

Special Status Vascular Plant List for Yosemite National Park

Final Report



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National Park Service

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
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Introduction

The Inventory and Monitoring Program (I&M) of the National Park Service (NPS) identified vertebrates and vascular plants as the initial priority during the program's biological inventory phase. At the beginning of this five-year phase, Sierra Nevada Network staff evaluated existing information on the presence of vertebrates and vascular plants expected in the parks and existing information on species of special management concern. Due to a paucity of information for Devil's Postpile National Monument, plant surveys were conducted to document the park flora, exotic plant occurrence and special status plants. In contrast, network staff determined, following I&M guidelines, that sufficient information existed to document occurrence of the majority (90%) of vascular plant taxa expected to occur in Sequoia, Kings Canyon and Yosemite national parks, and inventory funds were earmarked for special status plant surveys in these three parks.

The following objectives were established for the special status plant project: 1) develop a list of special status plant taxa both known and expected to occur within the Sierra Nevada Network parks, 2) develop habitat-based models of the predicted distribution of high priority species, 3) develop a sampling strategy for completing surveys for special status plant species, and 4) conduct surveys within the Sierra Nevada Network parks to document the distribution and abundance of high priority taxa.

A contract to develop new, complete lists of the special status plant species of Sequoia, Kings Canyon and Yosemite national parks and Devils Postpile National Monument was awarded to the consulting firm of Jones and Stokes (Sacramento, CA) in September of 2000. In addition to developing a list of taxa both known and expected to occur within the Sierra Nevada Network parks, investigators were charged with completing objectives two and three above. It was upon completion of this work, that surveys were to be conducted within the Sierra Nevada Network parks to document the distribution and abundance of high priority special status plant taxa and to validate the predictive models.

A draft special status plant species list for Yosemite was delivered to the park in November 2001 (MS Access format). The list consisted of 136 taxa, 88 with some record of occurrence in the park, 48 with some expectation of occurrence because the park is within the species' range (e.g., documented from adjacent jurisdictions). The park subsequently entered into a cooperative agreement with the U.S.G.S. Western Ecological Research Center to finalize a special status plant species list for Yosemite and to conduct field surveys for the highest priority taxa for which sufficient information is available to derive predicted habitat models. This report documents the process by which the first project objective was completed for Yosemite and the justifications for establishing the priority order of surveys.

Background

Fairly broad scale surveys for special status plant species were last conducted in Yosemite in the mid-1980s by NPS Resources Management staff. These surveys were done without project funding and were largely limited to the most accessible areas of the park (S. Botti personal comm.). They resulted in field reports that provided some of the following for some taxa: locations, site and population descriptions, associated species lists and photographs or line drawings.

Based on that work, a list of 108 special status vascular plant taxa was retained and referenced by the park. Among the taxa listed, five were federal species of concern (an unofficial designation tracked by the Sacramento office of U.S. Fish and Wildlife Service; these were formerly federal Category 2 taxa), four were listed under the California Endangered Species Act of 1984 as "Rare," 37 were listed by the California Native Plant Society, and 99 were listed by the park as rare due to endemism or limited distribution within the park.

A lack of recent information on the status of special status species in Yosemite prompted the network to solicit a revised list and arrange for survey data to be collected. In addition, National Park Service policy specifies listing and regular monitoring of special status species. National Park Service *Management Policies* (USDI, NPS 1988), in particular, prescribes management of endangered, threatened, and

candidate species in conformance with the Endangered Species Act, recovery plans, and other related documents. It states:

“The National Park Service will identify and promote the conservation of all federally listed threatened, endangered, or candidate species within park boundaries and their critical habitats....The National Park Service also will identify all state and locally listed threatened, endangered, rare, declining, sensitive, or candidate species that are native to and present in the parks, and their critical habitats....”

The NPS guideline series provides more detailed direction to NPS employees to implement policy consistently across the park system. NPS-77 Natural Resource Management Guideline (USDI, NPS 1991) presents the following definitions:

“Candidate species. Those species under consideration for addition to the List of Endangered and Threatened Wildlife identified in Category 1... in the animal or plant notice of review. [Candidate taxa are those] for which the USFWS has substantial information to support the biological appropriateness of proposing to list as endangered or threatened.”

“Rare species. Any species which is considered restricted and limited throughout all or a significant portion of its range. This designation does not necessarily imply that populations of the species are significantly reduced or threatened with reduction. No legally required federal protection is associated with this designation.”

“Sensitive species . Any species or infraspecies not otherwise designated whose population characteristics warrant special management or more intensive monitoring. Considerations may include:

- local rarity of native species
- whether or not the species is endemic to the park or local vicinity
- the importance of the species to the park (as identified in park management objectives)
- whether the species is the subject of political concern or unusual public interest
- the usefulness of the species as an indicator species
- the vulnerability of the species to local population declines
- whether the species or its habitat is subject to human disturbance during critical portions of its life cycle”

It goes on to specify that

“management of [Candidate Species and State Endangered and Threatened Species] should, to the greatest extent possible, parallel the management of federally listed species.... These species should be listed within a project statement of the resource management plan, and a scheduled periodic monitoring effort should be identified.”

In addressing Rare and/or Sensitive species, it indicates that

“management of these species should be determined at the park level in consultation with concerned and knowledgeable parties.”

The creation of a special status plant species list for Yosemite that includes federal, state and locally listed taxa occurring in a park abides by these policies as does the inclusion of plant taxa that meet “sensitive species” criteria. Surveys taking place as part of this project represent the current monitoring effort.

Species List Development

The USGS Ecologist worked together with the NPS-Yosemite Botanist to review, modify, append and supplement the draft list submitted by Jones & Stokes in order to produce a 2003 special status plant species list for Yosemite National Park (YNP). We researched discrepancies between the previous special status plant list and the new proposed list. We established criteria for accepting newly proposed taxa and established a standard set of criteria or rationales for including taxa on the Yosemite list. We corrected the status of various species by consulting various source materials to verify species occurrence in the park and to reference rarity and listing status. We uncovered additional California Native Plant Society listed taxa that occur in the park. Below are summary descriptions of the most relevant sources of occurrence information. The sections that follow then detail and document the review and development process, information sources and resulting database.

Sources of Information

Occurrence information

The following are sources of species occurrence information that informed the development of a new special status plant species list.

1998-1999 Vegetation Mapping Plot Data. Data from over 600 vegetation plots were collected in and around Yosemite in 1998 and 1999 to classify vegetation in connection with development of a new vegetation map. Crews identified all vascular plants present on plots to species. With only 256 of the plots located inside the park boundary, use of the data set to document species occurrence must be limited to that subset.

Botti 1992. S. J. Botti provided Yosemite with a proposed system for rating rarity of plant species. Rarity codes included categories of rarity, population trend, distribution and impact. He included a species list with assigned rarity codes. The park did not adopt the system, but information from the unpublished report has been used to inform management.

Botti 2001. In 2001, Yosemite Association published *An Illustrated Flora of Yosemite National Park*, representing 20 years of work by S. J. Botti to document species occurrence in YNP. Herbarium holdings, personal collections and extensive field surveys formed the basis for the manual's contents. Beyond which taxa can be found in YNP, Botti included notes on commonness, rarity and specific locations.

Botti 2002. S. J. Botti provided an unpublished list of taxa found through his research to have type localities in YNP.

