Vascular Plants of Devils Postpile National Monument, Madera County, California

Hulsea brevifolia

Final Report to the Sierra Nevada Inventory and Monitoring Network
Sequoia and Kings Canyon National Parks
Three Rivers, California 93271

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ABSTRACT

A survey of the vascular flora of Devils Postpile National Monument was conducted in 2001. The two objectives of this survey were: 1) to inventory at least 90 percent of the vascular flora and document it with vouchered specimens; and 2) to describe the distribution and abundance of species of special management concern (rare and/or nonnative). The results of the survey yielded a 125 percent increase (from 169 to 380) in the number of plant taxa documented by voucher specimens in Devils Postpile National Monument. Three rare and eight nonnative taxa that were previously unknown from the monument and 18 potential range extensions were documented.

INTRODUCTION

Devils Postpile National Monument is managed by the National Park Service for its outstanding geologic features and natural beauty. Located in Madera County, California, high on the western slope of the Sierra Nevada near the town of Mammoth Lakes (Figure 1), Devils Postpile attracts thousands of visitors each year (nearly 157,000 in 2001) to view the hexagonal basalt columns for which the monument is named, and the picturesque 30-m drop of Rainbow Falls on the Middle Fork San Joaquin River. Of the 319 ha (798.46 acres) of Devils Postpile National Monument, 299 are designated as part of the Ansel Adams Wilderness, and both the John Muir and Pacific Crest Trails traverse within its borders.

During the summer of 2001, we completed a floristic inventory of the vascular plants in Devils Postpile National Monument (DEPO) and established vegetation plots as part of a vegetation mapping program for Sierra Nevada parks. Both of these efforts are components of the inventory phase of the National Park Service Natural Resource

Inventory and Monitoring Program for the Sierra Nevada Network parks (Devils Postpile National Monument, Sequoia and Kings Canyon National Parks, and Yosemite National Park). The data generated by this program provide resource managers with important feedback between natural resource conditions and management objectives. In keeping with the objectives of the Inventory and Monitoring program, the two main goals of this study were: 1) to document the occurrence of at least 90 percent of the species of vascular plants occurring in Devils Postpile with vouchered specimens; and 2) to describe the distribution and abundance of species of special management concern, specifically, those designated as rare, threatened, endangered or invasive-nonnative.

Prior to this inventory, the percentage of vascular plants documented in Devils Postpile was estimated at 82 percent, with gaps identified mainly in the graminoides (Medeiros, pers. comm.). The flora was known mainly from collections made by park rangers/naturalists in the years 1972, 1977, 1978, and 1980. K. Ann Hoffmann made 77 collections in 1972 representing 77 taxa in 27 families; Joseph L. Medeiros made 42 collections in the period between 1976 and 1980 representing 42 taxa in 21 families; and Sandra C. Morey made 131 collections in 1980 representing 120 taxa in 28 families. The species list produced from these investigators included 235 taxa, however only 169 of these were documented with herbarium vouchers. The labels of these vouchers (housed in the Devils Postpile Herbarium) reveal that 99 percent or more of the collections were made along the Rainbow Falls Trail and in Soda Springs Meadow, both of which are in the eastern half of the monument in the vicinity of Middle Fork San Joaquin River (Figure 2). The need for documented plant occurrence data from Devils Postpile was further emphasized when a query of the University of California/Jepson Herbaria

database (SMASCH – Specimen MAnagement System for California Herbaria) resulted in only ten collections that were potentially from within the monument (Moe, personal communication).

These earlier collection efforts documented two rare and two nonnative plant species. The two rare taxa, *Lupinus duranii* and *Hulsea brevifolia* are both listed in the Inventory of Rare and Endangered Plants of California (CNPS 2001), and the nonnative taxa documented were *Taraxacum officinale* and *Phleum pratense*. The current status of these taxa in Devils Postpile National Monument is discussed below.

DESCRIPTION OF THE STUDY AREA

Geology

Devils Postpile National Monument sits at an average elevation of 2,280 m (7600 feet) just below the Sierra Crest on the west slope of the Sierra Nevada. The postpile formation for which the monument is named is only one of the many manifestations of the widespread volcanic activity in this part of the Sierra Nevada. The basalt columns of the postpile were formed under a unique set of conditions: ample volume of magma, slow cooling time, and homogeneity of mineral composition (Huber and Eckhardt 1985). Glaciers that flowed down the valley of the Middle Fork San Joaquin River eroded most of the lava flows of the area and exposed the rocks that we see in the monument today. Other major geologic units in the monument include andesite of Mammoth Pass, rhyodacite of Rainbow Falls, and basalt of the Buttresses (Huber and Eckhardt 1985, Figure 3). The soils are mostly sandy with a thin surface-layer of loose pumice, but in the meadows there is some development of organic material.

Climate

The climate of Devils Postpile is a reflection of its proximity to the Sierra Crest and the Mediterranean-type weather patterns of California. Characterized by cold, wet winters and warm, dry summers, the majority of precipitation at the monument falls in the form of snow during the winter months, and summer temperatures are moderate.

Vegetation

Near the headwaters of the Middle Fork San Joaquin River, this high-Sierran river corridor supports rich forests and verdant meadows. Species characteristic of both the wetter western and drier eastern slopes of the Sierra Nevada are present in Devils Postpile because of its proximity to the Sierra Crest. Though small in size, the monument is diverse enough in its topography and geology to support a number of different plant communities.

Forests and Chaparral. Lodgepole pine is prevalent along the river's edge, giving way to coniferous forests including mixes of Jeffrey pine, white pine, red fir, white fir and an occasional western juniper and white-bark pine at the higher, drier elevations. The understory of these coniferous forests is relatively sparse on mid- to high-slopes, with *Eriogonum nudum, Achnatherum occidentalis, Carex rossii, Hieracium albiflorum, Monardella odoratissima* ssp. *pallida, Stephanomeria tenuifolia, Phacelia hydrophylloides*, and *Gayophytum* spp. being the most abundant herbs. Dry, sunny forest openings support small patches of chaparral consisting of various mixes of *Ceanothus cordulatus, Arctostaphylos patula, A. nevadensis, Ribes roezlii* var. *roezlii, R. cereum* var. *cereum, Prunus emarginata*, and *Quercus vacciniifolia*. Sunny openings also support

numerous large stands of *Pteridium aquilinum* var. *pubescens* in both moist and dry drainage bottoms. Only one aspen stand of significant size is found in the monument.

Meadows. On low-slopes and in drainage bottoms, accumulated moisture allows montane meadow vegetation to flourish. The lower these meadows are topographically, the longer the moisture remains and the richer the species diversity. Common species found in the meadows include *Dodecatheon jeffreyi, Horkelia fusca* ssp. *parviflora, Lilium kelleyanum, Smilacina racemosa, S. stellata, Equisetum arvense, Lupinus polyphyllus* var. *burkei, Epilobium* spp., *Spiranthes leucostachys, Mimulus* spp., *Trifolium* spp., and *Carex* spp.

Seeps and Ponds. Seep vegetation is relatively common and contributes significantly to the diversity of the flora of DEPO. Characterized by high amounts of soil moisture, the seeps support micro-communities including *Mimulus* spp., *Trifolium monanthum, Lithophragma glabrum, Deschampsia danthonioides, Hypericum anagalloides, Allophyllum integrifolium, Phlox gracilis,* and *Polygonum douglasii*. Shallow ponds are not uncommon in the monument and they further increase the habitat diversity with their unique aquatic systems within the otherwise dry surroundings.

Riparian. *Alnus incana* ssp. *tenuifolia, Cornus sericea* ssp. *sericea,* and *Salix* spp. are the dominant woody species along the banks of the Middle Fork San Joaquin River. Black cottonwoods (*Populus balsamifera* ssp. *trichocarpa*) occasionally dot the banks, however they are not a major component of the flora. *Epilobium angustifolium, Sphenosciadium capitellatum, Helenium bigelovii,* and *Arnica mollis* are commonly found along the banks of the river. Intermittent riparian habitats are common in the

monument and support species such as *Allium vallidum*, *Mimulus lewisii, M. guttatus, Zigadenus venosus,* and *Carex* spp.

Disturbance

During 2004 fire-history sampling (collection of partial sections from fire scarred trees that will be used to dendrochronologically date past fire events) was carried out in the monument. Preliminary results suggest moderate fire frequency over much but not all the monument. Mean fire return interval for three sites ranged from about 10 to 20 years (Caprio personal communication). Longer intervals between fires were indicated in the northwest corner of the monument where western hemlock and western white pine occur.

The Rainbow Fire was ignited by lightning on August 20, 1992 south of Devils Postpile in the Inyo National Forest. Strong winds moved the fire northward up the Middle Fork San Joaquin River from its point of origin near Pond Lily Lake. When the winds died down, the fire slowed and dropped to the forest, burning in-surface fuels and ground-cover vegetation. Approximately two-thirds of Devils Postpile's 319 ha were affected by the fire (Figure 4). In many areas fire crept along the forest floor, occasionally burning into trees. The southeast portion of the monument shows signs of high severity wind-driven fire with high tree mortality.

Most of the human activity and disturbance occurs near the eastern border of the monument, where visitation is concentrated around the postpile formation, Rainbow Falls, campgrounds, and the ranger station (Figure 2). Fishing is extremely popular in this part of the Sierra, and Soda Springs Meadow and the gravel bars nearest the ranger station are heavily used by fishermen. Meadow impacts resulting from "fishing trails" necessitated the posting of several "No Access to River" signs in these areas, however

they were often disregarded. Reds Meadow Resort, located a few miles to the southeast of the monument (Figure 1), often runs packhorses through the monument and disturbances from these excursions are mostly seen in the form of trail impacts. The western half of Devils Postpile, especially to the south, rarely sees any human visitors at all except those passing through on the King Creek Trail or the John Muir and Pacific Crest Trails (Figure 2).

METHODS

The primary objective of this survey was to document at least 90 percent of the vascular flora of Devils Postpile National Monument. To do this, representative specimens of all vascular plant taxa encountered within the 319 ha of the monument were collected. At each collection site UTM coordinates were recorded using a Garmin GPS 12 Personal Navigator™, and notes were taken on the aspect, percent slope, slope position, substrate, surface material, elevation, and plant community associated with the site. When possible, all parts of the plant necessary for identification were collected and enough material for two full herbarium sheets was included. The field season ran from 18 Jun 2001 to 7 September 2001, with a total of 23 field collecting days. Relative abundance of each taxon was estimated at the end of the field season when familiarity with the flora was highest.

Given the small size of the monument it was possible to search the entire monument on foot. An estimated 30 percent of the surface area was not closely scrutinized simply because it was not feasible to look on the other side of every rock and knoll. Collections were made wherever a new taxon was encountered; however an effort was made to maximize the number of specimens collected at each site in order to increase

efficiency. Table 1 shows that the majority of specimens were collected in June and July. On average, 10 specimens per site were collected in June, 3.5 in July, 1 in August, and 2 in September. Figure 5 shows the location of collection sites, which applies to an area approximately 25m^2. Though the large gaps without collection sites were searched, no collections were necessary in these areas. The only area not searched was near the road in the northeast corner of the monument. An informal scan of this area from the road indicated that there were no unusual habitats or nonnative invasive threats. The highest concentration of collection sites was along the river, in riparian habitats and meadows.

Month Total Specimens Collected	Date	Number of Collection Sites	Number of Specimens Collected
June 271	18 June 2001	8	34
	20 June 2001	2	31
	22 June 2001	4	40
	23 June 2001	4	60
	24 June 2001	7	47
	25 June 2001	3	15
	26 June 2001	3	30
	27 June 2001	1	14
July 190	03 July 2001	6	41
	05 July 2001	3	6
	15 July 2001	5	19
	22 July 2001	3	17
	24 July 2001	2	2
	25 July 2001	7	33
	26 July 2001	4	11
	27 July 2001	6	18
	28 July 2001	6	24
	29 July 2001	5	11
	30 July 2001	4	8
August 6	06 August 2001	1	1
	07 August 2001	2	2
	18 August 2001	3	3
September 10	07 September 2001	5	10 (mostly conifers)

Table 1. Number of specimens collected for each day/month.

The second objective of this survey was to document the distribution and abundance of both rare and nonnative plant taxa occurring within the monument. A preliminary list of 43 "special-status" plants (rare plants) that were either known or expected to occur in the monument was used to inform directed searches for rare and or sensitive taxa (Jones and Stokes 2001). This list included two taxa that had previously been documented in the monument and an attempt was made to locate populations of these taxa, as well as any others that were on the list, based on their habitat requirements.

Extended habitat-specific searches were conducted for nonnative invasive species. Population size was estimated for all nonnative taxa encountered and those demonstrating an invasive nature were pulled out by the roots and left to decompose on site. On occasion, the plants were too big to be pulled and these were chopped down as close to ground level as possible. Seed heads that could potentially mature were either removed or destroyed depending on their level of maturity.

The Sequoia and Kings Canyon vegetation field crew visited Devils Postpile from July 25-30 and established 57 vegetation plots for the purpose of ground truthing the draft vegetation map of the monument. These plots were established according to standardized sampling protocols developed by the National Park Service vegetation mapping program (The Nature Conservancy 1994). During this period an attempt was made to visit as many of the different habitat types represented on the map as possible. The search strategy was modified during this period from broad searches over as much of the monument as possible, to directed searches of specific plant communities. The combination of these search strategies helped ensure a thorough coverage of the monument.

Hickman (1993), Munz (1965 and 1968), Botti (2001), and Cronquist et al. (1977) were the primary references used for identifications, and nomenclature follows Hickman (1993). 338 specimens were verified at the UC/Jepson Herbaria in Berkeley, California during the weeks of July 9-13 and September 10-14, and the remaining 139 specimens were subsequently verified at the Rocky Mountain Herbarium in Laramie, Wyoming. Dr. Allan Smith determined the ferns and Dr. Robert Dorn determined the willows; all other determinations were made by Melanie Arnett.

All vascular plant collection and distributional data compiled for this study are stored in an Access database (DEPO Flora.mdb), as are vegetation mapping plot data (DEPO Plotdata.mdb). Spatial data are stored in ArcView project files. All digital data are stored at Sequoia and Kings Canyon National Parks, where they are managed by the park plant ecologist.

RESULTS

The total number of vascular plant taxa now documented from Devils Postpile National Monument is 380, representing a 125 percent increase over previous studies (List 1). 507 specimens representing 343 taxa were collected in the course of this study. From these specimens, 935 vouchers were produced: one complete set was deposited in the Devils Postpile Herbarium, and duplicates, when available, were deposited at the Jepson and the Rocky Mountain herbaria (List 1). The 287 vouchers from previous work, and 467 from the present study, bring the total number of vouchers in the Devils Postpile Herbarium to 754. A floristic summary for the monument is shown in Table 2.

