and alpine boulderfields, above 4800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: ND USFS: watch list Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	Absent
<i>Hulsea vestita</i> ssp. <i>parryi</i> Parry's sunflower	Rocky sites in conifer forests, usually loose eroding soil and talus; San Bernardino Mts and Little San Bernardino Mts; ±5500-9500 ft. elev.	April - August	Fed: ND USFS: ND Calif: S3? CNPS: List 4 R-E-D:1-1-3	Absent
<i>Ivesia argyrocoma</i> Silver-haired ivesia	Pebble plains, dry or seasonally moist meadows and drainages; ±5000-7500 ft. elev.; San Bernardino Mts and a long-disjunct site in Baja Calif mts	June - August	Fed: former C2 USFS: watch list Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	Absent
<i>Lesquerella kingii</i> var. <i>bernardina</i> San Bernardino Mtns. bladderpod	Carbonate soils above about 6800 ft. elev.; San Bernardino Mts. endemic	May - June	Fed: END USFS: Sensitive Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	Absent
<i>Lupinus excubitus</i> var. <i>johnstonii</i> Interior bush lupine	San Gabriel and San Bernardino Mts (reported in Hickman 1993 but not other sources), about 4900 to 8200 ft. elev.	May - July	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-3	Absent
<i>Oxytheca parishii</i> var. <i>goodmaniana</i> Cushenbury oxytheca	Carbonate soils, about 4200 to 7700 ft. elev.; San Bernardino Mts. endemic; populations fluctuate widely year to year	May - Sept.	Fed: END USFS: Sensitive Calif: S? CNPS: List 1B R-E-D:3-3-3	Occurs adjacent to proposed overburden site
<i>Oxytheca varyophylloides</i> Chickweed oxytheca	Sandy soils in conifer forests, 3900-8500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mts.	July - Sept.	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-3	Absent

Appendix 1: Special status plants and animals (cont.).

Sensitive Plant Species	Habitat and Distribution ¹	Flower season ¹	Status Designation ²	Occurrence Probability ³
<i>Phacelia exilis</i> (syn. <i>P. mohavensis</i> var. <i>exilis</i>) Transverse Range phacelia	Sandy or gravelly soils, forest openings, meadows, pebble plains, 3500-8800 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: ND USFS: ND Calif: S2? CNPS: List 4 R-E-D:1-1-3	Occurs (scarce on overburden site)
<i>Phacelia mohavensis</i> ssp. <i>mohavensis</i> Mojave phacelia	Sandy or gravelly soils, woodlands, conifer forests, dry meadows and streambeds, 4500-8100 ft. elev.; San Gabriel & San Bernardino Mts	April - August	Fed: ND USFS: ND Calif: S3? CNPS: List 4 R-E-D:1-1-3	Absent
<i>Phlox dolichantha</i> Bear Valley phlox	Montane coniferous forest; 6500-8800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: former C2 USFS sensitive Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	Absent
<i>Polystichum kruckebergii</i> Krukeberg's sword fern	Rocky places, montane coniferous forest, 6800-10,400 ft. elev.; Calif. mts to British Columbia, Montana, Utah (occurrence in San Bernardino Mts uncertain)	June - August	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-1-1	Absent
<i>Rupertia rigida</i> (syn. <i>Psoralea rigida</i>) Parish's rupertia	Chaparral, forests, and woodlands, below ±8100 ft. elev.; San Bernardino Mts, Peninsular Ranges, Baja Calif.	June - July	Fed: ND USFS: ND Calif: S2? CNPS: List 4 R-E-D:1-1-2	Absent
<i>Sedum niveum</i> Davidson's stonecrop	Rocky ledges and crevices, upper montane coniferous forest, 7100-9800 ft. elev.; San Bernardino Mts, Santa Rosa Mts	June - July	Fed: ND USFS: ND Calif: S? CNPS: List 4 R-E-D:1-2-2	Absent
<i>Selaginella asprella</i> Bluish spike-moss	Rocks, crevices, & rocky soils, dry sites in coniferous forests, 5200-8800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: ND USFS: ND Calif: S3/S4 CNPS: List 4 R-E-D:1-1-2	Absent
<i>Senecio ionophyllus</i> Tehachapi ragwort	Crevices, rocky places in dry coniferous forest, 4800-8900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mts	June - July	Fed: ND USFS: ND Calif: S3? CNPS: List 4 R-E-D:1-1-3	Absent

Appendix 1: Special status plants and animals (cont.).