Johnson 2003. To obtain specific documentation of plant species occurrence in YNP, the Sierra Nevada Network funded a project that assembled into a database specific collection information from herbarium holdings in the park and at large regional herbaria. The park now has readily-available information on plant identification, collector, date, and collection location for 9,631 specimens from Yosemite representing 1,560 taxa.

Taylor 2002. D. W. Taylor did surveys in 2002 for special status plant species along three rights-of-way for utility distribution lines in Yosemite under contract with Pacific Gas and Electric Company. His list of target taxa is titled "Comprehensive list of special status plants for Yosemite National Park." In it, he includes indications of documented occurrence in Yosemite as well as occurrence in the rights-of-way.

Listing Status

We verified the listing status of plant taxa occurring in and around Yosemite using 1) a list solicited from the Sacramento Office of the U.S. Fish and Wildlife Service for Yosemite National Park, dated April 10,

2003 and titled "Species List for Special Status Plant Species Habitat Modeling, Yosemite National Park, California" (USFWS 2003) and USFWS online resources (USFWS 2003a, b) 2) State and Federally Listed Endangered, Threatened, and Rare Plants of California (Calif. Dept. Fish and Game 2003), 3) California Native Plant Society's *Inventary of Rare and Endangered Plants of California* (CNPS 2001) and 4) Forest Service sensitive plant lists and watch lists from forests adjoining Yosemite.

Review of the Jones & Stokes Draft List

Our review of the list submitted by Jones & Stokes consisted of two parts: 1) review of taxa previously included on the Yosemite Special Status Plant List but not included on the Jones & Stokes list and 2) review of taxa proposed by Jones & Stokes for park listing that were not previously included on the Yosemite Special Status Plant List. For the former, we assembled information on rarity, distribution, occurrence evidence from Botti (2001), Hickman (1993), CalFlora.org (accessed Nov and Dec 2002), Taylor (2002), Resources Management files, a voucher-based flora database (Johnson 2003), a type locality list from Steve Botti (March 2002). Following review of rarity, distribution, threat, available habitat, and type specimen status, we made a decision, jointly with the NPS Vegetation Program Manager, for each of 32 taxa whether to reinstate them to the revised park list. One species (*Holodiscus discolor*) was not reinstated for reason of commonness; its previous listing had been influenced by some confusion about taxonomic relationships in the central Sierra Nevada. Another species (*Mimulus angustatus*) was added to the "Expected" list due to lack of voucher evidence of park occurrence but very limited distribution in the park should it occur there. The remainder were reinstated to the park list as "Park Sensitive." The list of these 32 taxa is archived on the park network as "SensitivePlants Not on JS List-reviewed Dec 2002.xls."

In reviewing taxa proposed for park listing by Jones & Stokes that were not previously included on the Yosemite Special Status Plant List, we compiled information on rarity, distribution, voucher evidence from the same sources. Based on evidence of rarity, distribution, threat and available habitat, we made a decision, jointly with the NPS Vegetation Program Manager, for each of 30 newly proposed taxa whether to accept them onto the revised park list. Five taxa (*Cirsium canovirens*, *Cryptantha watsonii*, *Erigeron aequifolius*, *Populus angustifolia*, *Puccinellia lemmonii*) were rejected due to erroneous reporting of occurrence in the park (the 1998-1999 vegetation plots from which they were reported were actually located outside the park). Another four taxa were not considered for immediate addition because reported occurrences in 1998-1999 plot data (without specimen collections) are suspect (outside species range, etc.) (*Achnatherum webberi*, *Aster campestris*, *Hackelia floribunda*) or not recognized in Hickman (1993) (*Isoetes bolanderi* var. *pygmaea*).

We accepted onto the revised Yosemite special status plant list those taxa

- actually occurring in the park based on evidence (Johnson 2003, Botti 2001) AND
- included on Jones & Stokes proposed list with the cited source material being something other than inclusion in Botti (1992), Yosemite Valley Plan (2000) (subset of rare plant list for Yosemite National Park - YNP) or Cal Flora (2002) OR
- actually occurring in the park and known to be of limited distribution or at the limit of their natural range.

We reviewed separately each of the taxa included in Botti (1992) and the Yosemite Valley Plan (NPS 2000) and made decisions on their inclusion in the revised list in light of Botti's (1992) rationales, CalFlora (2002) distributions and Hickman (1993). Designated status that formed the basis for acceptance on the revised park list included state or federal listing, listing by the California Native Plant Society (CNPS), inclusion on Forest Service Sensitive Plant Lists or Watch Lists from adjacent National Forests, and listing by California Natural Diversity Database (CNDDB). In addition, a number of other taxa were included with the designation of Park Sensitive (PS) for reasons of local rarity.

Modifications to list based on occurrence evidence. In light of recently acquired data on herbarium holdings from Yosemite, we modified entries regarding occurrence (OCCUR field) from "Expected" to

“Actual” for taxa listed as expected by Jones & Stokes but for which we found voucher records from regional herbaria (Johnson 2003). A total of 15 taxa were changed from expected to actual occurrence:

Astragalus kentrophyta var. *danaus*
Bolandra californica
Camissonia sierrae ssp. *sierrae*
Carex congdonii
Carex scirpoidea var. *pseudoscirpoidea*
Ceanothus fresnensis
Draba praealta
Festuca minutiflora
Hulsea brevifolia
Jensia yosemitana (= *Madia yosemitana*)
Lewisia congdonii
Mimulus laciniatus
Plagiobothrys torreyi var. *torreyi*
Potamogeton epihydrus ssp. *nuttallii*
Scutellaria bolanderi ssp. *bolanderi*

Conversely, we changed occurrence entries from “Actual” to “Expected” where 1998-1999 vegetation plot data were cited as the source of occurrence (U) and cited plots were located in the park but no collection was made, no vouchers were found among herbarium records (Johnson 2003) and the taxon was not included in Botti (2001). Specifically, this change applied to *Hackelia floribunda*, *Isoetes bolanderi* var. *pygmaea* (var. not recognized by Hickman or Botti), *Achnatherum webberi*. An effort will be made to find, collect and verify these taxa in the park.

We stored “Expected” taxa on a separate watch list (MS Access database table) so they can be sought by field botanists working in the park: “Watch List-potentially occurring Spec Status Plant Spp for YNP.”

Further Revision of Special Status Plant Species List for Yosemite – Further Additions

In addition to taxa in the draft Jones & Stokes list and the previous version of Yosemite's special status plant list, we discovered additional taxa occurring in Yosemite that have CNPS status through review of Taylor (2002), Johnson (2003) and Botti (2001) (Table 1). If taxa are listed by CNPS and are included in Botti (2001), they generally were accepted onto the new list. The exception is *Salix brachycarpa* ssp. *brachycarpa* for which we found no specimens from Yosemite. Botti includes the *Salix* but says it occurs on the east slope of the Sierra Nevada and *possibly* in Yosemite; Hickman (1993) lists the range as central High Sierra Nevada (Mono Co) which is east of the park.