List 1: The Vascular Plant Checklist for Devils Postpile National Monument

The list is sorted first by division, then alphabetically by family, genus,

species, and infraspecific taxa. Abundance is given for each taxon (local = occurring occasionally in small populations, occasional = occurring occasionally as individuals, locally common = occurs occasionally in larger populations, locally abundant = occurs often in dense stands, uncommon = unlikely to be encountered and sometimes not present in appropriate habitats, and abundant = very likely to be encountered; nearly always found in appropriate habitats, sometimes forming dense stands), and the collection identification number is given for the herbarium where the specimens were deposited (DEPO = Devils Postpile Herbarium; JEPS = Jepson Herbarium; and RM = Rocky Mountain Herbarium), with a maximum of 3 depositions cited for any one herbarium. All collection numbers higher than 8000 are from collections made by Melanie Arnett with or without Sylvia Haultain, Linda Mutch, or Daniel Phipps McCoy. Collection numbers presented in the format 'DEPO.[plot number].[collection number]' represent vegetation mapping plot vouchers. Taxa that were not collected in this study are cited from collections made by the following collectors: KAH = K. Ann Hoffmann, SCM = Sandra C. Morey, JLM = Joseph L. Medeiros, JN = Jan Nachlinger; collection numbers were not supplied with the specimens of the latter two collectors. Taxa preceded by a * are nonnative, those by a ❖ are listed in the California Native Plant Society's Inventory of Rare and Endangered Plants of California (2001), those by a ^ are absent in Yosemite National Park (Botti 2001). Finally, three specimens that still need to be identified to species are preceded by a +; two of these (*Chenopodium* sp. and *Mimulus* sp.) represent new taxa to the checklist, whereas one (*Arabis* sp.) may or may not already be documented. These 3 specimens will be sent to specialists for determination.

LYCOPHYTA

Selaginellaceae

Selaginella watsonii L. Underw. Local. DEPO: DEPO.0040.08; JEPS: DEPO.0061.01.

SPHENOPHYTA

Equisetaceae

Equisetum arvense L. Locally common. DEPO: 8182; JEPS: 8182.
Equisetum laevigatum A. Braun. Locally common. DEPO: 8348; JEPS: 8348; RM: 8348.

PTEROPHYTA

Dennstaedtiaceae

Pteridium aquilinum (L.) Kuhn var. *pubescens* Underwood. Locally common. DEPO: 8400; JEPS: 8400.

Dryopteridaceae

Athyrium filix-femina (L.) Roth var. *cyclosorum* Rupr. Occasional. DEPO: 8343; JEPS: 8343; RM: 8343.
Cystopteris fragilis (L.) Bernh. Occasional. DEPO: 8178, 8225; JEPS: 8225; RM: 8178.

Pteridaceae

Aspidotis densa (Brackenr.) Lellinger. Uncommon. DEPO: 8259; JEPS: 8259; RM: 8259.
Cryptogramma acrostichoides R.Br. in Richards. Occasional. DEPO: 8214; JEPS: 8214.
Pellaea breweri D. Eaton. Uncommon. DEPO: 8391; JEPS: 8391; RM: 8391.

CONIFEROPHYTA

Cupressaceae

Juniperus occidentalis Hook. var. *australis* (Vasek) A. Holmgren & N. Holmgren. Occasional. DEPO: 8478; JEPS: 8478.

Pinaceae

Abies concolor (Gordon & Glend.) Lindley. Abundant. DEPO: 8485; JEPS: 8485.
Abies magnifica Andr. Murray var. *magnifica*. Abundant. DEPO: 8481; JEPS: 8481.
Pinus albicaulis Engelm. Uncommon. DEPO: 8385; JEPS: 8385.
Pinus contorta Loudon ssp. *murrayana* (Grev. & Balf.) Critchf. Locally abundant. DEPO: 8480; JEPS: 8480.
Pinus jeffreyi Grev. & Balf. Common. DEPO: 8486; JEPS: 8486.

Pinus monticola Douglas. Local. DEPO: 8479; JEPS: 8479.
Tsuga mertensiana (Bong.) Carriere. Uncommon. DEPO: 8367; JEPS: 8367.

ANTHOPHYTA

Liliopsida

Cyperaceae

Carex abrupta Mackenzie. Locally common. DEPO: 8342, 8356, 8466; JEPS: 8342, 8356, 8466; RM: 8356.
Carex athrostachya Olney. Locally common. DEPO: 8345, 8369, 8370; JEPS: 8345, 8370, 8384; RM: 8369, 8371.
Carex heteroneura W. Boott var. *epapillosa* (Mackenzie) F. Herm. Locally common. DEPO: 8372; JEPS: 8372; RM: 8372.
Carex heteroneura W. Boott var. *heteroneura*. Locally common. DEPO: 8019, 8108; JEPS: 8019, 8108; RM: 8108.
Carex hoodii Boott. Locally common. DEPO: 8216, 8299; JEPS: 8299; RM: 8216.
Carex integra Mackenzie. Uncommon. DEPO: 8121, 8300; JEPS: 8121, 8300.
Carex jonesii L. Bailey. Uncommon. DEPO: 8144; JEPS: 8144; RM: 8144.
Carex lanuginosa Michaux. Locally common. DEPO: 8175, 8357, 8464; JEPS: 8357, 8464; RM: 8175, 8357.
Carex lenticularis Michaux var. *impressa* (L. Bailey) L. Standley. Locally common. DEPO: 8222.
Carex lenticularis Michaux var. *lipocarpa* (Holm.) L. Standley. Locally common. DEPO: 8036, 8297, 8420; JEPS: 8298, 8420; RM: 8297.
Carex leporinella Mackenzie. Local. DEPO: DEPO.0039.14; JEPS: DEPO.0004.07.
Carex mariposana L. Bailey. Local. DEPO: 8107; JEPS: 8107; RM: 8107.
Carex microptera Mackenzie. Local. DEPO: DEPO.0019.21; JEPS: DEPO.0044.08.
Carex multicostata Mackenzie. Common. DEPO: 8395, 8398, 8471; JEPS: 8395, 8398, 8471; RM: 8395, 8398.
Carex nebrascensis Dewey. Locally common. DEPO: 8016, 8467; JEPS: 8016, 8467; RM: 8467.
Carex nervina L. Bailey. Locally common. DEPO: 8038, 8206; JEPS: 8206.
Carex rossii Boott. Locally abundant. DEPO: 8021, 8208; JEPS: 8021, 8208; RM: 8021.
Carex subfusca W. Boott. Common. DEPO: 8205, 8389; JEPS: 8205, 8389; RM: 8389.
Carex utriculata Boott. Locally abundant. DEPO: 8155; JEPS: 8155.
Carex vesicaria L. Uncommon. DEPO: DEPO.0024.02.
Carex vesicaria L. var. *vesicaria*. Locally abundant. DEPO: 8346, 8388; JEPS: 8346; RM: 8388.
Carex whitneyi Olney. Uncommon. DEPO: DEPO.0038.13.
^*Cyperus squarrosus* L. Uncommon. DEPO: 8257; JEPS: 8257.
Eleocharis acicularis (L.) Roemer & Shultes var. *bella* Piper. Locally common. DEPO: 8380; JEPS: 8380.
Eleocharis macrostachya Britton. Locally common. DEPO: 8387; JEPS: 8387; RM: 8387.

Scirpus microcarpus C. Presl. Locally common. DEPO: 8156, 8462; JEPS: 8156, 8462.

Iridaceae

Sisyrinchium idahoense E. Bickn. var. *occidentale* (E. Bickn.) D. Henderson. Uncommon. DEPO: SCM 208.

Juncaceae

Juncus balticus Willd. Locally common. DEPO: 8334; JEPS: 8334.
Juncus drummondii E. Meyer. Locally common. DEPO: 8046; JEPS: 8046; RM: 8046.
Juncus nevadensis S. Watson. Common. DEPO: 8039, 8074, 8383; JEPS: 8041, 8293, 8383; RM: 8075, 8362.
Juncus orthophyllus Cov. Uncommon. DEPO: DEPO.0004.08.
Juncus parryi Engelm. Locally common. DEPO: DEPO.0030.02; DEPO.0061.03.
Juncus saximontanus Nelson. Uncommon. DEPO: 8361.
Luzula comosa E. Meyer. Uncommon. DEPO: 8145; JEPS: 8145; RM: 8145.
Luzula parviflora (Ehrh.) Desv. Locally common. DEPO: 8073, 8291; JEPS: 8073; RM: 8291.

Juncaginaceae

Triglochin maritima L. Uncommon. DEPO: 8146.

Liliaceae

Allium validum S. Watson. Locally common. DEPO: 8315; JEPS: 8315.
Brodiaea elegans Hoover ssp. *elegans*. Uncommon. DEPO: 8412.
Calochortus leichtlinii Hook. f. Occasional. DEPO: 8262; JEPS: 8262.
Fritillaria atropurpurea Nutt.. Uncommon. DEPO: 8025; JEPS: 8025.
^*Lilium kelleyanum* Lemmon. Locally common. DEPO: 8201; JEPS: 8201.
Smilacina racemosa (L.) Link. Locally common. DEPO: 8180, 8308; JEPS: 8180; RM: 8308.
Smilacina stellata (L.) Desf. Local. DEPO: 8153, 8307; JEPS: 8153; RM: 8307.
Triteleia ixioides (S. Watson) E. Greene ssp. *anilina* (E. Greene) L. Lenz. Occasional. DEPO: 8219, 8232; JEPS: 8232.
Veratrum californicum Durand var. *californicum*. Local. DEPO: SCM 209.
Zigadenus venenosus S. Watson var. *venenosus*. Local. DEPO: 8028, 8316; JEPS: 8316.

Orchidaceae

Corallorhiza maculata Raf. Uncommon. DEPO: 8366; JEPS: 8366.
Platanthera leucostachys Lindley. Locally common. DEPO: 8123; JEPS: 8123.
Spiranthes romanzoffiana Cham. Local. DEPO: 8459; JEPS: 8459.

Poaceae

Achnatherum lemmonii (Vasey) Barkworth. Local. DEPO: DEPO.0006.09; JEPS: DEPO.003.12
Achnatherum occidentale (Thurber) Barkworth ssp. *californicum* (Merr. & Burtt Davy) Barkworth. Occasional. DEPO: 8393B; JEPS: 8393B.
Achnatherum occidentale (Thurber) Barkworth ssp. *occidentalis*. Abundant. DEPO: 8194, 8323, 8352; JEPS: 8352; RM: 8323.
Achnatherum occidentale (Thurber) Barkworth ssp. *pubescens* (Vasey) Barkworth. Local. DEPO: DEPO.0060.03.
Agrostis exarata Trin. Uncommon. DEPO: 8363; JEPS: 8363.
Agrostis idahoensis Nash. Common. DEPO: 8245; JEPS: 8245.
Agrostis scabra Willd. Common. DEPO: 8310, 8364; JEPS: 8310; RM: 8364.
Agrostis thurberiana A. Hitchc. Uncommon. DEPO: 8365; JEPS: 8365.
Agrostis variabilis Rydb. Local. DEPO: DEPO.0014.05; JEPS: DEPO.0009.37.
Bromus ciliatus L. Occasional. DEPO: SCM 220.
Bromus laevipes Shear. Locally common. DEPO: 8106, 8319, 8351; JEPS: 8319, 8351; RM: 8106, 8351.
Bromus suksdorfii Vasey. Local. DEPO: 8172; JEPS: 8172.
Calamagrostis canadensis (Michaux) Beauv. Locally common. DEPO: 8331; JEPS: 8331; RM: 8331.
Calamagrostis stricta (Timm) Koeler ssp. *inexpansa* (A. Gray) C.W. Greene. Locally common. DEPO: 8435; JEPS: 8435; RM: 8435.
^❖*Cinna bolanderi* Scribner. Uncommon. DEPO: 8425; JEPS: 8425.
Danthonia intermedia Vasey. Uncommon. DEPO: DEPO.0003.07.
Deschampsia cespitosa (L.) Beauv. ssp. *cespitosa*. Local. DEPO: SCM 216.
Deschampsia danthonioides (Trin.) Benth. Locally common. DEPO: 8228, 8255; JEPS: 8228; RM: 8255.
Deschampsia elongata (Hook.) Benth. Local. DEPO: 8303; JEPS: 8303.
^*Distichlis spicata* (L.) E. Greene. Uncommon. DEPO: 8332; JEPS: 8332.
Elymus elymoides (Raf.) Swezey ssp. *californicus* (J. G. Smith) Barkworth. Common. DEPO: 8393A.
^*Elymus elymoides* (Raf.) Swezey ssp. *elymoides*. Common. DEPO: 8071; JEPS: 8071; RM: 8071.
Elymus glaucus Buckley ssp. *glaucus*. Locally abundant. DEPO: 8344, 8374; JEPS: 8374; RM: 8344.
Elymus trachycaulus (Link.) Shinn. ssp. *trachycaulus*. Local. DEPO: 8333, 8455; JEPS: 8333.
Glyceria elata (Lam.) A. Hitchc. Locally common. DEPO: 8072, 8173, 8457; JEPS: 8072, 8173, 8457; RM: 8072, 8173.
Glyceria striata (Lam.) A. Hitchc. Uncommon. DEPO: 8465.
^*Hordeum brachyantherum* Nevski ssp. *californicum* (Covas & Stebb.) V. Bothmer, N. Jacobson, & O. Seb. Abundant. DEPO: 8170; JEPS: 8170.
Leymus triticoides (Buckley) Pilger. Uncommon. DEPO: JLM.
Melica bulbosa Geyer. Uncommon. DEPO: DEPO.0041.14.
Melica harfordii Bolander. Uncommon. DEPO: SCM 219.
Melica stricta Bolander. Occasional. DEPO: 8210; JEPS: 8210.

Muhlenbergia andina (Nutt.) A. Hitchc. Uncommon. DEPO: 8406; JEPS: 8406.
Muhlenbergia filiformis (Thurber) Rydb. Locally abundant. DEPO: 8256, 8277, 8301; JEPS: 8256; RM: 8277.
Muhlenbergia richardsonis (Trin.) Rydb. Common. DEPO: 8209, 8276; JEPS: 8209; RM: 8276.
Phleum alpinum L. Common. DEPO: 8124; JEPS: 8124.
**Phleum pratense* L. Uncommon. DEPO: SCM 234. Native to Eurasia.
**Poa annua* L. Occasional. DEPO: 8302; JEPS: 8302. Native to Europe.
Poa bolanderi Vasey. Uncommon. DEPO: 8050; JEPS: 8050; RM: 8050.
**Poa pratensis* L. ssp. *pratensis*. Uncommon. DEPO: 8275, 8278; JEPS: 8275; RM: 8278. Native to Europe.
Poa secunda Presl ssp. *secunda*. Common. DEPO: 8086, 8258, 8394; JEPS: 8086, 8394; RM: 8086.
Poa wheeleri Vasey. Uncommon. DEPO: 8087, 8105, 8184; JEPS: 8087, 8184; RM: 8184.
Scribneria bolanderi (Thurber) Hackel. Uncommon. DEPO: 8045; JEPS: 8045.
Trisetum canescens Buckley. Common. DEPO: 8314, 8373; JEPS: 8373; RM: 8314.
Trisetum spicatum (L.) Richter. Locally abundant. DEPO: 8183; JEPS: 8183.

Potamogetonaceae

Potamogeton gramineus L. Local. DEPO: 8386; JEPS: 8386; RM: 8386.

Typhaceae

^*Sparganium emersum* Rehmann ssp. *emersum*. Uncommon. DEPO: 8402; JEPS: 8402.
Typha latifolia L. Uncommon. DEPO: 8390.