Sensitive Plant Species	Habitat and Distribution ¹	Flower season ¹	Status Designation ²	Occurrence Probability ³
<i>Streptanthus campestris</i> Southern jewelflower	Rocky sites, chaparral, coniferous forest, pinyon woodland, 2900-7500 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: ND USFS watch list Calif: S2? CNPS: List 1B R-E-D:2-1-2	Absent
<i>Swertia neglecta</i> (syn. <i>Frasera neglecta</i>) Pine green-gentian	Coniferous forests and pinyon woodland., 4500-8100 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: ND USFS: ND Calif: S2S3 CNPS: List 4 R-E-D: 1-1-3	Occurs (occas. at proposed overburden area
<i>Viola pinetorum</i> ssp. <i>grisea</i> Grey-leaved violet	Montane coniferous forests, 4800-11,100 ft. elev.; S Sierra Nevada Mts and possibly San Bernardinos [note: Skinner & Pavlik include SB Mtn locations but Hickman (ed.) does not]	April	Fed: ND USFS: ND Calif: S1? CNPS: List 1B R-E-D:3-1-3	Absent

1. Hickman (ed.) 1993; Munz 1974; Sanders et. al. 1995; Skinner and Pavlik 1994.

2. Calif. Dept. of Fish and Game 1996; Skinner and Pavlik 1994; San Bernardino National Forest 1995; US Fish and Wildlife Service 1993.

3. Occurrences based on field survey and reference to Rarefind 1997; Sanders et. al. 1995.

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service):

END: Federally listed, endangered.

THR: Federally listed, threatened.

C1: Category 1 candidate. Sufficient data are available to support federal listing, but not listed at this time.

C1*: Category 1 candidate species, but presumed extinct.

former C2: Formerly a category 2 candidate species. Threat and/or distribution data are not sufficient to support federal listing at this time. (FWS no longer recognizes category 2 species).

C3a: Extinct.

C3b: Taxonomically invalid.

C3c: Too widespread and/or not threatened. No longer considered as a federal candidate for listing.

MES: USFS Management Emphasis Species

ND: Not designated.

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

END: State listed, endangered.

CCE: Candidate for state listing as endangered.

THR: State listed, threatened.

RARE: State listed as rare (Listed "Rare" animals have been re-designated as Threatened, but Rare plants have retained the Rare designation.)

CSC: California Species of Special Concern.

CP: Fully protected under California Fish and Game Code, Sections 3511, 4700, 5050, 5515.

W: Watch list.

SA: California "special animal." Meets any one of several Department of Fish and Game criteria, but no specific reason is given for the designation.

ND: Not designated.

Appendix 1: Special status plants and animals (cont.).

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.

California Native Plant Society (CNPS) designations: (Note: According to CNPS (Smith and Berg 1988), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10 of the California Fish and Game Code.)

List 1A: Plants presumed extinct in California.

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

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

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

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

CNPS R-E-D Code:

Rarity 1: Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.

2: Occurrence confined to several populations or one extended population.

3: Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

Endangerment 1: Not endangered.

2: Endangered in a portion of its range.

3: Endangered throughout its range.

Distribution 1: More or less widespread outside California.

2: Rare outside California.

3: Endemic to California (i.e., does not occur outside California).

Definitions of occurrence probability:

Occurs: Observed on the site during surveys described here, or recorded on-site by other qualified biologists.

High: Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species and the site is within the known range of the species.

Moderate: Reported sightings in surrounding region, or site is within the known range of the species and habitat on the site is a type occasionally used by the species.

Low: Site is within the known range of the species but habitat on the site is rarely used by the species.

Absent: A focused study failed to detect the species, or, no suitable habitat is present.

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

Appendix 2: Species list.