If taxa are listed by CNPS and are included in Johnson (2003), they generally were accepted onto the new list. There are nine exceptions with weak or nonexistent evidence of occurrence in Yosemite. Only one purported specimen of *Balsamorhiza hookeri* var. *lanata* is recorded from the park (Big Meadow, 1929), its published range is the northern Cascade Ranges (Shasta Valley, Siskiyou Co.) and Botti (2001) states “its presence in the park is doubtful.” There is one purported specimen of *Calycadenia oppositifolia* from 1941, it was not included in Botti and its range extends south only to the northern Sierra Nevada Foothills. *Clarkia gracilis* ssp. *albicaulis*, *Dryopteris filix-mas*, *Epilobium oreganum*, *Eschscholzia hypocoides*, *Hulsea nana*, *Platanthera stricta* and *Rosa pinetorum* also have single early putative collections each, with ranges well-separated from Yosemite and are not included in Botti (2001).

Table 1. Additional taxa with record of occurrence in or near Yosemite National Park that are included in California Native Plant Society's Inventory of Rare and Endangered Plants of California, 6th Edition, and were identified during reviews of Johnson (2003), Taylor (2002) and Botti (2001).

Scientific Name	Included on Yosemite List	CNPS List	Source	Botti 2001	# Collections/ Date Last Collected
Actually occurring taxa					
<i>Arabis repanda</i> var. <i>greenei</i>	Y	4	Botti	X	*
<i>Balsamorhiza hookeri</i> var. <i>lanata</i>	N	1B	Johnson	X	1 / 1929
<i>Bulbostylis capillaris</i>	Y	4	Johnson, Taylor	X	14 / 1940
<i>Calycadenia oppositifolia</i>	N	1B	Johnson	-	1 / 1941
<i>Carex buxbaumii</i>	Y	4	Johnson, Taylor	X	14 / 1958
<i>Clarkia gracilis</i> ssp. <i>albicaulis</i>	N	1B	Johnson	-	1 / No date
<i>Cordylanthus rigidus</i> ssp. <i>brevibracteatus</i>	Y	4	Johnson	-	2 / 1965
<i>Cryptantha glomeriflora</i>	Y	4	Johnson	X	1 / 1936
<i>Dryopteris filix-mas</i>	N	2	Johnson	-	1 / 1958
<i>Epilobium oregonum</i>	N	1B	Johnson	-	6 / 1981
<i>Eschscholzia hypocoides</i>	N	4	Johnson	-	1 / 1929
<i>Fritillaria pinetorum</i>	Y	4	Botti	X	*
<i>Hulsea nana</i>	N	2	Johnson	-	1 / 1935
<i>Platanthera stricta</i>	N	4	Johnson	-	1 / 1937
<i>Polystichum kruckebergii</i>	Y	4	Taylor	-	1 (CalFlora) / no date
<i>Rhynchospora alba</i>	Y	2	Botti, Taylor	X	*
<i>Rosa pinetorum</i>	N	1B	Johnson	-	1 / 1969
<i>Salix brachycarpa</i> ssp. <i>brachycarpa</i>	N	2	Botti	X	*
<i>Sparganium natans</i>	Y	4	Johnson, Taylor	-	3 / 1958
<i>Stellaria obtusa</i>	Y	4	Johnson, Taylor	-	1 / 1938
<i>Triteleia lugens</i>	Y	4	Johnson	-	2 / 1957
<i>Utricularia minor</i>	Y	4	Johnson, Taylor	-	1 / 1938
<i>Viburnum ellipticum</i>	Y	2	Johnson	-	1 / 1930
	Expected List				# Coll / Jepson Range
Expected taxa					
<i>Cinna bolanderi</i>	Y	4	Taylor	-	* / c&s SNH
<i>Clarkia virgata</i>	Y	4	Taylor	-	* / n&c SN
<i>Eleocharis parvula</i> (var. <i>parvula</i>)	Y	4	Taylor	-	* / NCo, GB, D
<i>Poa abbreviata</i> ssp. <i>pattersonii</i>	Y	2	Taylor	-	* / SNH
<i>Utricularia intermedia</i>	Y	2	Taylor	-	* / SNH

* No voucher specimens located

Of the taxa included in Taylor (2002), we accepted those listed by CNPS for which Taylor cited documented occurrence in the park (voucher specimen, type locality, or reported in literature), we could verify existence of one or more vouchers and the park lies within the published species' range. Other taxa for which Taylor (2002) cited documented occurrence in the park were added to the "Watch" list and were not included in the revised list for the following reasons:

Taxon	Reason for not including species on YNP list of special status vascular plants
<i>Cinna bolanderi</i>	No voucher specimens from Yosemite. To be added to list if/when type locality/voucher data are found
<i>Clarkia virgata</i>	No voucher specimens from Yosemite found. Specimen cited by Taylor was from location outside of YNP per CalFlora
<i>Eleocharis parvula</i> var. <i>parvula</i>	No voucher specimens from Yosemite found. Specimen cited by Taylor was from location outside of YNP per CalFlora
<i>Poa abbreviata</i> ssp. <i>pattersonii</i>	No voucher specimens from Yosemite found. Reported from Mono Co. (outside YNP) per Taylor and CalFlora.
<i>Utricularia intermedia</i>	No voucher specimens from Yosemite found. Taylor cites specimen, but closest specimen listed in CalFlora is from Fresno Co.

Rationales for Inclusion on Special Status Plant Species List for YNP

We identified 14 standard rationales for including taxa on the Yosemite list (stored in RATIONALE field) given evidence of occurrence in the park. These can be viewed as categories of rarity as well. Multiple rationales may apply to taxa listed by more than one agency or the California Native Plant Society. Where USFWS, USFS, California state or CNPS listings apply, only those rationales for listing were entered (i.e., Park Sensitive was not added to the listing status if listed elsewhere, making Park Sensitive non-inclusive). We listed rationales 9-11, 13-14 where listing by the above entities did not apply but there was sufficient evidence of rarity to include a species on the list.

1. FT or FE: Federally listed as Threatened or Endangered (USFWS 2003a)
2. CA Rare or CA Endangered: Listed by the state of California under California Endangered Species Act or the California Native Plant Protection Act as Rare or Endangered
3. FSS: Forest Service Sensitive; Sensitive plant list of adjacent National Forest (Sierra, Stanislaus, Inyo, Toiyabe)
4. CNPS 1B: Rare or Endangered in CA and elsewhere (CNPS 2001)
5. CNPS 2: Rare or Endangered in CA, more common elsewhere (CNPS 2001)
6. FSC or SLC: Federal Species of Concern or Species of Local Concern for Yosemite area (USFWS 2003b)
7. CNPS 3: Review list (CNPS 2001)
8. CNPS 4: Watch list (CNPS 2001)
9. Limited distribution in YNP and CA: native range limited to narrow geographic areas of California, e.g., central Sierra Nevada, and known from few locations in YNP
10. SN endemic: native range restricted to the Sierra Nevada bioregion
11. Limited distribution in CA/common in YNP: vouchered from fewer than 6 – 10 Jepson Manual bioregions/common in YNP according to Botti (2001) and Johnson (2003)
12. FSW: Forest Service Watch list; Sensitive plant watch list of adjacent Forest (Sierra, Stanislaus, Inyo, Toiyabe)
13. Wide distribution in CA/limited distribution in YNP: native range includes multiple (>5) Jepson Manual bioregions/known from few locations in Yosemite
14. Widespread but uncommon/poorly documented in CA/common in YNP

To further clarify rationale number six, we include the following definitions:

FSC: The Sacramento Fish & Wildlife Office maintains a list of Species of Concern. These species receive no legal protection and the use of the term does not mean that they will eventually be proposed for listing. Species of Concern is an informal term that

refers to those species that the USFWS believes might be declining or be in need of concentrated conservation actions to prevent decline (USFWS 2003b).