Magnoliopsida

Apiaceae

Cymopterus terebinthinus (Hook.) M.E. Jones var. *californicus* (J. Coulter & Rose) Jepson. Local. DEPO: 8473; JEPS: 8473.
Heracleum lanatum Michaux. Local. DEPO: 8433; JEPS: 8433.
Ligusticum grayi J. Coulter & Rose. Local. DEPO: 8476; JEPS: 8476.
Lomatium torreyi (J. Coulter & Rose) J. Coulter & Rose. Uncommon. DEPO: 8397; JEPS: 8397.
Osmorhiza chilensis Hook. & Arn. Local. DEPO: 8165; JEPS: 8064.
Osmorhiza occidentalis (Nutt.) Torrey. Uncommon. DEPO: 8198; JEPS: 8198.
Oxypolis occidentalis J. Coulter & Rose. Uncommon. DEPO: 8461; JEPS: 8461.
Perideridia parishii (J. Coulter & Rose) Nelson & J.F. Macbr. ssp. *latifolia* (A. Gray) Chuang & Constance. Common. DEPO: 8405; JEPS: 8405.
^*Sium suave* Walter. Uncommon. DEPO: 8428; JEPS: 8428.
Sphenosciadium capitellatum A. Gray. Occasional. DEPO: 8223; JEPS: 8223.

Apocynaceae

Apocynum androsaemifolium L. Common. DEPO: 8083; JEPS: 8083.

Asteraceae

Achillea millefolium L. Common. DEPO: 8217; JEPS: 8217.
Ageratina occidentalis (Hook.) R. King & H. Robinson. Local. DEPO: JN; JLM.
Agoseris elata (Nutt.) E. Greene. Local. DEPO: 8454.
Agoseris glauca (Pursh) Raf. var. *monticola* (E. Greene) Q. Jones. Occasional. DEPO: 8399.
Agoseris retrorsa (Benth.) E. Greene. Uncommon. DEPO: 8081; JEPS: 8081.
Anaphalis margaritacea (L.) Benth. & Hook. Common. DEPO: 8336; JEPS: 8336.
Antennaria corymbosa E. Nelson. Uncommon. DEPO: 8272; JEPS: 8272; RM: 8272.
Antennaria rosea E. Greene ssp. *confinis* (E. Greene) R. Bayer. Common. DEPO: 8330; JEPS: 8392.
Arnica chamissonis Less. ssp. *foliosa* (Nutt.) Maguire. Locally common. DEPO: 8437; JEPS: 8437; RM: 8437.
Arnica mollis Hook. Locally common. DEPO: 8234, 8324; JEPS: 8324.
Artemisia douglasiana Besser. Locally abundant. DEPO: 8434; JEPS: 8434.
Artemisia ludoviciana Nutt. ssp. *incompta* (Nutt.) Keck. Locally abundant. DEPO: JLM.
Artemisia tridentata Nutt. ssp. *vaseyana* (Rydb.) Beetle. Uncommon. DEPO: 8483; JEPS: 8483.
Aster breweri (A. Gray) Semple. Occasional. DEPO: 8189; JEPS: 8189.
^*Aster eatonii* (A. Gray) Howell. Uncommon. DEPO: 8475; JEPS: 8475; RM: 8475.
Aster foliaceus Lindley var. *parryi* (Eaton) A. Gray. Uncommon. DEPO: 8426, 8440; JEPS: 8426, 8440; RM: 8426.
Aster integrifolius Nutt. Occasional. DEPO: SCM 232.
Aster occidentalis (Nutt.) Torrey & A. Gray var. *occidentalis*. Occasional. DEPO: 8453; JEPS: 8453.
Chaenactis alpigena Sharsm. Uncommon. DEPO: JLM.
Chaenactis douglasii (Hook.) Hook. & Arn. var. *douglasii*. Locally abundant. DEPO: 8114; JEPS: 8080.
Chrysothamnus nauseosus (Pall.) Britton ssp. *albicaulis* (Nutt.) Hall & Clem. Occasional. DEPO: 8414; JEPS: 8414; RM: 8414.
Chrysothamnus parryi (A. Gray) E. Greene ssp. *monocephalus* (Nelson & Kenn.) H.M. Hall & Clements. Uncommon. DEPO: 8396.
Cirsium andersonii (A. Gray) Jepson. Local. DEPO: 8077; JEPS: 8077.
Cirsium scariosum Nutt. Local. DEPO: 8274; JEPS: 8274; RM: 8274.
**Cirsium vulgare* (Savi) Ten. Locally common. DEPO: 8423.
Ericameria bloomeri (A. Gray) J.F. Macbr. Occasional. DEPO: SCM 244; JLM.
Erigeron breweri A. Gray var. *breweri*. Local. DEPO: 8079, 8411; JEPS: 8079, 8411; RM: 8411.
Erigeron coulteri Porter. Occasional. DEPO: 8424; JEPS: 8424.
Erigeron elmeri (E. Greene) E. Greene. Occasional. DEPO: 8215.

Erigeron peregrinus (Pursh) E. Greene var. *callianthemus* (E. Greene) Cronq. Local. DEPO: 8286, 8448; JEPS: 8218, 8448; RM: 8218.
Erigeron peregrinus (Pursh) E. Greene var. *hirsutus* Cronq. Local. DEPO: 8193, 8313; JEPS: 8193; RM: 8313.
Eriophyllum lanatum (Pursh) James Forbes var. *integrifolium* (Hook.) F.J. Smiley. Uncommon. DEPO: 8350; JEPS: 8350.
Gnaphalium californicum DC. Occasional. DEPO: 8474; JEPS: 8474.
Gnaphalium canescens DC. ssp. *thermale* (E. Nelson) Stebb. & Keil. Common. DEPO: 8409, 8482; JEPS: 8409, 8482; RM: 8482.
Gnaphalium palustre Nutt. Locally common. DEPO: 8368, 8419; JEPS: 8419.
Helenium bigelovii Gray. Occasional. DEPO: 8220, 8431; JEPS: 8431.
Hieracium albiflorum Hook. Abundant. DEPO: 8236; JEPS: 8236.
Hieracium horridum Fries. Common. DEPO: 8018.
❖*Hulsea brevifolia* A. Gray. Common. DEPO: 8110, 8192, 8401; JEPS: 8110; RM: 8192.
^*Hulsea vestita* A. Gray ssp. *vestita*. Uncommon. DEPO: KAH 184.
**Lactuca serriola* L. Local. DEPO: 8477; JEPS: 8477. Native to Europe.
Madia exigua (Smith) A. Gray. Local. DEPO: 8249; JEPS: 8249.
Microseris nutans (Hook.) Schultz-Bip. Local. DEPO: 8033, 8190, 8328; JEPS: 8033, 8328; RM: 8190.
Senecio canus Hook. Local. DEPO: SCM 114; JLM.
Senecio integerrimus Nutt. var. *exaltatus* (Nutt.) Cronq. Common. DEPO: 8191; JEPS: 8191.
Senecio scorzonella E. Greene. Uncommon. DEPO: 8271; JEPS: 8271.
Senecio triangularis Hook. Locally abundant. DEPO: 8068; JEPS: 8068.
Solidago canadensis L. ssp. *elongata* (Nutt.) Keck. Locally abundant. DEPO: 8337; JEPS: 8337.
Stephanomeria tenuifolia (Torrey) H.M. Hall. Abundant. DEPO: 8321; JEPS: 8321; RM: 8321.
**Taraxacum officinale* Wigg. Local. DEPO: 8154; JEPS: 8281; RM: 8287. Native to Europe.
**Tragopogon dubius* Scop. Uncommon. DEPO: 8089. Native to Europe.
Trimorpha lonchophylla (Hook.) G. Nelson. Uncommon. DEPO: 8438; JEPS: 8438.
Wyethia mollis A. Gray. Occasional. DEPO: 8078; JEPS: 8078.

Betulaceae

Alnus incana (L.) Moench ssp. *tenuifolia* (Nutt.) Breitung. Common. DEPO: 8076; JEPS: 8076.

Boraginaceae

Cryptantha affinis (A. Gray) E. Greene. Locally common. DEPO: 8095, 8410; JEPS: 8410; RM: 8410.
Cryptantha echinella E. Greene. Locally common. DEPO: 8318.
Cryptantha torreyana (A. Gray) E. Greene. Locally common. DEPO: SCM 186.
Hackelia micrantha (Eastw.) J. Gentry. Local. DEPO: 8104; JEPS: 8104.

Hackelia mundula (Jepson) Ferris. Occasional. DEPO: 8422; JEPS: 8053; RM: 8053.
Hackelia velutina (Piper) I.M. Johnston. Occasional. DEPO: SCM 128.
Plagiobothrys hispidulus (E. Greene) I.M. Johnston. Locally common. DEPO: 8042, 8097, 8469; JEPS: 8096, 8097; RM: 8238, 8381.
Plagiobothrys hispidus A. Gray. Uncommon. DEPO: 8317, 8322; JEPS: 8322.

Brassicaceae

+*Arabis* sp. Uncommon. DEPO: 8243; JEPS: 8243; RM: 8243.
Arabis holboellii Hornem. var. *pinetorum* (Tidestrom) Rollins. Uncommon. DEPO: 8112, 8375; JEPS: 8112, 8375; RM: 8375.
Arabis holboellii Hornem. var. *retrofracta* (Graham) Rydb. Common. DEPO: 8069, 8111.
Arabis platysperma A. Gray var. *howellii* (S. Watson) Jepson. Common. DEPO: 8015; JEPS: 8015.
Arabis platysperma A. Gray var. *platysperma.*Local. DEPO: DEPO.0005.11; JEPS: DEPO.0025.03.
Arabis rectissima E. Greene var. *rectissima*. Common. DEPO: KAH 136; SCM 130.
Arabis repanda S. Watson var. *repanda*. Common. DEPO: 8035, 8047; JEPS: 8035, 8047.
Arabis xdivaricarpa Nelson. Common. DEPO: 8020, 8295; JEPS: 8295.
Barbarea orthoceras Ledeb. Local. DEPO: 8231, 8325; JEPS: 8231, 8325; RM: 8231.
Cardamine breweri S. Watson var. *breweri*. Uncommon. DEPO: 8432; JEPS: 8432.
^*Descurainia incana* (Fischer & C. Meyer) Dorn. Uncommon. DEPO: 8150, 8266; JEPS: 8266; RM: 8150.
Draba albertina E. Greene. Local. DEPO: 8125.
Erysimum capitatum (Douglas) E. Greene ssp. *perenne* (Cov.) R.A. Price. Common. DEPO: 8113; JEPS: 8113.
Lepidium densiflorum Schrader var. *macrocarpum* G. Mulligan. Uncommon. DEPO: 8484.
Phoenicaulis cheiranthoides Torrey & A. Gray. Uncommon. DEPO: 8472; JEPS: 8472.
Rorippa curvipes E. Greene var. *curvipes*. Uncommon. DEPO: DEPO.0036.12.
Rorippa curvisiliqua (Hook.) Britton. Local. DEPO: 8279, 8382; JEPS: 8279.
Rorippa nasturtium-aquaticum (L.) Hayek. Locally common. DEPO: 8358; JEPS: 8358.
Streptanthus tortuosus Kellogg var. *orbiculatus* (E. Greene) H.M. Hall. Common. DEPO: 8048; JEPS: 8048.

Caprifoliaceae

Lonicera conjugialis Kellogg. Common. DEPO: 8013, 8305; JEPS: 8013; RM: 8305.
Lonicera involucrata (Richards.) Banks var. *involucrata*. Local. DEPO: 8304; JEPS: 8304.
Sambucus mexicana C. Presl. Occasional. DEPO: JLM.
Symphoricarpos mollis Nutt. Uncommon. DEPO: 8450; JEPS: 8450.
Symphoricarpos rotundifolius A. Gray var. *rotundifolius*. Occasional. DEPO: 8177; JEPS: 8177.

Caryophyllaceae

Sagina saginoides (L.) Karsten. Locally common. DEPO: 8132; JEPS: 8132.
Silene menziesii Hook. Uncommon. DEPO: DEPO.0018.06.
**Spergularia rubra* (L.) J.S. Presl & C. Presl. Occasional. DEPO: 8273; JEPS: 8273. Native to Europe.
Stellaria longipes Goldie var. *longipes*. Local. DEPO: 8137, 8442; JEPS: 8137.
Stellaria umbellata Karelin & Kir. Local. DEPO: 8167; JEPS: 8167; RM: 8151.

Chenopodiaceae

+Chenopdium sp. Local. DEPO: 8468; JEPS: 8468.

Cornaceae

Cornus sericea L. ssp. *sericea*. Locally common. DEPO: 8188; JEPS: 8188.

Crassulaceae

Sedum obtusatum A. Gray ssp. *obtusatum*. Uncommon. DEPO: 8329; JEPS: 8329.

Ericaceae

Arctostaphylos nevadensis A. Gray. Uncommon. DEPO: 8055; JEPS: 8055.
Arctostaphylos patula E. Greene. Locally common. DEPO: 8091; JEPS: 8091; RM: 8091.
Ledum glandulosum Nutt. Uncommon. DEPO: 8312; JEPS: 8312.
Pterospora andromedea Nutt. Occasional. DEPO: 8403.
Pyrola picta Smith. Occasional. DEPO: 8237; JEPS: 8237.
Sarcodes sanguinea Torrey. Occasional. DEPO: 8012; JEPS: 8012.

Fabaceae

Lotus crassifolius (Benth.) E. Greene var. *crassifolius*. Locally common. DEPO: 8417; JEPS: 8417.
Lotus oblongifolius (Benth.) E. Greene var. *oblongifolius*. Uncommon. DEPO: 8427; JEPS: 8427.
Lotus purshianus (Benth.) Clements & E.G. Clements var. *purshianus*. Locally common. DEPO: 8227, 8449; JEPS: 8227.
Lupinus albicaulis Hook. Locally common. DEPO: 8197, 8452; JEPS: 8197; RM: 8452.
Lupinus latifolius J.G. Agardh var. *columbianus* (A. A. Heller) C.P. Smith. Locally common. DEPO: 8102; JEPS: 8102.
Lupinus lepidus Douglas var. *sellulus* (Kellogg) Barneby. Locally common. DEPO: 8117; JEPS: 8117.

Lupinus polyphyllus Lindley var. *burkei* (S. Watson) C. Hitchc. Common. DEPO: 8070, 8162, 8290; JEPS: 8070, 8270, 8290; RM: 8070, 8162.
Trifolium cyathiferum Lindley. Locally common. DEPO: 8246; JEPS: 8246.
Trifolium longipes Nutt. var. *nevadense* Jepson. Locally common. DEPO: 8166; JEPS: 8166.
Trifolium monanthum A. Gray var. *monanthum*. Locally common. DEPO: 8093, 8131; JEPS: 8093; RM: 8093.
Trifolium wormskioldii Lehm. Local. DEPO: 8436; JEPS: 8436.

Fagaceae

Chrysolepis sempervirens (Kellogg) Hjelmq. Uncommon. DEPO: 8463; JEPS: 8463; RM: 8463.
Quercus vacciniifolia Kellogg. Locally common. DEPO: 8487; JEPS: 8487.

Gentianaceae

Gentianopsis holopetala (A. Gray) Iltis. Uncommon. DEPO: KAH 200; JLM.
Gentianopsis simplex (A. Gray) Iltis. Uncommon. DEPO: 8460; JEPS: 8460.
Swertia radiata (Kellogg) Kuntze. Uncommon. DEPO: 8429; JEPS: 8429.

Geraniaceae

Geranium richardsonii Fischer & Trautv. Local. DEPO: 8161; JEPS: 8161.