This list reports only the species observed on the site during this study. Other species may have been overlooked due to their growing season. Plants were identified from keys, descriptions, and drawings in Abrams (1923, 1944, 1951); Abrams and Ferris (1960); Hickman (1993); Mason (1957); Munz (1974), and Sanders et al. (1995). Some specimens were identified or confirmed by A.C. Sanders (U.C. Riverside). Nomenclature and systematics follow Hickman (1993). Identifications supported by voucher specimens are identified by collection number (S. White); the specimens have been donated to the U.C. Riverside Herbarium.

Latin name	Common name	Note	Turn 16	S. Quarry	Overburden	Voucher
CONIFERALES						
CUPRESSACEAE	CYPRESS FAMILY					
<i>Juniperus occidentalis</i>	Western juniper		Comm.	Comm.	Comm.	5276
PINACEAE	PINE FAMILY					
<i>Abies concolor</i>	White fir			Uncom.	Occas.-comm.	
<i>Pinus jeffreyi</i>	Jeffrey pine			Comm.	Comm.	
<i>Pinus monophylla</i>	Single-needle piñon		Comm.	Comm.	Comm.	
EPHEDRALES						
EPHEDRACEAE	EPHEDRA FAMILY					
<i>Ephedra viridis</i> (?)	Green ephedra		Scarce			
DICOTYLEDONES						
ASTERACEAE	ASTER FAMILY					
<i>Agoseris</i> sp.	Unid. wild dandelion			Uncomm.	Scarce	
<i>Artemisia dracunculoides</i>	Tarragon			Comm.	Uncomm.	
<i>Artemisia tridentata</i>	Great Basin sagebrush			Uncomm.	Comm.	5274
<i>Chrysothamnus nauseosus</i>	Common rabbitbrush			Uncomm.	Occas.	
<i>Chrysothamnus paryi</i>	Rare rabbitbrush		Comm.	Comm.	Comm.	5296
<i>Chrysothamnus viscidiflorus</i> ssp. <i>viscidiflorus</i>	Yellow rabbitbrush		Comm.	Comm.	Comm.	
<i>Ericameria linearifolia</i>	Goldenbush			Uncomm.	Scarce	
<i>Gutierrezia microcephala</i>	Small-flowered matchweed			Uncomm.	Occas.	5285
BORAGINACEAE	BORAGE FAMILY					
<i>Cryptantha</i> sp.	Unid. annual cryptantha				uncomm.	5272
BRASSICACEAE	MUSTARD FAMILY					
<i>Arabis</i> sp.	Unid. rock-cress			Uncomm.	Uncomm.	5301
<i>Arabis holboellii</i>	Holboell rock-cress			Uncomm.	Uncomm.	5302, 5304
<i>Arabis parishii</i>	Parish rock cress	2	Scarce		Uncomm.	
<i>Arabis perennans</i> (?)	Rock-cress				Uncomm.	5300, 5303

Appendix 2: Species list.

BRASSICACEAE, cont.				
Caulanthus major	Grand jewelflower	Occas.		
Descurainia pinnata	Tansy mustard	Occas.		5292
Erysimum capitatum	Western wallflower	Occas.		
Sisymbrium altissimum	Tumble-mustard	Uncomm.	1	
CACTACEAE	CACTUS FAMILY			
Opuntia basilaris var. basilaris	Beavertail cactus	Occas.		
CARYOPHYLLACEAE	CARNATION FAMILY			
Arenaria macradenia (?)	Desert sandwort	Occas.		5294
Silene verucunda	Campion	Occas.		5297
CHENOPODIACEAE	GOOSEFOOT FAMILY			
Salsola tragus	Russian thistle	Roadside	1	
ERICACEAE	HEATH FAMILY			
Arctostaphylos glauca	Bigberry manzanita	Scarce		
Arctostaphylos patula	Greenleaf manzanita	Occas.		
EUPHORBIACEAE	SPURGE FAMILY			
Chamaesyce albomarginata	Rattlesnake weed	Scarce		5287
FABACEAE	LEGUME FAMILY			
Astragalus douglasii	Douglas rattleweed	Occas.		
Lupinus excubitus (?)	Bush lupine	Occas.		
FAGACEAE	OAK FAMILY			
Quercus chrysolepis	Canyon live oak	Occas.		
GENTIANACEAE	GENTIAN FAMILY			
Sweetia neglecta	Pine green gentian	Uncomm.-occas.	2	5277
GROSSULARIACEAE	CURRANT FAMILY			
Ribes cereum	Wax current	Occas.		5275
HYDROPHYLLACEAE	HELIOTROPE FAMILY			
Eriodictyon trichocalyx	Yerba santa	Occas.		5286
Nama rothrockii	Purple mat	Uncomm.		5271
Phacelia exilis	Transverse Range phacelia			
(P. mohavensis ssp. exilis)				
Phacelia hastata (?)	Arrowleaf phacelia			5270
LAMIACEAE	MINT FAMILY			
Salvia pachyphylla	Thick-leaf sage	Comm.		
LOASACEAE	STICK-LEAF FAMILY			
Mentzelia laevicaulis	Giant blazing star	Roadside		
PAPAVERACEAE	POPPY FAMILY			
Argemone munita	Chicalote, prickly poppy	Uncomm.		