SLC: USFWS uses the term Species of Local Concern when they know that a species is having problems in only part of its range. Those taxa for which SLC is indicated were returned for Tuolumne, Mariposa and/or Madera Counties and sources indicated documented occurrence in YNP (USFWS 2003b).

We also developed standard rationale entries for “Expected” or potentially occurring taxa that went on the YNP “Watch” list. For the most part, there is no evident documentation for these taxa for occurrence in the park, but the park is within the natural range of the species.

15. Regional endemic/park located within range
16. Special-status species/park located within range
17. Special-status species/park located at margin of range
18. Limited distribution in CA/park located within range
19. Widespread but poorly documented in CA/park located within range
20. Wide distribution in CA/park located at margin of range

We have archived additional rationale entries for taxa *not* included in the Yosemite special status plant species list nor the “Watch” list to document decision making.

21. Special-status species, park out of range
22. Widespread but uncommon/poorly documented in CA/park out of range

Sources of occurrence information

Jones & Stokes cited 16 sources that document species occurrence or potential occurrence in Yosemite (D – U). They consist largely of local national forest sensitive plant lists (taxa not federally listed but candidate species or those listed by CNDDDB), local national forest watch lists (species meeting any of five criteria for species of special management concern) and local or web-based databases containing vouchers collections or reported occurrences.

- D. Sierra National Forest Sensitive Plant List
- E. Sierra National Forest Sensitive Plant WATCH List
- F. Sequoia Forest Federal/R5 Sensitive Plant List
- H. Inyo National Forest Sensitive Plant List
- I. Inyo National Forest Sensitive Plant WATCH list
- J. CNDDDB results for Yosemite National Park
- K. CNPS results for Yosemite National Park
- L. CNDDDB results for Devil's Postpile National Monument
- M. CNPS results for Devil's Postpile National Monument
- N. A Plant Check List for Devil's Postpile National Monument
- O. Stanislaus National Forest Sensitive Species List
- P. Stanislaus National Forest Watch List and Forest Plants of Special Interest
- R. CalFlora Database
- S. Rare Plants of Yosemite National Park (Botti 1992)
- T. Yosemite Valley Plan FEIS
- U. 1998-1999 vegetation mapping data for Yosemite National Park

We added six additional sources that document species occurrence or potential occurrence in Yosemite:

- A1. Toiyabe National Forest Sensitive Plant List
- H*. Inyo National Forest Sensitive Plant List 2003
- I*. Inyo National Forest Sensitive Plant Watch List 2003

- V. Taylor 2002
- W. Botti 2001
- X. Johnson 2003
- Y. USFWS 2003a or USFWS 2003b
- Z. [California Native Plant Society](#). 1997. *[Inventory of Rare and Endangered Plants of California](#)*. (database) Rare Plant Scientific Advisory Committee, California Native Plant Society. Sacramento, CA.

All sources that apply are listed in the database table storing the special status plant list for Yosemite by taxon (see below).

Special Status Plant Species List – Yosemite 2003 (database)

The database, *Special Status Plant Species List –Yosemite 2003*, was developed using MS Access, the NPS Inventory and Monitoring Program standard. It contains two tables. One table, “Special Status Vascular Plant Species List for YNP-2003,” stores a list of 135 taxa comprising the 2003 special status plant species for Yosemite National Park. The second table, “Watch List-potentially occurring Spec Status Plant Spp for YNP,” stores a list of 41 taxa that have no evident documentation of occurrence in the park, but for which the park is within or at the margin of the natural range.

The database tables are based on the structure of the November 2001 draft special status plant species database submitted by Jones & Stokes (Sacramento, CA) but include the following modifications. The field FEDSTATUS was divided into two fields: 1) USFWS to store federal regulatory status under the Endangered Species Act or U.S. Fish and Wildlife Service Species of Concern (maintained by the USFWS Sacramento Office) and 2) USFS for storing U.S. Forest Service listing status. Fields were added to indicate CNPS R-E-D Codes and Yosemite National Park sensitive status. The Distribution field was separated into distribution by Jepson Manual bioregion (BIOREG_DISTRIB) and distribution by county (CO_DISTRIB) where that information could be accurately obtained. Elevation ranges were added in ELEV_LOW and ELEV_HIGH fields to store elevation ranges from the Jepson Manual. A COMMENT field was added to store notes on occurrence and rarity. **Table 2** contains field definitions for the special status plant species list; **Table 3** contains field definitions for the watch list. Redundancy between the two tables is purposeful to provide for stand-alone documentation for each database table. This will ease sharing of the lists with staff and outside agencies and organizations. Where definitions differ for the “Watch” list, indications are made in Table 3.

Detailed metadata for this database will be entered into the Spatial Metadata Management System (SMMS) by September 2003.

Table 2. Table structure for “**Special Status Vascular Plant Species List** for YNP-2003” in the Special Status Plant Species List –Yosemite 2003.mdb database, including field names, field types and field and code definitions.

<u>Field Name</u>	<u>Type</u>	<u>Comments</u>
SCIENTIFICNAME	Text	Scientific name without authorities following the nomenclature in The Jepson Manual (Hickman 1993)
COMMONNAME	Text	A currently recognized common name. Common names of plants are not standardized. Some plants have more than one common name, and some common names have more than 1 variant. The common names used here were obtained from the CNPS Inventory, CalFlora database, Hrusa 2001 or Botti 2001.
FAMILY	Text	The family in which the taxon is included, following the nomenclature in The Jepson Manual. Plant families are currently undergoing systematic revision, largely due to insights based on studies of molecular information, and the placement of some of the taxa in this list are or will be different in upcoming taxonomic publications.
USFWS	Text	The federal regulatory status under the Endangered Species Act.
USFS		Forest Service listing status among adjacent forests (Stanislaus, Sierra, Inyo, Toiyabe): FSS =Forest Service

<u>Field Name</u>	<u>Type</u>	<u>Comments</u>
		Sensitive Plant List, FSW =Forest Service Sensitive Plant Watch List.
STATSTATUS	Text	The state listing under the California Endangered Species Act (CE = endangered) or the California Native Plant Protection Act (CR = rare).
CNPSLIST	Text	The California Native Plant Society (CNPS) monitors the distribution and rarity of plants in California and ranks them according to their vulnerability to extinction. The lists of taxa are published in CNPS's <i>Inventory of Rare and Endangered Plants of California</i> (6 th Edition, 2001) 1B. Rare or Endangered in California and elsewhere 2. Rare or Endangered in California, more common elsewhere 3. Plants for which we need more information - Review list 4. Plants of limited distribution - Watch list
CNPS_R-E-D Code	Text	CNPS R-E-D codes distinguish among the separate factors that contribute to their list assignments. These are: <u>Rarity</u> -addresses numbers of individuals and distribution within California; <u>Endangerment</u> -addresses the plant's vulnerability to extinction for any reason; and <u>Distribution</u> -describes the overall range of the plant. Together these three elements form the CNPS R-E-D Code. Each element in the code is divided into three classes or degrees of concern, represented by the number 1, 2, or 3. In each case, higher numbers indicate greater concern. <u>R - Rarity</u> 1 - Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time 2 - Distributed in a limited number of occurrences, occasionally more if each occurrence is small 3 – Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported <u>E - Endangerment</u> 1 - Not endangered 2 - Endangered in a portion of its range 3 - Endangered throughout its range <u>D - Distribution</u> 1 - More or less widespread outside California 2 - Rare outside California 3 - Endemic to California