Grossulariaceae

Ribes cereum Douglas var. *cereum*. Common. DEPO: 8054, 8199; JEPS: 8054, 8199.
Ribes inerme Rydb. var. *inerme*. Common. DEPO: 8339; JEPS: 8339.
Ribes nevadense Kellogg. Occasional. DEPO: 8186, 8341; JEPS: 8341; RM: 8186.
Ribes roezlii Regel var. *roezlii*. Common. DEPO: 8065; JEPS: 8065.
Ribes viscosissimum Pursh. Occasional. DEPO: DEPO.0026.17; JEPS: DEPO.0023.08.

Hydrophyllaceae

Hesperochiron pumilus (Griseb.) Porter. Uncommon. DEPO: SCM 109.
Nemophila spatulata Cov. Local. DEPO: 8129; JEPS: 8129.
Phacelia eisenii Brandegee. Uncommon. DEPO: 8233; JEPS: 8233.
Phacelia hastata Lehm. ssp. *compacta* (Brand) Heckard. Common. DEPO: 8067; JEPS: 8067.
Phacelia hydrophylloides A. Gray. Uncommon. DEPO: 8306; JEPS: 8306.
Phacelia mutabilis E. Greene. Occasional. DEPO: 8051; JEPS: 8051.

Hypericaceae

Hypericum anagalloides Cham. & Schldl. Locally common. DEPO: 8130; JEPS: 8327; RM: 8327.
Hypericum formosum Kunth var. *scouleri* (Hook.) J. Coulter. Uncommon. DEPO: JLM.

Lamiaceae

Agastache urticifolia (Benth.) Kuntze. Occasional. DEPO: 8263, 8289; JEPS: 8263, 8289.
Monardella odoratissima Benth. ssp. *pallida* (A.A. Heller) Epling. Common. DEPO: 8195; JEPS: 8195.
Stachys albens A. Gray. Locally common. DEPO: 8359; JEPS: 8359.

Loasaceae

Mentzelia dispersa S. Watson. Common. DEPO: 8034; JEPS: 8090; RM: 8090.

Onagraceae

Circaea alpina L. ssp. *pacifica* (Asch. & Magnus) Raven. Locally common. DEPO: 8202; JEPS: 8202.
Epilobium anagallidifolium Lam. Local. DEPO: 8052; JEPS: 8052.
Epilobium angustifolium L. ssp. *circumvagum* Mosq. Locally common. DEPO: 8335; JEPS: 8335.
Epilobium brachycarpum C. Presl. Locally common. DEPO: 8211, 8415, 8446; JEPS: 8211, 8446; RM: 8211, 8415.
Epilobium canum (E. Greene) Raven ssp. *latifolium* (Hook.) Raven. Uncommon. DEPO: 8458; JEPS: 8458.
Epilobium ciliatum Raf. ssp. *ciliatum*. Locally common. DEPO: 8264; JEPS: 8379.
Epilobium ciliatum Raf. ssp. *glandulosum* (Lehm.) P. Hoch & Raven. Common. DEPO: 8062, 8360, 8447; JEPS: 8062, 8360, 8447; RM: 8360, 8447.
Epilobium glaberrimum Barbey ssp. *fastigiatum* (Nutt.) P. Hoch & Raven. Local. DEPO: 8311; JEPS: 8311.
Epilobium glaberrimum Barbey ssp. *glaberrimum*. Locally common. DEPO: 8265; JEPS: 8265.
Epilobium halleanum Hausskn. Locally common. DEPO: 8063, 8098, 8141; JEPS: 8101, 8378; RM: 8118, 8408.
Epilobium hornemannii Reichb. ssp. *hornemannii*. Uncommon. DEPO: SCM 191.
Epilobium lactiflorum Hausskn. Uncommon. DEPO: DEPO.0018.19.
Gayophytum decipiens Harlan Lewis & J. Szweykowski. Occasional. DEPO: 8115; JEPS: 8115; RM: 8115.
Gayophytum diffusum Torrey & A. Gray ssp. *parviflorum* Harlan Lewis & J. Szweykowski. Abundant. DEPO: 8099, 8142; JEPS: 8099.
^*Gayophytum heterozygum* Harlan Lewis & J. Szweykowski. Local. DEPO: 8353; JEPS: 8353; RM: 8354.

Gayophytum humile A.L. Juss. Common. DEPO: 8023, 8100, 8247; JEPS: 8100; RM: 8247.
Gayophytum racemosum Torrey & A. Gray. Common. DEPO: 8418; JEPS: 8418.

Orobanchaceae

Orobanche fasciculata Nutt. Uncommon. DEPO: 8320; JEPS: 8320.

Polemoniaceae

Allophyllum gilioides (Benth.) A.D. Grant & V. Grant ssp. *violaceum* (A.A. Heller) Day. Uncommon. DEPO: 8267; JEPS: 8267; RM: 8267.
Allophyllum integrifolium (Brand) A.D. Grant & V. Grant. Locally common. DEPO: 8253, 8404; JEPS: 8253, 8404; RM: 8253.
Collomia linearis Nutt. Locally abundant. DEPO: 8296; JEPS: 8140; RM: 8140.
Collomia tinctoria Kellogg. Common. DEPO: 8326; JEPS: 8326.
Gilia capillaris Kellogg. Uncommon. DEPO: 8044; JEPS: 8044.
Gilia leptalea (A. Gray) E. Greene. Local. DEPO: SCM 162; JLM.
Ipomopsis aggregata (Pursh) V. Grant ssp. *formosissima* (E. Greene) Wherry. Locally common. DEPO: 8451; JEPS: 8451.
Leptodactylon pungens (Torrey) Rydb. Common. DEPO: 8148; JEPS: 8148.
Linanthus ciliatus (Benth.) E. Greene. Common. DEPO: 8109; JEPS: 8109.
Phlox gracilis E. Greene. Occasional. DEPO: 8133; JEPS: 8254; RM: 8254.
Polemonium occidentale E. Greene. Uncommon. DEPO: 8430.

Polygonaceae

Eriogonum nudum Benth. var. *deductum* (E. Greene) Jepson. Abundant. DEPO: 8049; JEPS: 8049.
Eriogonum nudum Benth. var. *nudum*. Abundant. DEPO: KAH 163; SCM 153, 223.
Eriogonum spergulinum A. Gray var. *reddingianum* (M.E. Jones) J. Howell. Abundant. DEPO: 8014; JEPS: 8014.
Eriogonum umbellatum Torrey var. *furcosum* Rev. Uncommon. DEPO: 8349; JEPS: 8349; RM: 8349.
Eriogonum umbellatum Torrey var. *nevadense*. Uncommon. DEPO: KAH 171; SCM 245.
Eriogonum wrightii Benth. var. *subscaposum* S. Watson. Occasional. DEPO: 8413; JEPS: 8413; RM: 8413.
Oxyria digyna (L.) Hill. Uncommon. DEPO: 8181; JEPS: 8181.
Polygonum bistortoides Pursh. Locally common. DEPO: 8280; JEPS: 8280.
Polygonum douglasii E. Greene ssp. *douglasii*. Locally common. DEPO: 8251.
Polygonum douglasii E. Greene ssp. *johnstonii* (Munz) J. Hickman. Locally common. DEPO: 8143; JEPS: 8407; RM: 8252.
Polygonum polygaloides Meissner ssp. *kelloggii* (E. Greene) J. Hickman. Locally common. DEPO: 8282; JEPS: 8282.
^*Rumex salicifolius* J. A. Weinm. var. *salicifolius*. Local. DEPO: 8439; JEPS: 8439.

Rumex salicifolius J.A. Weinm. var. *triangulivalvis* (Danser) C. Hitchc. Occasional. DEPO: SCM 139; JLM.

Portulacaceae

Calyptridium monospermum E. Greene. Locally common. DEPO: 8221; JEPS: 8221; RM: 8221.
Calyptridium umbellatum (Torrey) E. Greene. Local. DEPO: KAH 160; SCM 108.
^*Claytonia rubra* (Howell) Tidestrom ssp. *rubra*. Uncommon. DEPO: 8224; JEPS: 8224.
Lewisia nevadensis (A. Gray) Robinson. Uncommon. DEPO: SCM 102, 140.
Lewisia triphylla (S. Watson) Robinson. Uncommon. DEPO: 8031; JEPS: 8031.
Montia chamissoi (Sprengel) E. Greene. Uncommon. DEPO: 8032, 8136, 8283; JEPS: 8136, 8283; RM: 8138.

Primulaceae

Dodecatheon jeffreyi Van Houtte. Locally abundant. DEPO: 8126; JEPS: 8126; RM: 8126.

Ranunculaceae

Aconitum columbianum Nutt. Locally common. DEPO: 8163; JEPS: 8168; RM: 8168.
Aquilegia formosa Fischer. Local. DEPO: 8160; JEPS: 8160.
Delphinium glaucum S. Watson. Locally common. DEPO: 8456; JEPS: 8456.
Delphinium gracilentum E. Greene. Occasional. DEPO: KAH 143; JLM.
Delphinium nuttallianum Walp. Common. DEPO: 8242; JEPS: 8242.
Delphinium polycladon Eastw. Uncommon. DEPO: 8204; JEPS: 8204.
Ranunculus alismifolius Benth. var. *alismellus* A. Gray. Locally common. DEPO: KAH 130.
Ranunculus cymbalaria Pursh var. *saximontanus* Fern. Local. DEPO: 8443; JEPS: 8443.
Thalictrum fendleri A. Gray var. *fendleri*. Common. DEPO: 8169; JEPS: 8169; RM: 8169.
Thalictrum sparsiflorum Fischer & C. Meyer. Local. DEPO: 8294; JEPS: 8294.

Rhamnaceae

Ceanothus cordulatus Kellogg. Locally common. DEPO: 8116; JEPS: 8116; RM: 8116.
Rhamnus rubra E. Greene. Uncommon. DEPO: 8235; JEPS: 8235.

Rosaceae

^*Amelanchier alnifolia* (Nutt.) Nutt. var. *semiintegrifolia* (Hook.) C. Hitchc. Occasional. DEPO: 8185; JEPS: 8185.
Amelanchier utahensis Koehne. Local. DEPO: DEPO.0060.10; JEPS: DEPO.0062.08.
Geum macrophyllum Willd. Local. DEPO: 8288; JEPS: 8288.
Holodiscus microphyllus Rydb. var. *microphyllus*. Common. DEPO: 8212; JEPS: 8212.

Horkelia fusca Lindley ssp. *parviflora* (Nutt.) Keck. Locally abundant. DEPO: 8120, 8355; JEPS: 8355; RM: 8120.
Ivesia santolinoides A. Gray. Local. DEPO: 8200; JEPS: 8200.
Potentilla diversifolia Lehm. var. *diversifolia*. Uncommon. DEPO: DEPO.0004.01.
Potentilla glandulosa Lindley ssp. *nevadensis* (S. Watson) Keck. Common. DEPO: 8103; JEPS: 8103.
Potentilla gracilis Hook. var. *fastigiata* (Nutt.) S. Watson. Locally common. DEPO: 8119, 8164; JEPS: 8164.
Prunus emarginata (Hook.) Walp. Common. DEPO: 8085, 8338, 8416; JEPS: 8085, 8416; RM: 8338.
Rosa woodsii Lindley var. *ultramontana* (S. Watson) Jepson. Uncommon. DEPO: 8444; JEPS: 8444.
Sorbus californica E. Greene. Local. DEPO: 8179; JEPS: 8179.
Spiraea densiflora Torrey & A. Gray. Occasional. DEPO: 8268; JEPS: 8268.

Rubiaceae

Galium aparine L. Common. DEPO: 8229; JEPS: 8229.
Galium bifolium S. Watson. Locally common. DEPO: 8244; JEPS: 8094; RM: 8094.
Galium trifidum L. var. *pusillum* A. Gray. Local. DEPO: 8441; JEPS: 8139.
Galium triflorum Michaux. Locally abundant. DEPO: 8030, 8066, 8284; JEPS: 8030, 8066, 8284; RM: 8066.
Kelloggia galioides Torrey. Common. DEPO: 8029; JEPS: 8029.

Salicaceae

Populus balsamifera L. ssp. *trichocarpa* (Torrey & A. Gray) Brayshaw. Occasional. DEPO: 8340; JEPS: 8340.
Populus tremuloides Michaux. Uncommon. DEPO: 8171; JEPS: 8171.
Salix jepsonii C. Schneider. Occasional. DEPO: 8040; JEPS: 8040.
Salix lemmonii Bebb. Common. DEPO: 8017, 8157; JEPS: 8017; RM: 8157.
Salix lucida Muhlenb. ssp. *lasiandra* (Benth.) E. Murray. Occasional. DEPO: 8037, 8122; JEPS: 8122.
Salix scouleriana Hook. Occasional. DEPO: 8056, 8421; JEPS: 8056, 8421; RM: 8421.

Saxifragaceae

Heuchera rubescens Torrey var. *alpicola* Jepson. Locally common. DEPO: SCM 204.
Heuchera rubescens Torrey var. *rydbergiana* C. Rosend, F.K. Butters, & Lakela. Common. DEPO: 8149; JEPS: 8149.
Lithophragma glabrum Nutt. Local. DEPO: 8022, 8248; JEPS: 8248.
Mitella breweri A. Gray. Uncommon. DEPO: 8470; JEPS: 8470.
Saxifraga nidifica E. Greene var. *nidifica*. Locally common. DEPO: 8024, 8027, 8226; JEPS: 8226; RM: 8027.
Saxifraga odontoloma Piper. Uncommon. DEPO: JLM.

Scrophulariaceae

Castilleja applegatei Fern. ssp. *pinetorum* (Fern.) Chuang & Heckard. Common. DEPO: 8152, 8187, 8207; JEPS: 8152.
Castilleja miniata Hook. ssp. *miniata*. Occasional. DEPO: 8285; JEPS: 8285.
Castilleja parviflora Bong. Local. DEPO: DEPO.0062.02; JEPS: DEPO.0044.20.
Castilleja tenuis (Heller) Chuang & Heckard. Local. DEPO: 8250; JEPS: 8250; RM: 8176.
Collinsia parviflora Lindley. Locally common. DEPO: 8127; JEPS: 8127.
Collinsia torreyi A. Gray var. *wrightii* (S. Watson) I.M. Johnston. Locally common. DEPO: 8057; JEPS: 8057.
+*Mimulus* sp. Infrequent. DEPO: 8260; JEPS: 8260.
Mimulus breweri (E. Greene) Cov. Locally common. DEPO: 8092; JEPS: 8239.
Mimulus guttatus DC. Common. DEPO: 8158, 8230, 8240; JEPS: 8240; RM: 8158.
❖*Mimulus laciniatus* A. Gray. Local. DEPO: 8026, 8309; JEPS: 8026; RM: 8309.
Mimulus leptaleus A. Gray. Local. DEPO: SCM 123; JLM.
Mimulus lewisii Pursh. Local. DEPO: 8059; JEPS: 8059.
Mimulus moschatus Lindley. Locally common. DEPO: 8061, 8241; JEPS: 8159; RM: 8241.
Mimulus pilosus (Benth.) S. Watson. Uncommon. DEPO: SCM & JLM 212.
Mimulus primuloides Benth. ssp. *primuloides*. Locally common. DEPO: 8128; JEPS: 8128.
Mimulus tilingii Regel. Locally common. DEPO: 8060; JEPS: 8060; RM: 8060.
Pedicularis attollens A. Gray. Uncommon. DEPO: KAH 195; SCM 170.
Pedicularis semibarbata A. Gray. Common. DEPO: 8084; JEPS: 8084.
^*Penstemon azureus* Benth. var. *azureus*. Local. DEPO: 8043, 8213; JEPS: 8043, 8213; RM: 8213.
^*Penstemon heterodoxus* A. Gray var. *cephalophorus* (E. Greene) N. Holmgren. Locally common. DEPO: 8203; JEPS: 8203.
Penstemon laetus A. Gray var. *laetus*. Occasional. DEPO: SCM 146, JLM.
Penstemon newberryi A. Gray var. *newberryi*. Common. DEPO: 8147; JEPS: 8147.
Penstemon rostriflorus A. Gray. Occasional. DEPO: 8082; JEPS: 8082.
Penstemon rydbergii Nelson var. *oreocharis* (E. Greene) N. Holmgren. Locally common. DEPO: 8269; JEPS: 8269.
Veronica americana (Raf.) Schwein. Locally common. DEPO: 8134; JEPS: 8134.
Veronica serpyllifolia L. ssp. *humifusa* (Dickson) Syme. Locally common. DEPO: 8058; JEPS: 8058; RM: 8135.
Veronica wormskjoldii Roemer & Shultes. Locally common. DEPO: KAH 132; JLM & JN.