Appendix 2: Species list.

POLEMONIACEAE	PHLOX FAMILY				
Gilia sp.	Unid. annual gilia			Uncomm.	5279
Phlox austromontana	Southern mountain phlox	Comm.		Comm.	5298
POLYGONACEAE	BUCKWHEAT FAMILY				
Eriogonum microthecum	San Bernardino buckwheat	2	Comm.	Occas.-comm.	5293
var. corymbosoides					
Eriogonum nidularium	Nidulate buckwheat			Uncomm.	5280
Eriogonum parishii	Parish buckwheat			Uncomm.	
Eriogonum umbellatum	Alpine buckwheat		Occas.		5289
var. minus					
Eriogonum wrightii	Matted Wright's buckwheat			Occas.	
var. subscaposum					
Oxytheca parishii	Cushenbury oxytheca	2		See text	
var. goodmaniana					
RANUNCULACEAE	BUTTERCUP FAMILY				
Delphinium parishii	Desert larkspur			Scarce	5269
RHAMNACEAE	BUCKTHORN FAMILY				
Ceanothus greggii	Cupleaf ceanothus			Uncomm.	5284
ROSACEAE	ROSE FAMILY				
Amelanchier utahensis	Serviceberry			Occas.	
Cercocarpus ledifolius	Curly-leaf mountain mahogany		Comm.	Occas.	
SCROPHULARIACEAE	FIGWORT FAMILY				
Castilleja montigena	Heckard's paintbrush	2	Occas.	Uncomm.	5299
(C. applegatei x C. angustifolia)					
Cordylanthus nevini	Nevin's bird beak			Occas.	
Pedicularis semibarbata	Lousewort		Occas.	Occas.	5290
Penstemon eatonii (?)	Eaton's penstemon			Uncomm.-occas.	
Penstemon grinnellii	Grinnell's penstemon		Occas.	Occas.	
SOLANACEAE	NIGHTSHADE FAMILY				
Nicotiana sp.	Unid. wild tobacco			Uncomm.	
Solanum xanti var. montanum	Mountain nightshade			Occas.	5273
STERCULIACEAE	CACAO FAMILY				
Fremontodendron californicum	Fremontia		Occas.	Occas.	5283
VISACEAE	MISTLETOE FAMILY				
Phoradendron juniperinum	Juniper mistletoe			Occas.	5278

Appendix 2: Species list.

MONOCOTYLEDONES

POACEAE

Achnatherum hymenoides
 Achnatherum parishii
 Bromus tectorum
 Elymus elymoides
 Melica stricta
 Poa fendleriana

GRASS FAMILY

Indian ricegrass
 Parish's needlegrass
 Cheatgrass
 Bottlebrush squirreltail
 Spike melic
 Fendler bluegrass

Occas.
 Uncomm.
 Uncomm.
 Occas.
 Comm.

1

Occas.
 Uncomm.
 Comm.
 Occas.
 Occas.
 Comm.

Occas.
 Uncomm.
 Comm.
 Occas.
 Comm.

5295

5298