<u>Field Name</u>	<u>Type</u>	<u>Comments</u>
YOSE_STATUS	Text	Park Sensitive (PS) designation is made for reasons of limited distribution, local rarity, range limits when taxa are not otherwise listed by a regulatory authority or NGO; among taxa listed as Park Sensitive, specific categories are reflected in the standardized rationales for inclusion on the park's special status vascular plant list (rationales 9-11, 13-14)
BIOREG_DISTRI	Text	Range description for the taxon. The range information follows the geographic subdivisions described in The Jepson Manual (Hickman 1993).
CO_DISTRI	Text	Distribution by county according to CalFlora (2002), CNPS <i>Inventory</i> , 6 th edition (2001) or based on voucher specimens according to the Jepson Online Interchange (2002). County distribution is less readily available since CalFlora (2002) went offline.
CO_SOURCE	Text	Source of county distribution information: CalFlora=CalFlora 2001, CNPS=CNPS 2001, Jepson=Baldwin et al. 2003. The Jepson Online Interchange web site represents only those counties from which Jepson/University Herbaria have specimens, so it represents a minimum county distribution and is not necessarily comprehensive
ELEV_LOW	Text	Lower end of elevation range according to The Jepson Manual (Hickman 1993) expressed in meters. An asterisk (*) in this field indicates the elevation is expressed as "less than" the elevation in the ELEV_HIGH field.
ELEV_HIGH	Text	Upper end of elevation range according to The Jepson Manual (Hickman 1993) expressed in meters. An asterisk (*) in this field indicates the elevation is expressed as "greater than" the elevation in the ELEV_LOW field.
VEGTYPENAR	Text	A narrative description of the vegetation types and/or habitats in which the taxon occurs. Some were excerpted from CalFlora entries; those commonly cite Lum 1975, Walker 1992 for plant communities. May also include wetland affinity and elevation range.
FLWRPERIOD	Text	The general period during which the plants are in bloom (indicated in months). This is the period when many plants, especially herbaceous plants, are most readily evident and identifiable. For taxa added after submission of proposed list from contractor (Nov 2001, Jones & Stokes, Sacramento, CA), flowering period is from Botti (2001).
OCCUR	Text	Identifies whether there is documented occurrence of the taxon within Yosemite National Park. All taxa on special status vascular plant species list have documented occurrence in the park and are labeled "A" for actual occurrence. "E" is used in the OCCUR field in the "Watch" list table to indicate potential or "expected" occurrence.

<u>Field Name</u>	<u>Type</u>	<u>Comments</u>
		A = Actual: recorded from the park
RATIONALE	Text	<p>Reason for including the taxon on the list. All species with federal or state status or on a CNPS list were included if occurring in the park. Species lacking state or federal status or not on a CNPS list were included if their distribution and abundance was determined to be limited based on voucher records (Johnson 2003 or CalFlora 2002), Botti (2001) comments, Taylor (2002).</p> <p>Standard rationale entries were made for reasons of consistency and to categorize reasons for inclusions as Park Sensitive (rationales 9-11, 13-14):</p> <ol style="list-style-type: none"> 1. FT or FE: Listed as Threatened or Endangered by the USFWS under the Endangered Species Act. 2. CA Rare (CR) or CA Endangered (CE): Listed by the state of California under California Endangered Species Act or the California Native Plant Protection Act 3. FSS: Occurs on the Sensitive Plant List of a National Forest adjacent to Yosemite (Sierra, Stanislaus, Inyo, Toiyabe) 4. CNPS 1B: Listed by the California Native Plant Society as rare or endangered in CA and elsewhere 5. CNPS 2: Listed by the California Native Plant Society as rare in CA, more common elsewhere 6. FSC or SLC: Federal Species of Concern or Species of Local Concern for Yosemite area (USFWS 2003b) 7. CNPS 3: Listed by the California Native Plant Society as species about which more information is needed; a review list 8. CNPS 4: Listed by the California Native Plant Society as species of limited distribution; a watch list 9. Limited distribution in YNP and CA: native range limited to narrow geographic areas of California, e.g., central Sierra Nevada/known from few locations in YNP 10. SN endemic: native range restricted to the Sierra Nevada bioregion 11. Limited distribution in CA/common in YNP: vouchered from fewer than about 6 Jepson Manual bioregions/common in YNP according to Botti (2001) 12. FSW: Included on a sensitive plant watch list of an adjacent National Forest (Sierra, Stanislaus, Inyo, Toiyabe) 13. Wide distribution in CA/limited distribution in YNP: native range includes multiple (>5) Jepson Manual bioregions/known from few locations in Yosemite 14. Widespread but uncommon/poorly documented in CA/common in YNP

<u>Field Name</u>	<u>Type</u>	<u>Comments</u>
SOURCE	Text	<p>Source of information documenting occurrence of taxon in Yosemite National Park or species listing status. All letter source codes that apply are listed in this field for each taxon.</p> <p>A1. Toiyabe National Forest Sensitive Plant List 2002 D. Sierra National Forest Sensitive Plant List E. Sierra National Forest Sensitive Plant WATCH List F. Sequoia Forest Federal/R5 Sensitive Plant List H. Inyo National Forest Sensitive Plant List 1998 H*. Inyo National Forest Sensitive Plant List 2002 I. Inyo National Forest Sensitive Plant WATCH list 1998 I*. Inyo NF Sensitive Plant Watch list 2002 J. CNDDDB results for Yosemite National Park K. CNPS results for Yosemite National Park L. CNDDDB results for Devil's Postpile National Monument M. CNPS results for Devil's Postpile National Monument N. A Plant Check List for Devil's Postpile National Monument O. Stanislaus National Forest Sensitive Species List P. Stanislaus National Forest Watch List and Forest Plants of Special Interest R. CalFlora Database S. Rare Plants of Yosemite National Park (Botti 1992) T. Yosemite Valley Plan FEIS U. 1998-1999 vegetation mapping data for Yosemite National Park (98-99 veg mapping data.mdb) V. Taylor 2002 W. Botti 2001 X. Johnson 2003 Y. USFWS 2003a or 2003b Z. California Native Plant Society. 1997. Inventory of Rare and Endangered Plants of California (database), Rare Plant Scientific Advisory Committee, CNPS. Sacramento, CA.</p>
COMMENTS	Text	<p>Comments on occurrence and rarity according to herbarium vouchers, Botti (2001), Taylor (2002); suitable habitat per Taylor (2002); endemism per CalFlora or Taylor (2002)</p>

Table 3. Table structure for “**Watch List**-potentially occurring Spec Status Plant Spp for YNP” in the Special Status Plant Species List –Yosemite 2003.mdb database, including field names, field types and field and code definitions.