Solanaceae

Solanum xanti A. Gray. Locally common. DEPO: 8088; JEPS: 8088; RM: 8088.

Urticaceae

Urtica dioica L. ssp. *holosericea* (Nutt.) Thorne. Local. DEPO: 8261; JEPS: 8261.

Valerianaceae

Valeriana californica A.A. Heller. Local. DEPO: 8196; JEPS: 8196.

Violaceae

Viola macloskeyi F. Lloyd. Occasional. DEPO: KAH 260.

Viscaceae

Arceuthobium americanum Engelm. Locally common. DEPO: 8347; JEPS: 8347.

Division Class	Families	Genera	Species		
			Native	Nonnative	Total
Lycophyta	**1**	**1**	1	**0**	**1**
Sphenophyta	**1**	**1**	**2**	**0**	**2**
Pterophyta	**3**	**6**	**6**	**0**	**6**
Coniferophyta	**2**	**4**	**8**	**0**	**8**
Anthophyta	**48**	**182**	**353 (+1?)**	**8 (+1?)**	**363**
Dicots	39	140	260 (+1?)	5 (+1?)	267
Monocots	9	41	93	3	96
Total	**54**	**191**	**370 (+1?)**	**8 (+1?)**	**380**

Table 2. Floristic summary of vascular plant taxa of Devils Postpile National Monument. Three collections are only identified to genus at present; two of these represent new taxa to the checklist and their expected placement in the categories are listed as (+1?).

We estimate that 90 percent or more of the vascular flora of Devils Postpile National Monument is now documented with vouchered specimens. No inventory of a flora is ever truly complete because no flora remains unchanged through time. At least 19 taxa that were previously documented with herbarium vouchers were not encountered during the field season of 2001. 25 more in List 2 were reported in the monument but never vouchered, or, if they were vouchered they were redetermined during the course of

this study; these taxa may occur in the monument but they were not encountered during the 2001 field season.

List 2: List of Taxa Reported in Devils Postpile National Monument but Without Current Vouchered Documentation

The list includes family, species, synonym in cases where the synonym was the reported name, and comments. Taxa preceded by a – represent vouchered specimens that were redetermined during the course of this study.

Apiaceae *Perideridia bolanderi.*
-**Asteraceae** *Antennaria argentea.* Voucher redetermined to *A. corymbosa*.
Asteraceae *Aster lentus* {*Aster chilensis*}. Out of elevational range. Unlikely. On CNPS's List 1B and RED 2-2-3.
Asteraceae *Cirsium occidentale* var. *californicum* {Cirsium californicum}.
Boraginaceae *Mertensia ciliata* {*Mertensia ciliata* var. *stomatechoides*}.
Brassicaceae *Cardamine californica* {*Dentaria californica*}.
Cornaceae *Cornus sericea* ssp. *occidentalis* {*Cornus occidentalis*}.
Ericaceae *Rhododendron occidentale.*
Fabaceae *Lotus nevadensis.*
-**Fabaceae** *Lupinus duranii* is on CNPS's List 1B and its RED Code is 2-2-3. The voucher housed in the DEPO Herbarium was redetermined to *Lupinus lepidus* var. *sellulus*.
Fabaceae *Trifolium microcephalum.*
Grossulariaceae *Ribes montigenum.*
Liliaceae *Lilium pardalinum.*
Liliaceae *Lilium parvum.*
Liliaceae *Triteleia montana* {*Brodiaea gracilis*}.
Onagraceae *Oenothera elata* ssp. *hirsutissima* {*Oenothera hookeri* ssp. *angustifolia*}.
Ophioglossaceae *Botrychium simplex.*
Orchidaceae *Platanthera sparsiflora.*
Poaceae *Bromus carinatus.*
Poaceae *Bromus tectorum.* Observed near Rainbow Falls by vegetation mapping field crew but no collection made.
Poaceae *Muhlenbergia montana.*
Polemoniaceae *Phlox diffusa.*
-**Polygonaceae** *Polygonum minimum.* Voucher redetermined to *Polygonum polygaloides* ssp. *kelloggii*
Rhamnaceae *Rhamnus ilicifolia* {*Rhamnus crocea* ssp. *ilicifolia*}.
Rosaceae *Fragaria californica* {*Fragaria vesca* ssp. *californica* (?)}. *F. californica* is not recognized in Hickman (1993), just *F. vesca* ssp. *californica* as a synonym of *F. vesca*.
Rosaceae *Rosa californica.*
Rosaceae *Rubus parviflorus.* This was included on the original species list and this year a visitor reported seeing this growing near Rainbow Falls.

Saxifragaceae *Parnassia californica* {*Parnassia palustris* var. *californica*}. This taxon occurs near DEPO on Minaret Creek, but has not been found in DEPO.
Scrophulariaceae *Pedicularis groenlandica.*
Viscaceae *Arceuthobium campylopodum.*

Rare and Endangered Taxa

Three species cited in the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California (2001) were documented in this study (Figure 6). Two of these species were included in the Jones and Stokes draft list of "special-status" plants. One taxon that had previously been documented in Devils Postpile, *Lupinus duranii*, has since been redetermined to *Lupinus lepidus* var. *sellulus* (List 3). Table 3 summarizes the CNPS listings that apply to taxa documented in this study.

List 1B	Plants that are rare, threatened, or endangered in California. All plants on this list meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing.
List 4	Plants of limited distribution – a watch list. While these plants do not generally meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, they are uncommon enough that their status should be regularly monitored.
CNPS R-E-D **Code**	
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.
Endangerment	1. Not endangered. 2. Endangered in a portion of its range.
Distribution	3. Endemic to California.

Table 3. Explanation of CNPS listings that apply to Devils Postpile taxa.

Cinna bolanderi (Poaceae), known from Fresno, Mariposa, and Tulare Counties, is documented from one collection in Devils Postpile: Melanie Arnett - 8425. This taxon is on the CNPS watch list (List 4), and its RED Code is 1-2-3 (Table 2), and is a new record for Madera County. Although this taxon was not included in the Jones and Stokes draft list of special-status plants that might occur in Devils Postpile, the site at which this specimen was collected typifies the known habitat of *Cinna bolanderi*: a moist SSW-facing spring-fed drainage surrounded by Jeffrey pine/red fir forest. Vouchers from this specimen are deposited at both the DEPO and Jepson herbaria.

Hulsea brevifolia (Asteraceae), known from Fresno, Madera, Tulare, and Tuolomne Counties, is documented from five collections in Devils Postpile: Joseph L. Medeiros and W. Eckhardt - no collection number given; Sandra C. Morey - 154; and Melanie Arnett - 8110, 8192, and 8401. This taxon is on CNPS's List 1B, and its RED Code is 2-2-3. It is interesting to note that the morphologic differentiation between *H. brevifolia* and *H. mexicana*, also cited in CNPS (2001), is the number of ray flowers (10-23 and 20-35 respectively) and whether the corolla tube hairs are a mixture of glandular and nonglandular hairs (former) or of all glandular hairs (Hickman 1993). This distinction was not apparent in the specimens examined at the UCJEPS Herbarium. *H. mexicana*, known in the U.S. from only a single location (San Diego County), grows in volcanic substrates and in burned or disturbed sites. *H. brevifolia* is currently quite common in volcanic substrates in the post-fire region of Devils Postpile. Vouchers from this study are deposited at the DEPO, Jepson, and RM herbaria.

Mimulus laciniatus (Scrophulariaceae), known from Amador, Butte, Fresno, Madera, Mariposa, Plumas, Tulare, and Tuolomne Counties, is documented from two

collections in Devils Postpile: Melanie Arnett - 8026 and 8309. This taxon is on the CNPS watch list (List 4), and its RED Code is 1-1-3. Both collections of this taxon were made from seeps on granite, which is in accordance with the habitat given in Hickman (1993). Vouchers from this study are deposited at the DEPO, Jepson, and RM herbaria.

Nonnative Taxa

Of the eight nonnative taxa (List 1) that were documented, *Cirsium vulgare* (bull thistle) was the only taxon in Devils Postpile demonstrating an invasive nature (Figure 7). Numerous populations of this taxon, each consisting of 5-250 individuals, were encountered, especially in the area known as the Buttresses (Figure 3, 7). There is unsupported speculation that the outbreak of *Cirsium vulgare* is caused by packhorses from Reds Meadow Resort, however, the region of the monument where the outbreak is the worst is not traveled by the packhorses. Control measures were taken on all populations of *Cirsium vulgare* at the time they were encountered (see Methods). We recommend that these control measures be continued until the outbreak is under control, especially in the area of the Buttresses. The majority of the other nonnative taxa were found near the ranger station in and around the meadows that are used for access to fishing (Figure 8, 2).

Potential Range Extensions

Based on the range descriptions provided in Hickman (1993), eighteen range extensions were documented with this inventory (List 3). The extension of these ranges varied from a difference of 400 m in elevation, or occurrence within a new geographic subdivision of California.

List 3: Potential Range Extensions

This list inlcudes family, species, the range given in Hickman, and comments. Taxa preceded by a ^ are absent in Yosemite National Park (Botti 2001).

^**Apiaceae** *Sium suave*: < 2000 m. SnFrB (Suisun Marshes), GB; to B.C., e N.Am, e Asia. This is an extension into a new geographic subdivision of California. This specimen was problematic to identify, being somewhat atypical, however Dr. Ronald L. Hartman, an expert in Apiaceae, examined it and verified the determination.

^**Asteraceae** *Aster eatonii*: 500-2000 m. CaR, SN, GB; to B.C., Colorado. This is a minor extension in elevation only.

Asteraceae *Gnaphalium californicum*: < 1800 m. CA-FP (exc GV); OR, Baja CA. This is an extension of elevation only.

Asteraceae *Lactuca serriola*: < 2000 m. CA. This is an extension of elevation only.

Asteraceae *Tragopogon dubius*: 0-2700 m. n SN, SnJV, SnFrB, SCoRO, SnBr, GB. This is an extension southward into c SN.

Boraginaceae *Plagiobothrys hispidus*: 1200-2800 m. CaR, GB; OR, w NV. This is an extension into a new geographic subdivision of California, and is supported by Botti (2001).

Brassicaceae *Barbarea orthoceras*: 700-3350 m. CA-FP (exc SN, GV); to AK, e N. Am, Mex, also in temp Asia. This exception of the SN geographic subdivision should be removed from the given range extension.

Brassicaceae *Lepidium densiflorum* var. *macrocarpum*: < 2200 m. KR, CaR, GB, DMtns, expected elsewhere. Now documented from c SNH.

Brassicaceae *Phoenicaulis cheiranthoides*: 1500-3200 m. NW, CaR, GB; to WA, ID. Now documented from c SNH.

^**Cyperaceae** *Cyperus squarrosus*: 0-1500 m. CA; temp and trop more or less worldwide. This is a significant extension in the Hickman (1993) elevation range of this taxon.

^**Poaceae** *Distichlis spicata*: < 1000 m. CA; s Can, US. This is a significant extension in the Hickman (1993) elevation range of this taxon.

^**Poaceae** *Elymus elymoides* ssp. *elymoides*: 800-4000 m. TR, SnJt, GB, D; to WA, WY, Colorado. This is an extension into a new geographic subdivision of California.

^**Poaceae** *Hordeum brachyantherum* ssp. *californicum*: < 500 m. CA-FP; OR. This is a significant extension in the Hickman (1993) elevation range of this taxon.

Polygonaceae *Eriogonum umbellatum* var. *nevadense*: 1500-3200 m. SN (e slope), GB, nw DMoj; s OR, c NV. This is an extension onto the w slope and is supported by Botti (2001).

^**Rosaceae** *Amelanchier alnifolia* var. *semiintegrifolia*: 50-2500 m. NCo, KR, n NCoRO; to AK, ID. This is an extension into a new geographic subdivision of California.

Rubiaceae *Galium aparine*: 30-1500 m. CA-FP; to AK, e Coast, perhaps native to Europe. This is a significant extension in the Hickman (1993) elevation range of this taxon.

Saxifragaceae *Heuchera rubescens* var. *alpicola*: 1500-4000 m. Habitat of sp. s SN, SNE, DMtns. This is an extension northward into c SN and is supported by Botti (2001).

^**Scrophulariaceae** *Penstemon heterodoxus* var. *cephalophorus*: 2100-3300 m. s SNH. This is an extension northward into c SNH.

DISCUSSION

The results of this inventory support Ertter's (2000) assertion that comprehensive species-level inventories are *not* too cumbersome to be of value, as is generally assumed from both a logistical and financial standpoint. The small size of Devils Postpile provided us with ideal conditions for coupling a species-level inventory with vegetation mapping in a timely and fiscally responsible manner, as is outlined by the Inventory and Monitoring program and advocated by Charlet (2000). The results of this inventory emphasize the fact that a small-scale inventory can yield large-scale results. The 125 percent increase in the documented flora of the monument brings with it numerous other data that are valuable to managers and researchers in many fields of study. Eighteen probable range extensions were documented (List 2), two rare species that were previously unknown in Devils Postpile were documented, one of which represents a new county record. An outbreak of the invasive thistle *Cirsium vulgare* in a portion of the monument that seldom, if ever, sees human visitors was detected in time to get it under control. List 3 offers resource managers an idea of which plant taxa to look for in the future in order to continue increasing our knowledge of the flora of Devils Postpile.

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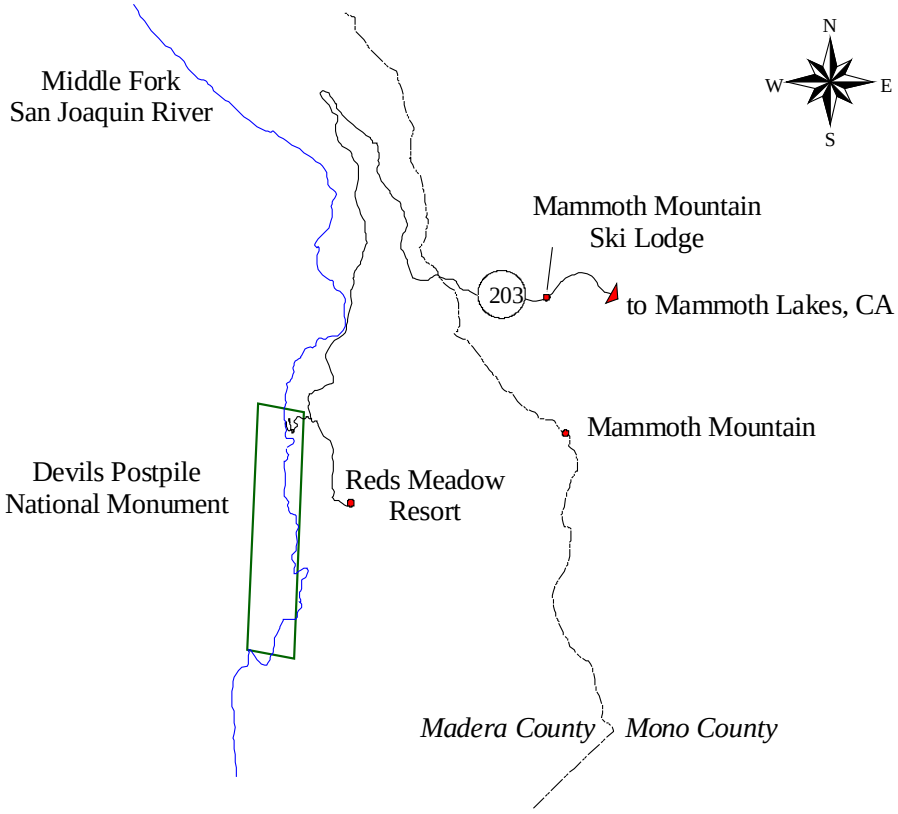

Figure 1. General Vicinity of Devils Postpile National Monument.

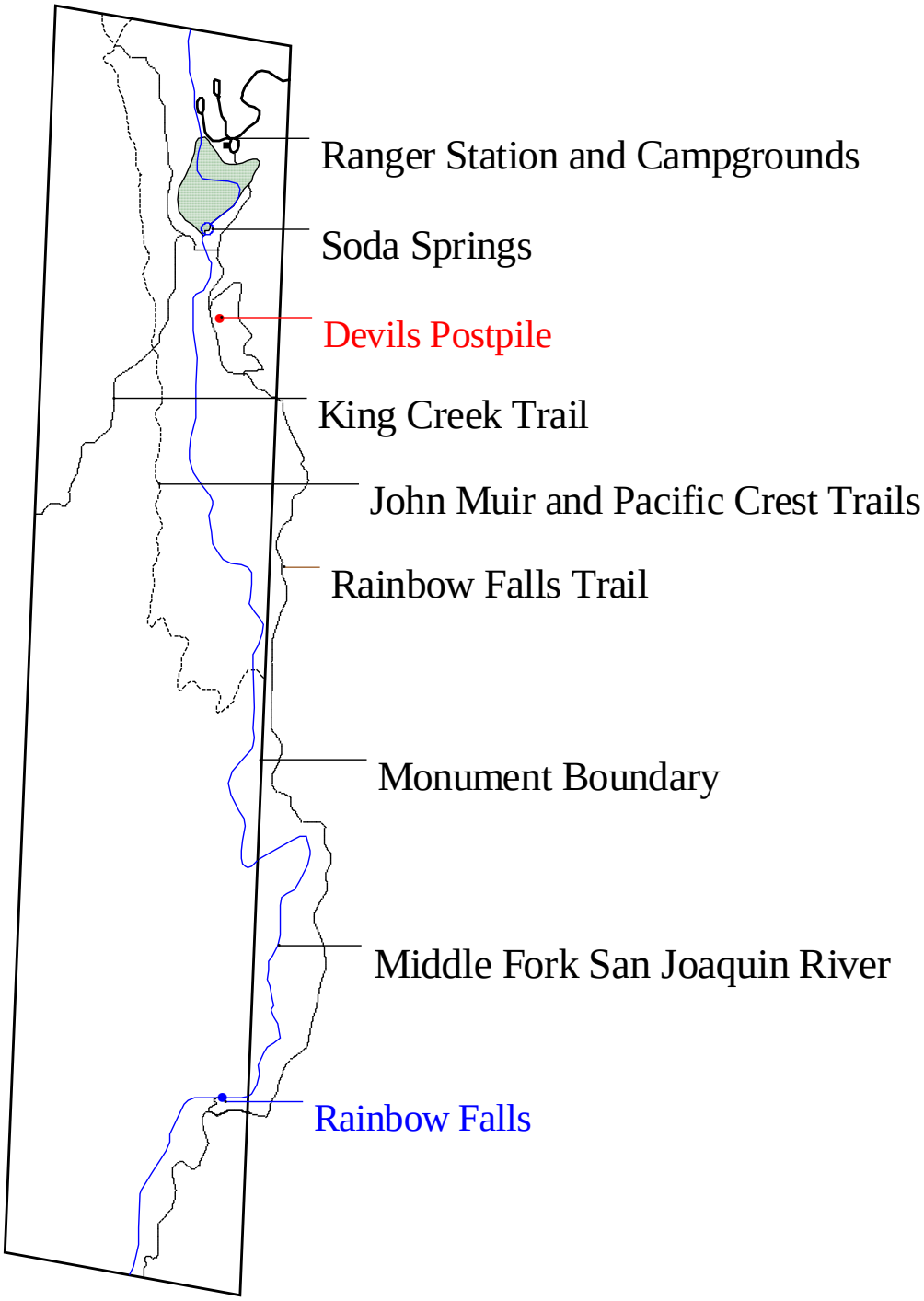

Figure 2. Major features of Devils Postpile National Monument.

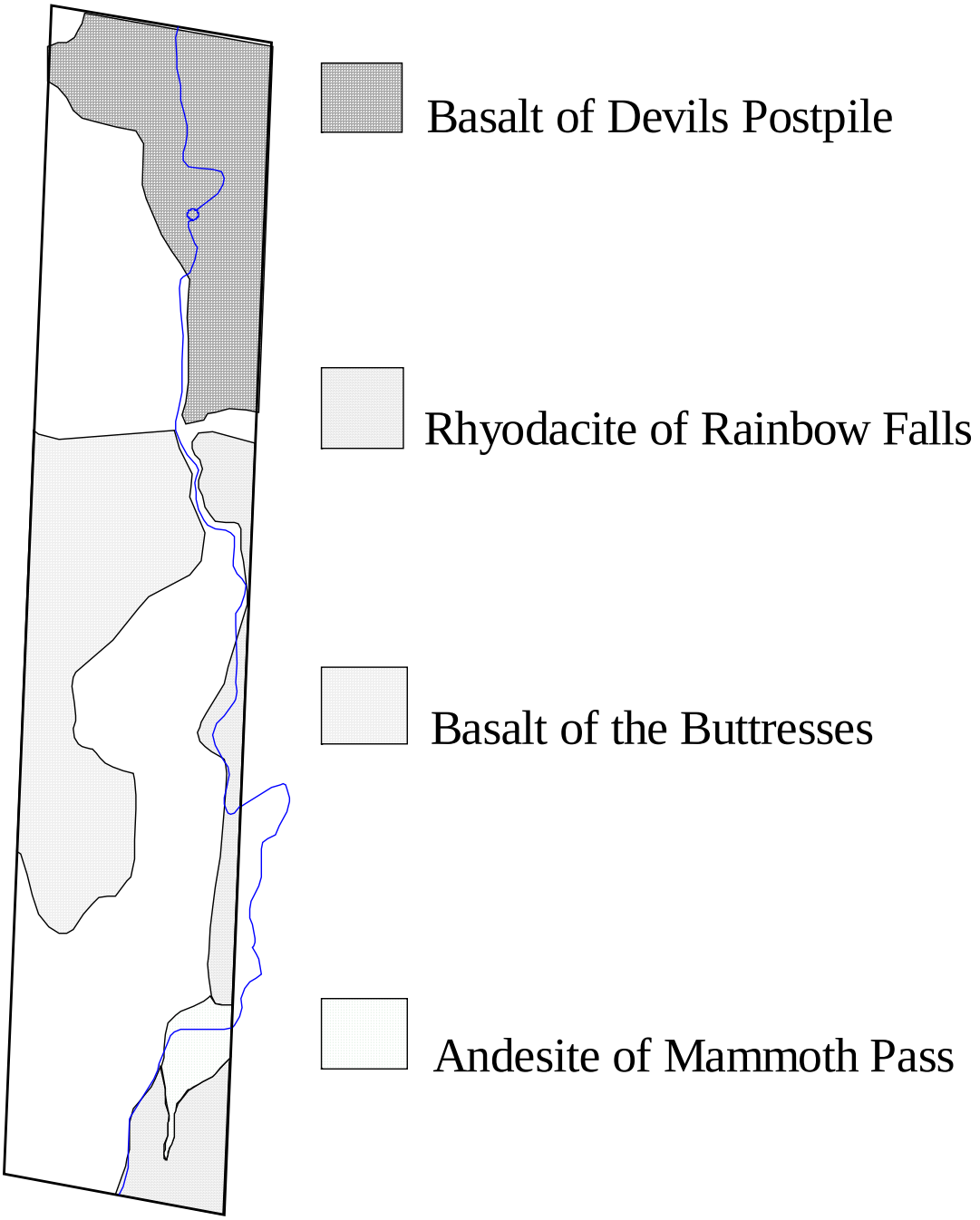

Figure 3. Major geologic units of Devils Postpile National Monument.
Adapted from Clow and Collum (1983).

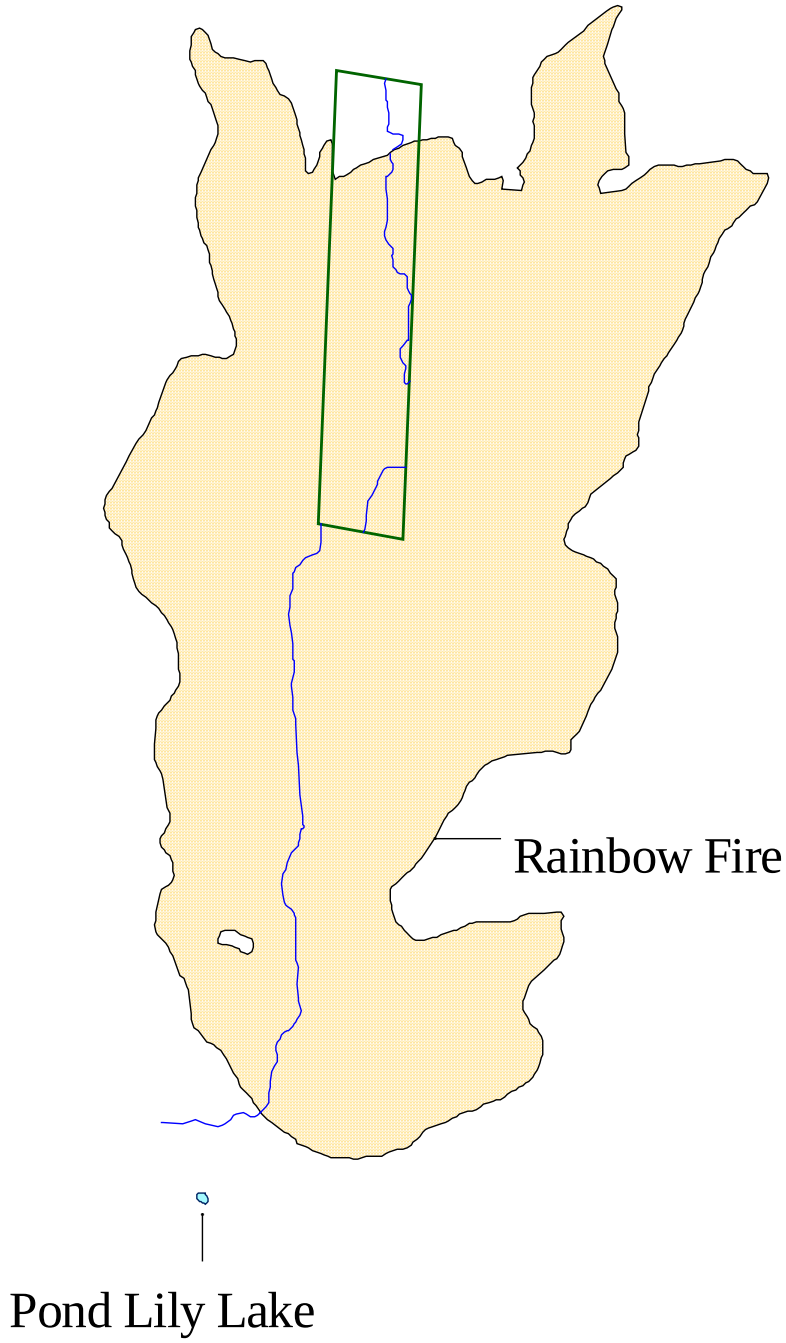

Figure 4. Portion of Devils Postpile National Monument covered by Rainbow Fire.

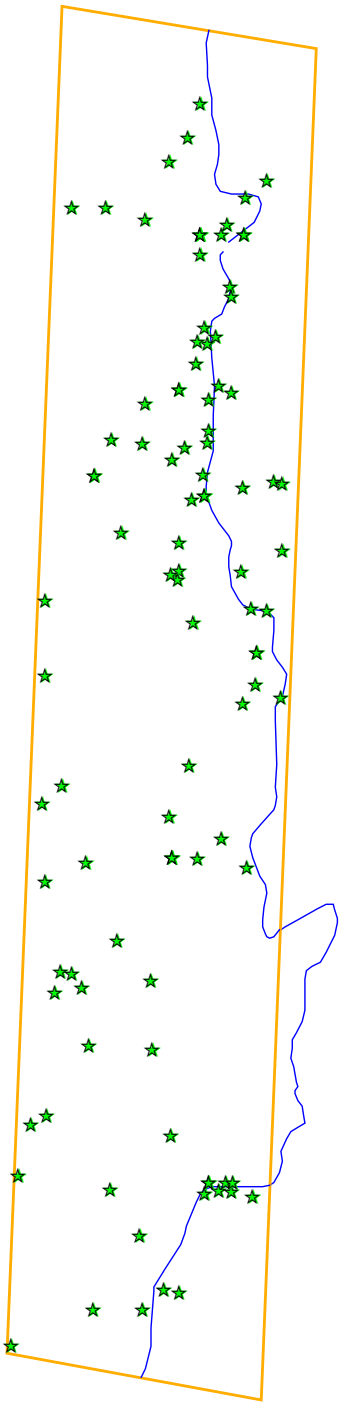

Figure 5. Location of collection sites.