<u>Field Name</u>	<u>Type</u>	<u>Comments</u>
SCIENTIFICNAME	Text	Scientific name without authorities following the nomenclature in The Jepson Manual (Hickman 1993)
COMMONNAME	Text	A currently recognized common name. Common names of plants are not standardized. Some plants have more than one common name, and some common names have more than 1 variant. The common names used here were obtained from the CNPS Inventory, CalFlora database, Hrusa 2001 or Botti 2001.
FAMILY	Text	The family in which the taxon is included, following the nomenclature in The Jepson Manual. Plant families are currently undergoing systematic revision, largely due to insights based on studies of molecular information, and the placement of some of the taxa in this list are or will be different in upcoming taxonomic publications.
USFWS	Text	The federal regulatory status under the Endangered Species Act.
USFS		Forest Service listing status among adjacent forests (Stanislaus, Sierra, Inyo, Toiyabe): FSS =Forest Service Sensitive Plant List, FSW =Forest Service Sensitive Plant Watch List.
STATSTATUS	Text	The state listing under the California Endangered Species Act (CE = endangered) or the California Native Plant Protection Act (CR = rare).
CNPSLIST	Text	The California Native Plant Society (CNPS) monitors the distribution and rarity of plants in California and ranks them according to their vulnerability to extinction. The lists of taxa are published in CNPS's <i>Inventory of Rare and Endangered Plants of California</i> (6 th Edition, 2001) 1B. Rare or Endangered in California and elsewhere 2. Rare or Endangered in California, more common elsewhere 3. Plants for which we need more information - Review list 4. Plants of limited distribution - Watch list
CNPS_R-E-D Code	Text	CNPS R-E-D codes distinguish among the separate factors that contribute to their list assignments. These are: <u>Rarity</u> -addresses numbers of individuals and distribution within California; <u>Endangerment</u> -addresses the plant's vulnerability to extinction for any reason; and <u>Distribution</u> -describes the overall range of the plant. Together these three elements form the CNPS R-E-D Code. Each element in the code is divided into three classes or degrees of concern, represented by the number 1, 2, or 3. In each case, higher numbers indicate greater concern.

Field Name	Type	Comments
		<p><u>R - Rarity</u></p> <p>1 - Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time</p> <p>2 - Distributed in a limited number of occurrences, occasionally more if each occurrence is small</p> <p>3 – Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported</p> <p><u>E - Endangerment</u></p> <p>1 - Not endangered</p> <p>2 - Endangered in a portion of its range</p> <p>3 - Endangered throughout its range</p> <p><u>D - Distribution</u></p> <p>1 - More or less widespread outside California</p> <p>2 - Rare outside California</p> <p>3 - Endemic to California</p>
DISTRIBUTION	Text	Range description for the taxon. The range information follows the geographic subdivisions described in The Jepson Manual and/or lists counties of documented occurrence per CalFlora (2002).
VEGTYPENAR	Text	A narrative description of the vegetation types and/or habitats in which the taxon occurs. Some were excerpted from CalFlora entries; those commonly cite Lum 1975, Walker 1992 for plant communities. May also include wetland affinity and elevation range
FLWRPERIOD	Text	The general period during which the plants are in bloom. This is the period when many plants, especially herbaceous plants, are most readily evident and identifiable (indicated in months). For taxa added after submission of proposed list from contractor (Nov 2001, Jones & Stokes, Sacramento, CA), flowering period is from Botti (2001).
OCCUR Differs from Table 2	Text	Identifies whether there is documented occurrence of the taxon within Yosemite National Park. Once documentation of occurrence in the park is obtained (voucher specimen), species should be considered for removal from "Watch" list, addition to special status species list and OCCUR changed to "A" for actual occurrence. E = Expected: potentially occurs in the park because park is located within species range or at margin of range
RATIONALE Differs from Table 2	Text	Reason for including the taxon on the "Watch" list. All species with federal or state status or on a CNPS list were included if potentially occurring in the park. Some taxa lacking state, federal or CNPS status were included if the park is within the

Field Name	Type	Comments
		<p>species range and their distribution and abundance were determined to be limited based on voucher records (Johnson 2003 or CalFlora 2002), Botti (2001) comments, Taylor (2002). Standard rationale entries were made for reasons of consistency and to categorize reasons for inclusions on the "Watch" list.</p> <ul style="list-style-type: none"> 15. Regional endemic/park located within range 16. Special-status species/park located within range 17. Special-status species/park located at margin of range 18. Limited distribution in CA/park located within range 19. Widespread but poorly documented in CA/park located within range 20. Wide distribution in CA/park located at margin of range
SOURCE	Text	<p>Source of information documenting potential species occurrence in Yosemite National park or species listing status.</p> <ul style="list-style-type: none"> A1. Toiyabe National Forest Sensitive Plant List 2002 D. Sierra National Forest Sensitive Plant List E. Sierra National Forest Sensitive Plant WATCH List F. Sequoia Forest Federal/R5 Sensitive Plant List H. Inyo National Forest Sensitive Plant List 1998 H*. Inyo National Forest Sensitive Plant List 2002 I. Inyo National Forest Sensitive Plant WATCH list 1998 I*. Inyo NF Sensitive Plant Watch list 2002 J. CNDDDB results for Yosemite National Park K. CNPS results for Yosemite National Park L. CNDDDB results for Devil's Postpile National Monument M. CNPS results for Devil's Postpile National Monument N. A Plant Check List for Devil's Postpile National Monument O. Stanislaus National Forest Sensitive Species List P. Stanislaus National Forest Watch List and Forest Plants of Special Interest R. CalFlora Database S. Rare Plants of Yosemite National Park (Botti 1992) T. Yosemite Valley Plan FEIS U. 1998-1999 vegetation mapping data for Yosemite National Park (98-99 veg mapping data.mdb) V. Taylor 2002 W. Botti 2001 X. Johnson 2003 Y. USFWS 2003a or 2003b Z. California Native Plant Society. 1997. Inventory of Rare and Endangered Plants of California (database), Rare Plant Scientific Advisory Committee, CNPS. Sacramento, CA.
COMMENTS	Text	<p>Comments on occurrence and rarity according to herbarium vouchers, Botti (2001), Taylor (2002); suitable habitat per Taylor; endemism per CalFlora or Taylor</p>

Prioritization of Taxa for Surveys

We categorized each of the 135 taxa on the Special Status Vascular Plant Species List for YNP-2003 according to a list of 14 standard rationales for inclusion on the list. The rationales indicate listing status among several government and nongovernmental entities as well as categories of Park Sensitive status. The order of rationales indicates the priority order in which species will be considered for field surveys. Because taxa may be assigned multiple rationales, the highest rationale number assigned is the one that applies. Table 4 lists rationales in survey priority order and the number of taxa currently in each priority category. See the MS Access database table, "Special Status Plant Species List – Yosemite 2003" for species in each priority category.

Table 4. Rationales for including taxa on Special Status Vascular Plant Species List for YNP-2003 in field survey priority order with number of taxa falling into each priority category. Some taxa have designated status by multiple entities (e.g., CA Rare and CNPS List 1B). In those cases, the effective priority category is the highest one that applies to a species.