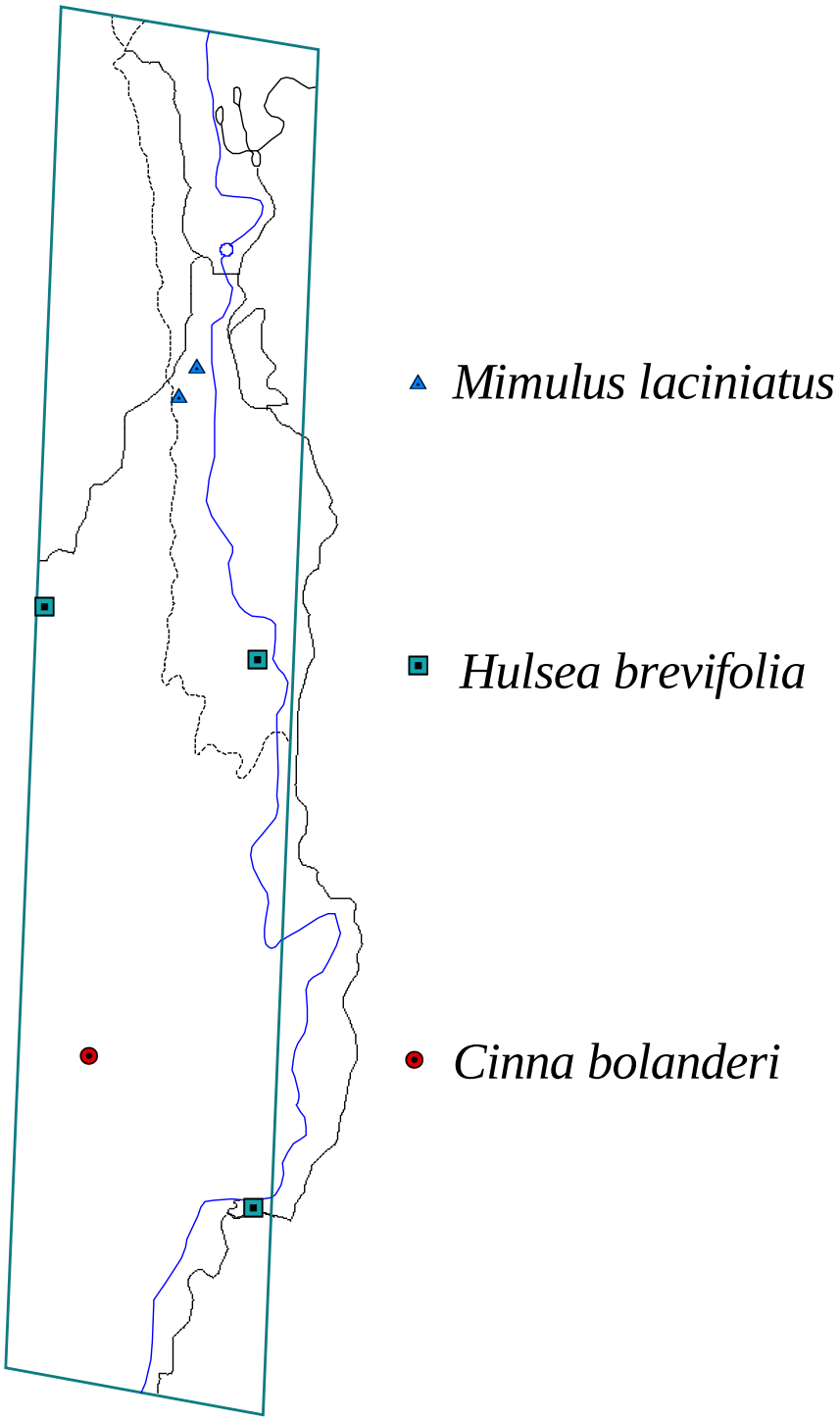

Figure 6. Locations of rare plants in Devils Postpile National Monument.

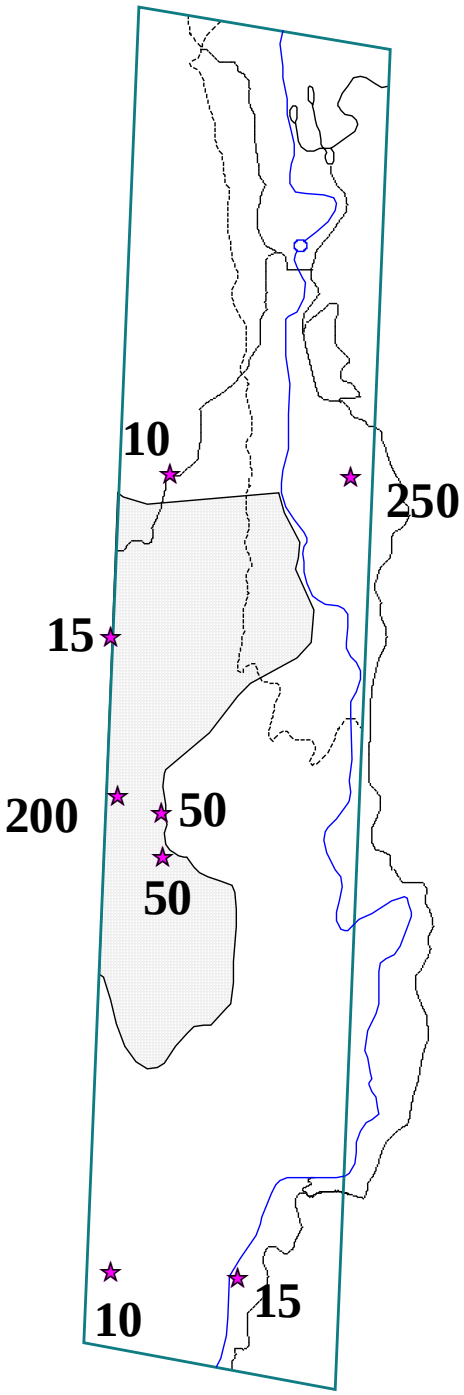

Figure 7. Location and number of individuals in documented populations of *Cirsium vulgare*. The shaded area is known as the Buttresses and many more populations occur in this area than are shown here.

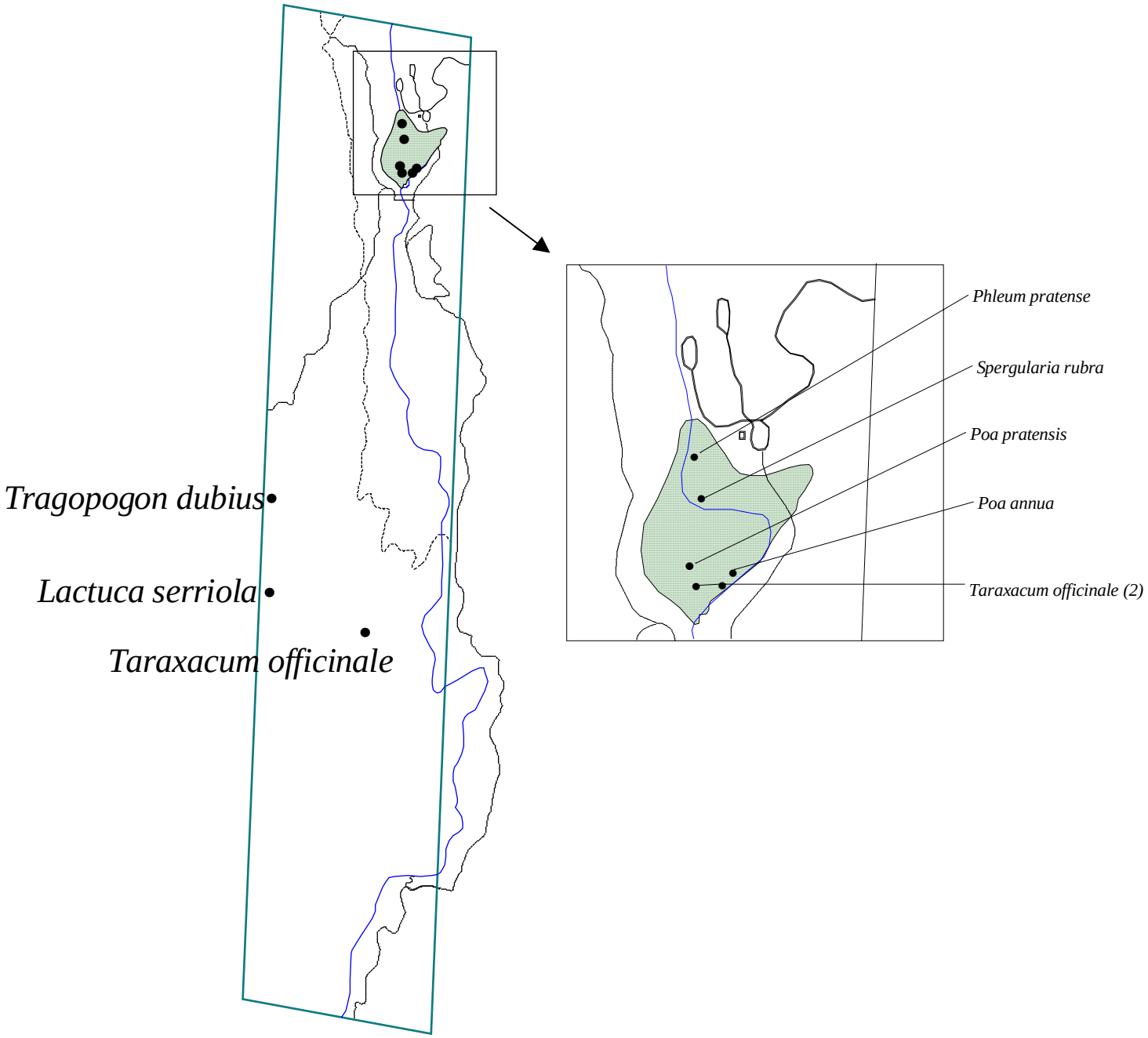

Figure 8. Location of weeds (excluding *Cirsium vulgare*) documented in inventory of Devils Postpile National Monument.

APPENDIX I: Environmental Characteristics of Collection Sites

Each collection site is identified by a sequential number, which is followed by the collecting date, starting and ending collecting numbers, collector(s), UTM coordinates (NAD27 projection), elevation, and a brief site description.

1 6/18/2001 8012 Melanie Arnettt
316133E 4165003N 7,546ft.
Under lodgepole and Jeffrey pines in an undulating topography with litter over degrading granite.

2 6/18/2001 8013-8015 Melanie Arnettt
316055E 4166215N 7,611ft.
W-facing 15% lowslope near Middle Fork San Joaquin River on E side, approximately 0.3 miles S of Ranger Station among basalt outcrops and under lodgepole pines. Sandy substrate.

3 6/18/2001 8016-8017 Melanie Arnettt
316166E 4166534N 7,546ft.
Meadow just S of Ranger Station at beginning of trail to Devils Postpile. Level topography with loamy sand.

4A 6/18/2001 8024-8027 Melanie Arnett
315900E 4165900N 7,634ft.
Granitic seep on E-facing 23% midslope of granite hillside.

4B 6/18/2001 8028 Melanie Arnett
315900E 4165900N 7,634ft.
E-facing 23% midslope of granite hillside in moist, shady pocket with loose pumice over degrading granite.

5 6/18/2001 8036-8037 Melanie Arnett
315987E 4165743N 7,540ft.
West side of Middle Fork San Joaquin River by water's edge.

6 6/18/2001 8034-8035 Melanie Arnett
315881E 4165690N 7,700ft.
W-facing 25% midslope along John Muir Trail on W side of Middle Fork San Joaquin River, approximately 0.3 miles S of Ranger Station. Jeffrey pine / red fir association with litter over degrading granite.

7 6/20/2001 8046-8056 Melanie Arnett with Sylvia Haultain, Linda Mutch
315695E 4165749N 7,710ft.
E-facing 30% midslope in a dry white fir/Jeffrey pine/lodgepole pine forest with some western white pine; loose pumice over degrading granite.

8A 6/20/2001 8057-8076 Melanie Arnett with Sylvia Haultain, Linda Mutch
315643E 4165638N 7,760ft.
Moist N/S tending bench in E-facing overall 30% midslope of large granite outcrop; sag pond and alder thickets in white fir/Jeffrey pine and western white pine forest.

8B 7/27/2001 8422-8423 Melanie Arnett
315643E 4165638N 7,760ft.
Moist N/S tending bench in E-facing overall 30% midslope of large granite outcrop; sag pond and alder thickets in white fir/Jeffrey pine and western white pine forest.

9 6/22/2001 8077-8087 Melanie Arnett
315497E 4164410N 7,851ft.
S-facing 5% overall slope in the Buttresses; at edge of burned forest with 50/50 live/burned Jeffrey pine and white fir and a sparse understory of *Ceanothus*. Loose pumice over sand. A fair number of new white fir and Jeffrey pine seedlings coming up.

10 6/22/2001 8088-8091 Melanie Arnett
315497E 4165036N 7,970ft.
S-facing 10% slope with volcanic rock outcrops and standing dead trees in the Buttresses. Loose pumice over sand.

11 6/22/2001 8092-8108 Melanie Arnett
315545E 4164700N 7,829ft.
S-flowing 2% moist drainage with standing dead trees in the Buttresses. Gravelly sandy loam.

12 6/22/2001 8109-8116 Melanie Arnett
315495E 4165261N 7,990ft.
Top of knoll in Buttresses with standing dead trees and loose pumice over sand.

13 6/23/2001 8117-8145 Melanie Arnett
316031E 4164538N 7,500ft.
E-facing 2% midslope of intermittent riparian and surrounding meadow, ca. 0.1 mi W of the Middle Fork San Joaquin River. Loose pumice over degrading granite. Site surrounded by a 50/50 live/burned lodgepole pine forest with Jeffrey pine and granite outcrops.

14 6/23/2001 8146 Melanie Arnett
316121E 4165238N 7,450ft.
Growing in rock ledge at overpour of Valentine Falls along the Middle Fork San Joaquin River. Substrate granite.

15A 6/23/2001 8147-8153 Melanie Arnett
315879E 4164484N 7,452ft.
N-facing shaded 25% lowslope in Jeffrey pine and red fir forest with loose pumice over degrading granite and substantial granite outcrops.

15B 6/23/2001 8154 Melanie Arnett
315879E 4164484N 7,452ft.
Level terrace with alder thicket in Jeffrey pine and red fir forest with loose pumice over degrading granite and substantial granite outcrops.

15C 6/23/2001 8155-8157 Melanie Arnett
315879E 4164484N 7,452ft.
Collected in willow thicket of saturated terrace in Jeffrey pine and red fir forest with loose pumice over degrading granite and substantial granite outcrops.

16 6/23/2001 8158-8176 Melanie Arnett
315873E 4164608N 7,467ft.
Aspen grove with very lush understory on level topography surrounded by granite outcrops and adjacent to wetland with orchids, sedges, and rushes.

17A 6/24/2001 8177-8188 Melanie Arnett
316022E 4163471N 7,280ft.
N-facing 40% mid- and lowslope and cliffs just W of Rainbow Falls. Jeffrey pine, western white pine, lodgepole pine, red fir and white fir forest. Loose pumice over degrading rhyodacite.

17B 6/24/2001 8187-8188 Melanie Arnett
315979E 4163464N 7,285ft.
W-facing 40% lowslope on E side of Middle Fork San Joaquin River at bend just downstream from Rainbow Falls. Shrubby, rocky hillside. Loose pumice over degrading rhyodacite and granite.

18 6/24/2001 8189-8199 Melanie Arnett
316125E 4163454N 7,458ft.
Dry top and N -facing 35% slopes just E of actual drop of Rainbow Falls on south side of river. Loose pumice over sandy soil derived from degrading granite and rhyodacite.

19 6/24/2001 8200 Melanie Arnett
315692E 4163473N 7,644ft.
Top of large granite outcrop just W of Rainbow Falls.

20 6/24/2001 8201-8206 Melanie Arnett
315932E 4164761N 7,515ft.
Moist S-sloping (ca. 2%) drainage with large stands of *Smilacina* spp., *Veratrum* sp., *Senecio triangularis,* and *Mimulus* spp.

21 6/24/2001 8207-8215 Melanie Arnett
315820E 4163900N 7,350ft.
E-facing 70 % lowslope of granite outcrop. Degrading granite. Jeffery pine forest with scattered western juniper.