Rationale # / Priority Cat. #	Rationale / Priority Category	Taxa Count by Priority Category	Effective Priority (Count by First Occurring Priority Categ.)
1	FT or FE - Federally listed as Threatened or Endangered	0	0
2	CA Rare or CA Endangered	4	4
3	FSS - Forest Service Sensitive	13	10
4	CNPS List 1B	15	3
5	CNPS List 2	12	12
6	Federal Species of Concern or Species of Local Concern	10 and 2	0
7	CNPS List 3	2	0
8	CNPS List 4	29	29
9	Limited distribution in YNP and CA	25	22
10	SN endemic	20	6
11	Limited distribution in CA/common in YNP	3	3
12	Forest Service Watch list	21	1
13	Wide distribution in CA/limited distribution in YNP	43	42
14	Widespread but uncommon/poorly documented in CA/common in YNP	4	4

There are currently no plant taxa known to occur in Yosemite that have been listed by the U.S. Fish and Wildlife Service under the Endangered Species Act as Threatened or Endangered. There are currently no plant taxa known to occur in Yosemite that are candidates for listing under the Endangered Species Act. Neither do any federally listed or federal candidate species occur on the watch list. If or when the occurrence of a species federally listed as Endangered or Threatened is documented in the park, it would be added to the Special Status Vascular Plant Species List for Yosemite and assigned first priority for

surveys. The NPS would work with the USFWS to inventory and periodically monitor those taxa to provide data for directing and evaluating the success of recovery actions (USDI, NPS 1991).

California state listed taxa are second priority, acknowledging guidance in NPS-77 that specifies management of state Endangered and Threatened Species “should, to the greatest extent possible, parallel the management of federally listed species” (USDI, NPS 1991).

Similarly, those taxa occurring in the park that are designated “Sensitive Species” by Region 5 of the Forest Service and occur on an adjacent national forest are given high priority for surveys. Region 5 of the Forest Service identifies species as “Sensitive” if they have any of the following rankings AND they are on Forest Service lands in the region or are highly likely to occur on Forest lands based on habitat and range information AND there is enough information to make a determination regarding effects of management activities (USDA, Forest Service 1998).

- US Fish and Wildlife Service federal candidates; or
- Natural Heritage global ranking of G1(T1), G2(T2), or G3(T3); or
- Natural Heritage national ranking or N1, N2, or N3 (for animals)

In addition, species that do not meet the criteria above, may be added to the Forest Service Sensitive Species list if a compelling case regarding the species biology, rarity, or management concerns is made. Including Forest Service Sensitive Species on the list and surveying appropriate habitat will contribute to regional monitoring of their status.

The Sacramento Office of the U.S. Fish and Wildlife Service maintains a list of Species of Concern and Species of Local Concern for their region of responsibility in central California. Species of concern is an informal term that refers to those species they believe may be declining or be in need of concentrated conservation actions to prevent decline. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species. They use the term Species of Local Concern when they know that a species is having problems in only part of its range. For these compelling reasons, taxa assigned this designation were placed relatively high in priority order for surveys.

The California Native Plant Society does extensive research on the status and distribution of native plant species with each update to their *Inventory* (CNPS 2001). Their lists 1B and 2 are comprised of species Rare or Endangered throughout California and thus deserve high priority for surveys and perhaps monitoring. Through List 3, CNPS specifically requests information on distribution, endangerment, ecology and taxonomic validity. Yosemite surveys could contribute to furthering understanding of these species' status. In contrast to these lists, CNPS List 4 represents species of limited distribution or infrequent occurrence with apparent low vulnerability when the *Inventory* went to press. Species on List 4 were placed at approximately the same survey priority level as other species of limited distribution in the state as well as YNP.

Species with “limited distribution in YNP and CA” have native ranges limited to narrow geographic areas of California, e.g., central Sierra Nevada, and are known from few locations in YNP. They have no legal status or status with CNPS but don't have broad distributions even though they may be locally common where they occur outside the park.

Endemic species, those not naturally found anywhere else in the world, make up 48% of the plant species diversity in the California Floristic Province (excluding the Great Basin east of the Sierra Nevada and the deserts) (Raven 1988). The Forest Service uses local endemism as a criterion in compiling its sensitive plant lists. Similarly, we use regional endemism as a consideration for listing as Park Sensitive and suggest a moderate survey priority level following listed taxa and those with more limited distributions.

Among those with lower priority level for surveys are species with “limited distribution in CA/common in YNP” and Forest Service Watch list species. Some species common in Yosemite are not widely distributed in California and, have been recommended for inclusion on the special status plant list by

experts on the Yosemite flora. Currently, these are limited to *Arabis holboellii* var. *pendulocarpa* (central High Sierra Nevada), *Carex fissuricola* (central and southern High Sierra Nevada) and *C. haydeniana* (central and southern High Sierra Nevada, Warner Mountains). Some plant species reviewed but not included on the Forest Service Regional Forester's Sensitive List, may be deemed by a forest to be of sufficient concern to include them on a "Watch" list. This includes species that "are locally rare (as opposed to declining throughout their range), are of public concern, occur as disjunct populations, are newly described taxa, or lacking sufficient information on population size, threats, trend, or distribution" (USDA, Forest Service 1998). "Watch" lists are assembled by forests for the express purpose of assisting in the maintenance of biodiversity under the provisions of National Forest Management Act.

Species with "wide distribution in CA/limited distribution in YNP" may be quite common in California as a whole but, due to elevational ranges, geographic ranges, available habitat, etc. appear to have quite limited distribution within Yosemite National Park or El Portal Administrative Unit. In accordance with NPS policy and guidelines, these taxa are included designated Park Sensitive following the definition of "sensitive."

The rationale, "Widespread but uncommon/poorly documented in CA/common in YNP," consists of taxa brought to our attention by Jones & Stokes. These are taxa with narrow distributional ranges, that are either uncommon in California or simply have not been documented sufficiently to reflect relative commonness. At the same time, there is no indication in Botti (2001) or in herbarium collections that they are uncommon in Yosemite. They are included on the list because there are questions about their commonness, and surveys, if funded, would inform management.

Obtaining information from the database

Reports are available in the database for obtaining printable lists for Yosemite and the El Portal Administrative Site of the following: **1)** federally listed species or species of concern, **2)** California state-listed taxa, **3)** Forest Service Sensitive and Forest Service Watch List species, **4)** plant species listed by the California Native Plant Society, **5)** Species of limited distribution in CA and YNP, **6)** Sierra Nevada endemics and **7)** Species of limited distribution in CA/common in YNP. Additional reports will be added for other groups of taxa.

Additional queries may be created in the database by working through the NPS Botanist at Yosemite.

Bibliography

- Baldwin, B.G., S. Boyd, B.J. Ertter, R.W. Patterson, T.J. Rosatti, and D.H. Wilken (eds). 2003. **The Jepson Online Interchange**. [web application] University of California, Berkeley. Available: <http://ucjeps.berkeley.edu/interchange.html>. [Accessed: April 2003]
- Botti, S. J. 1992. **Rare Plants of Yosemite National Park**. Unpublished report submitted to the National Park Service. 10 p.
- Botti, S. J. 2001. **An illustrated flora of Yosemite National Park**. Yosemite Association, El Portal, CA. 484 p.
- CalFlora**: Information on California plants for education, research and conservation. [web application] 2002. Berkeley, California: The CalFlora Database [a non-profit organization]. Available: <http://www.calflora.org/>. [Accessed: December 2002]
- Calif. Dept. Fish and Game. April 2003. **State and Federally Listed Endangered, Threatened, and Rare Plants of California**. [web document] Habitat Conservation Division Wildlife & Habitat Data Analysis Branch, California Natural Diversity Database. <http://www.dfg.ca.gov/whdab/TEPlants.pdf> [accessed April 2003]

- California Native Plant Society. 2001.
Inventory of Rare and Endangered Plants of California (sixth edition). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society, Sacramento, CA. 387 p.
- Hickman, J. C. (ed.). 1993.
The Jepson Manual: Higher plants of California. University of California Press, Berkeley, CA. 1400 p.
- Hrusa, G. Frederic 19 December 2001.
"Common names for California Plants". Unpublished database compilation (Jcom_name.DBF) California Department of Food and Agriculture, Herbarium CDA.
- Johnson, B. 2003.
Yosemite Flora.mdb. 2/20/2003 version. MS Access database containing records on specimens from Yosemite National Park held at regional herbaria, including University/Jepson Herbaria, Berkeley, CA; California Academy of Science, San Francisco, CA; San Jose State Herbarium, CA; Yosemite Museum Herbarium. 9539 specimen records representing 1560 taxa.
- Lum, K-L. 1975.
Gross patterns of vascular plant species diversity in California. Unpubl. MS Thesis, Ecology. Univ. of California, Davis. 154 pp.
- National Park Service, Yosemite National Park. 2000.
Final Yosemite Valley Plan Supplemental Environmental Impact Statement. Volume 1, Section III, p. 58-61.
- Raven, P. 1988.
The California Flora. In M. Barbour and J. Major (eds.). Terrestrial Vegetation of California. California Native Plant Society, Sacramento, Special Publication No. 9, pp. 109-137.
- Skinner, M.W., ed. programmed by David Hudson and Rob Coman. 1994.
California Native Plant Society's electronic inventory of rare and endangered vascular plants of California Version 1.1.1. Sacramento, Calif. : California Native Plant Society, c1994 4 computer disks : col. ; 3 1/2 in. + user's guide (v, 62 p. ; 28 cm.) System requirements: IBM-compatible 80286 or better with 520K of free DOS memory; 10Mb hard disk space; mouse (optional).
- Taylor, D.W. Oct 2002.
Endangered Plant Survey for the PG&E Distribution Line System, Yosemite National Park, Mariposa County and Tuolumne County, California. Unpublished report. Prepared for Technical and Ecological Services, Pacific Gas & Electric Co., San Ramon, CA. 40 p.
- US Fish and Wildlife Service. 2003a.
Sacramento Fish and Wildlife Office endangered species lists. [web application] Available: http://sacramento.fws.gov/es/spp_list.htm. [Accessed February 2003]
- US Fish and Wildlife Service. 2003b.
Sacramento Fish and Wildlife Office: our species of concern. [web document] Available: http://sacramento.fws.gov/es/spp_concern.htm. [Accessed February 2003]
- US Fish and Wildlife Service. 2003c.
Species list for special status plant species habitat modeling, Yosemite National Park. Letter in response to solicited list of federally listed plant taxa for Yosemite National Park, April 10, 2003. 5 p.

US Department of Agriculture, NRCS 1997.

The PLANTS database. (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA

USDA, Forest Service. 1998.

Sensitive Species List 1998. Letter to Forest Supervisors in Region 5 from the Regional Forester regarding Region 5 Sensitive Species List of plants, June 10, 1998. Available: <http://www.fs.fed.us/r5/projects/sensitive-species/rf-letter.html>

US Department of Interior, National Park Service. 1988.

Management Policies, National Park Service, Washington, D.C.

US Department of Interior, National Park Service. 1991.

NPS-77 Natural Resource Management Guideline. Available: <http://www2.nature.nps.gov/nps77/>. National Park Service, Washington, D.C.

Walker, R.E. 1992.

Community models of species richness: regional variation of plant community species composition on the west slope of the Sierra Nevada, California. Unpubl. MA Thesis, Geography. Univ. of California, Santa Barbara. 155 pp.

Appendix A. The California Native Plant Society's (CNPS) Lists and Rarity-Endangerment-Distribution Codes

Excerpted from CNPS's Inventory of Rare and Endangered Plants of California (Sixth edition. CNPS. 2001. David Tibor, Convening Editor. X + 388pp).

- 1A. Presumed extinct in California
- 1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

List 1A: Plants Presumed Extinct in California

The 29 plants of List 1A are presumed extinct because they have not been seen or collected in the wild in California for many years. Although most of them are restricted to California, a few are found in other states as well. In many cases, repeated attempts have been made to rediscover these plants by visiting known historical locations. Even after such diligent searching, we are constrained against saying that they are extinct, since for most of them rediscovery remains a distinct possibility. Note that care should be taken to distinguish between "extinct" and "extirpated." A plant is extirpated if it has been locally eliminated, but it may be doing well elsewhere in its range.

The R-E-D code for List 1A plants does not exist, but is designated by an "*" as a placeholder.

List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere.

The 1021 plants of List 1B are rare throughout their range. All but a few are endemic to California. All of them are judged to be vulnerable under present circumstances or to have a high potential for becoming so because of their limited or vulnerable habitat, their low numbers of individuals per population (even though they may be wide ranging), or their limited number of populations. Most of the plants of List 1B have declined significantly over the last century.

List 2: Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere

Except for being common beyond the boundaries of California, the 417 plants of List 2 would have appeared on List 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Endangered Species Act. Until 1979, a similar policy was followed in California. However, after the passage of the Native Plant Protection Act, plants were considered for protection without regard to their distribution outside the state.

List 3: Plants About Which We Need More Information - A Review list

The 52 plants that comprise List 3 are united by one common theme--we lack the necessary information to assign them to one of the other lists or to reject them. Nearly all of the plants remaining on List 3 are taxonomically problematic.

List 4: Plants of Limited Distribution - A Watch list

The 554 plants in this category are of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low at this time. While we cannot call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a List 4 plant change, we will transfer it to a more appropriate list or deleted from consideration.

CNPS R-E-D Code

With the five CNPS Lists we maintain a simple classification that reflects an overall level of conservation concern. However, rarity and endangerment are not strictly correlated, and our approach to protecting plants that occur only in California is somewhat different from our approach to protecting plants that also occur elsewhere. Developing effective conservation strategies requires that we distinguish among the separate factors that contribute to our List assignments. These are: rarity, which addresses numbers of individuals and distribution within California; endangerment, which addresses the plant's vulnerability to extinction for any reason; and distribution, which describes the overall range of the plant. Together these three elements form the R-E-D Code. Each element in the code is divided into three classes or degrees of concern, represented by the number 1, 2, or 3. In each case, higher numbers indicate greater concern. The system is summarized as follows:

R - Rarity

- 1 Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
- 2 Distributed in a limited number of occurrences, occasionally more if each occurrence is small
- 3 Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported

E - Endangerment

- 1 Not endangered
- 2 Endangered in a portion of its range
- 3 Endangered throughout its range

D - Distribution

- 1 More or less widespread outside California
- 2 Rare outside California
- 3 Endemic to California

For example, an R-E-D Code of 3-3-3 indicates that the plant in question is limited to one population or several restricted ones, that it is endangered throughout its range, and that it is endemic to California.