22 6/24/2001 8216-8223 Melanie Arnett
315394E 4163000N 7,186ft.
Sandy level ground at SW corner of Devils Postpile National Monument at confluence of the Middle Fork San Joaquin River and Kings Creek. Standing dead trees of burn present.

23 6/25/2001 8224-8234 Melanie Arnett
316062E 4163465N 7,333ft.
S-facing 30% moist slope in mist of Rainbow Falls. Platy rhyodacite.

24 6/25/2001 8235-8237 Melanie Arnett
315818E 4164110N 7,635ft.
E-facing 45% highslope in the Buttresses. Granite capped with basalt. Loose pumice over degrading granite.

25A 6/25/2001 8238 Melanie Arnett
315993E 4163498N 7,280ft.
Level grassy area just W of Rainbow Falls on N/W side of Middle Fork San Joaquin River in Jeffrey pine, white fir, and lodgepole pine forest.

25B 7/ 5/2001 8328 Melanie Arnett
315993E 4163498N 7,280ft.
Level grassy area just W of Rainbow Falls on N/W side of Middle Fork San Joaquin River in Jeffrey pine, white fir, and lodgepole pine forest.

26 6/26/2001 8239-8260 Melanie Arnett
315877E 4165339N 7,700ft.
Along the JMT in the Buttresses at a basalt outcrop and seep on a 35% E-facing slope in a white fir forest.

27 6/26/2001 8261-8267 Melanie Arnett
315977E 4165642N 7,480ft.
E-facing landslide on lower portion of a 40% slope. Approximately 5-20 feet from the W side of the Middle Fork San Joaquin River.

28 6/26/2001 8268 Melanie Arnett
315798E 4166420N 7,700ft.
E-facing 35% granite midslope just SW of Ranger Station in white fir, western white pine, and lodgepole pine forest.

29 6/27/2001 8269-8282 Melanie Arnett
316032E 4166374N 7,545ft.
Meadow and gravel bars on W side of Middle Fork San Joaquin River just SW of Ranger Station.

30A 7/ 3/2001 8283-8303 Melanie Arnett
316099E 4166374N 7,540ft.
Islet on E side of Middle Fork San Joaquin River with alder and willow thickets. Gravelly sand.

30B 7/28/2001 8430-8434 Melanie Arnett
316099E 4166374N 7,540ft.
Islet on E side of Middle Fork San Joaquin River with alder and willow thickets. Gravelly sand.

31 7/ 3/2001 8304-8308 Melanie Arnett
315978E 4166091N 7,545ft.
E-facing 35% lowslope of granite outcrop in lodgepole pine forest near W side of Middle Fork San Joaquin River. Degrading granite.

32 7/ 3/2001 8309-8314 Melanie Arnett
315954E 4165984N 7,560ft.
E-facing 35% midslope of granite outcrop in lodgepole pine forest on W side of Middle Fork San Joaquin River. Degrading granite.

33 7/ 3/2001 8315-8316 Melanie Arnett
315920E 4165724N 7,677ft.
Creeklet on E-facing 35% granite midslope with degrading granite in a lodgepole pine forest with white fir and western juniper.

34 7/ 3/2001 8317-8319 Melanie Arnett
315941E 4165568N 7,611ft.
E-facing 42% midslope in the Buttresses. Basalt scree in lodgepole pine forest with white fir and western juniper. Degrading granite and basalt.

35 7/ 3/2001 8320-8323 Melanie Arnett
315726E 4165467N 7,874ft.
E-facing 10% mid- to highslope in the Buttresses. Burned forest with standing dead trees. Loose pumice over degrading granite (sand).

36 7/ 5/2001 8324-8327 Melanie Arnett
316043E 4163496N 7,333ft.
S-facing 40% moist midslope in mist of Rainbow Falls. Platy rhyodacite.

37 7/ 5/2001 8329 Melanie Arnett
315642E 4163112N 7,460ft.
W-facing 8% highslope of granite outcrop in Jeffrey pine forest. Degrading granite (sand).

38 7/15/2001 8330-8334 Melanie Arnett
315994E 4165777N 7,640ft.
E-facing 35% midslope of granite seep just W of Middle Fork San Joaquin River. Loamy sand.

39 7/15/2001 8335-8339 Melanie Arnett with Daniel Phipps McCoy
315988E 4166041N 7,575ft.
Base of E-facing steep granite outcrop in riparian community of *Alnus incana* ssp. *tenuifolia* and *Cornus sericea*.

40 7/15/2001 8340-8343 Melanie Arnett with Daniel Phipps McCoy
315992E 4165869N 7,550ft.
Base of E-facing steep granite outcrop in riparian community of *Alnus incana* ssp. *tenuifolia* and *Cornus sericea*.

41 7/15/2001 8344-8346 Melanie Arnett with Daniel Phipps McCoy
316096E 4164950N 7,533ft.
Sag pond in N/S bench of rolling granite hills. Muck.

42 7/15/2001 8347-8348 Melanie Arnett with Daniel Phipps McCoy
315957E 4164479N 7,545ft.
W-facing gently rolling 3% midslope surrounded by granite hills in Jeffrey pine, lodgepole pine, and white fir forest. Loose pumice over degrading granite.

43 7/22/2001 8349-8354 Melanie Arnett
316096E 4165604N 7,610ft.
W-facing 15% dry midslope and bench in lodgepole pine, red fir, and Jeffrey pine forest with loose pumice over degrading granite and rhyodacite outcrops.

44 7/22/2001 8355-8356 Melanie Arnett
316213E 4165410N 7,544ft.
Shady bench/meadow in lodgepole pine forest bordering on riparian. Sandy loam.

45 7/22/2001 8357-8365 Melanie Arnett
316089E 4165349N 7,566ft.
W-flowing creek feeding into the Middle Fork San Joaquin River just above a fall. Riparian community dominated by *Alnus incana* ssp. *tenuifolia*.

46 7/24/2001 8366 Melanie Arnett
315681E 4166452N 7,873ft.
NE-facing 25% midslope of red fir Association with litter over degrading granite.

47 7/24/2001 8367 Melanie Arnett
315575E 4166452N 8,000ft.
N-facing 20% midslope in red fir Association with loose pumice over degrading granite.

48A 7/25/2001 8367-8384 Melanie Arnett
316189E 4165624N 7,547ft.
Edges of saturated meadow surrounded by lodgepole pine forest. Loose pumice over degrading granite to drying muck.

48B 7/25/2001 8386-8390 Melanie Arnett
316215E 4165619N 7,547ft.
Saturated meadow in lowland of lodgepole pine forest; dominated by *Carex vesicaria*. Substrate of muck.

49 7/25/2001 8385 Melanie Arnett
316060E 4165890N 7,629ft.
NW-facing 12% dry midslope in lodgepole pine forest with red fir. Loose pumice over degrading granite and basalt outcrops.

50 7/25/2001 8391-8396 Melanie Arnett
315965E 4166311N 7,641ft.
W-facing 20% midslope of basalt outcrop in lodgepole pine forest.

51 7/25/2001 8397 Melanie Arnett
316020E 4165913N 7,545ft.
In vertical cracks of steep (75%) W-facing basalt column cliffs adjacent to the Middle Fork San Joaquin River on the E side.

52A 7/25/2001 8398 Melanie Arnett
315928E 4166669N 7,217ft.
E-facing 18% dry midslope in lodgepole pine forest with loose pumice over degrading granite.

52B 7/25/2001 8399 Melanie Arnett
315966E 4166769N 7,217ft.
Dry terrace just W of Middle Fork San Joaquin River in lodgepole pine forest.

53A 7/26/2001 8400-8401 Melanie Arnett
316136E 4165105N 7,433ft.
N-sloping drainage dominated by *Pteridium aquilinum* in post-burned red fir forest with lodgepole pine. Loose pumice over degrading granite.

53B 7/26/2001 8402 Melanie Arnett
316136E 4165105N 7,440ft.
Sag pond in burned red fir forest with lodgepole pine. Substrate of muck.

54A 7/26/2001 8403- 8404 Melanie Arnett
315904E 4165439N 7,677ft.
E-facing 32% midslope in the Buttresses. White fir forest with red fir on sandy loam with large basalt cobbles.

54B 9/ 7/2001 8482 Melanie Arnett
315904E 4165351N 7,677ft.
E-facing 32% midslope in the Buttresses. White fir forest with red fir on sandy loam. On E-side of JMT near seep and basalt outcrops.

55 7/26/2001 8405-8408 Melanie Arnett
315898E 4165326N 7,675ft.
Seep in E-facing 30% midslope in the Buttresses. Red fir forest with white fir. Sandy loam with surficial pumice.

56 7/26/2001 8409-8410 Melanie Arnett
315943E 4165194N 7,664ft.
S-draining gully in the Buttresses. Burned white fir/red fir forest with steep slopes and basalt outcrops to both the E and W. Loose pumice over degrading granite.

57 7/27/2001 8411 Melanie Arnett
315621E 4164465N 7,771ft.
S-facing 3% drainage in the Buttresses. Rolling hills with basalt outcrops. Loose pumice over degrading granite.

58 7/27/2001 8412-8415 Melanie Arnett
315541E 4164133N 7,715ft.
In the Buttresses on top of SW-facing volcanic cliffs. Post- burned forest. Sandy gravel.

59 7/27/2001 8416-8417 Melanie Arnett
315526E 4164070N 7,600ft.
SW-facing 35% midslope in Buttresses; dominated by *Ceanothus cordulatus, Arctostaphylos patula, Prunus emarginata, Lotus crassifolius,* and *Amelanchier* sp. Basalt hills with loose pumice over sand.

60 7/27/2001 8418-8421 Melanie Arnett
315577E 4164131N 7,700ft.
Edges of crater-like sag pond in Buttresses on a generally SW-facing slope of volcanic origin. Post-burned forest. Loamy sand.

61 7/27/2001 8424-8428 Melanie Arnett
315629E 4163912N 7,590ft.
Southernmost region of Buttresses. Moist SSW-facing drainage from spring on 25-40% slope with basalt outcrops over granite. Jeffrey pine/red fir forest. Mucky, loamy sand.

62 7/28/2001 8429 Melanie Arnett
315875E 4163639N 7,373ft.
Jeffrey pine forest with scattered lodgepole pine and white fir on a W-facing 15% lowslope of a granite gully. Duff over degrading granite.

63A 7/28/2001 8435-8442 Melanie Arnett
315965E 4166374N 7,210ft.
Edge of meadow between graminoids and lodgepole pine forest. Near the footbridge on W side of Middle Fork San Joaquin River just S of Ranger Station. Loamy sand.

63B 7/28/2001 8443 Melanie Arnett
315965E 4166374N 7,210ft.
Edge of soda spring near W side of Middle Fork San Joaquin River by upper footbridge. Muck. Wet meadow.

63C 7/30/2001 8468 Melanie Arnett
315965E 4166374N 7,210ft.
Open depression in graminoid-dominated meadow. Gravelly sand.

64 7/28/2001 8444-8447 Melanie Arnett
316064E 4163498N 7,381ft.
S-facing 33% midslope of flaky rhyodacite just below Rainbow Falls.

65 7/28/2001 8448-8450 Melanie Arnett
315856E 4163169N 7,228ft.
Near trail S of Rainbow Falls in Jeffrey pine, white fir, and lodgepole pine forest. Near burned area. Undulating topography with loose pumice over degrading granite.

66 7/28/2001 8451-8452 Melanie Arnett
315902E 4163162N 7,382ft.
E side of Middle Fork San Joaquin River on W-facing 12% highslope in red fir, white fir, and Jeffrey pine forest. Loose pumice over degrading granite.

67 7/29/2001 8453-8455 Melanie Arnett
316108E 4164454N 7,289ft.
Level bench 10 feet W of Middle Fork San Joaquin River in grassy openings between lodgepole pines and *Salix* sp. Loamy sand.

68 7/29/2001 8456-8457 Melanie Arnett
315451E 4163671N 7,240ft.
In alder thickets under lodgepole pines in lower portion of S-facing drainage. Sandy loam with surficial pumice.

69 7/29/2001 8458 Melanie Arnett
315789E 4163112N 7,298ft.
E-facing 32% granite midslope in sandy cracks of granite hillside.

70 7/29/2001 8459-8462 Melanie Arnett
315415E 4163519N 7,211ft.
Saturated meadow on W boundary of Devils Postpile National Monument. Occasional alder and willow; muck.

71 7/29/2001 8463 Melanie Arnett
315501E 4163698N 7,243ft.
Near alder dominated SW-flowing drainage on drier portion of W-facing slope in Jeffrey pine, lodgepole pine, and white fir forest. Litter over sand.

72 7/30/2001 8464-8466 Melanie Arnett
316104E 4166482N 7,600ft.
In willow thicket on W side of Middle Fork San Joaquin River just S of Ranger Station. Level topography; loamy sand.

73 7/30/2001 8467 Melanie Arnett
316048E 4166401N 7,575ft.
Level meadow dominated by graminoids. Sandy gravel with small cobbles.

74 7/30/2001 8470-8471 Melanie Arnett
315873E 4166594N 7,288ft.
In alder thicket along intermittent riparian under lodgepole pines. Level to gently rolling terrain. Litter over loamy sand.

75 8/ 6/2001 8472 Melanie Arnett
315608E 4164087N 7,721ft.
In cracks and on top of basalt outcrops in the Buttresses. Post-burned forest.

76 8/ 7/2001 8473 Melanie Arnett
316211E 4164965N 7,450ft.
Top of flaky rhyodacite cliffs adjacent to Middle Fork San Joaquin River on E side. Jeffrey pine and lodgepole pine forest. Litter over sand.

77 8/ 7/2001 8474 Melanie Arnett
315715E 4164229N 7,756ft.
E-facing 20% midslope of S-facing drainage in the Buttresses. Loose pumice over sand.

78 8/18/2001 8475 Melanie Arnett
316169E 4165233N 7,664ft.
Bottom of SW-facing basalt cliffs adjacent to Middle Fork San Joaquin River on E side.

79 8/18/2001 8476 Melanie Arnett
316060E 4166183N 7,613ft.
W-facing 42% midslope ca. 5 meters above Middle Fork San Joaquin River on E side in lodgepole pine forest on degrading granite and basalt.

80 8/22/2001 8477 Melanie Arnett with Linda Mutch
315486E 4164647N 7,877ft.
E-facing 12% midslope of small knoll in undulating topography in the Buttresses. Loose pumice over sandy loam.

81 9/ 7/2001 8478 Melanie Arnett
315957E 4166046N 7,648ft.
Crest of E-facing 60% granite hillside on W side of Middle Fork San Joaquin River just W of Postpile formation. Granite substrate.

82 9/ 7/2001 8479-8481 Melanie Arnett
315791E 4165737N 7,700ft.
NE-facing 10% midslope of eroding granite hillside in lodgepole pine, Jeffrey pine, western white pine, white fir, and red fir forest. Loose pumice over degrading granite.

83A 9/ 7/2001 8483-8484 Melanie Arnett
315979E 4165581N 7,572ft.
Bottom of E-facing 40% slope on W side of Middle Fork San Joaquin River on S edge of landslide. Shrubby slope on NE edge of the Buttresses. Lodgepole pine and Jeffrey pine.

83B 6/18/2001 8025 Melanie Arnett
315979E 4165581N 7,572ft.
Bottom of E-facing 40% slope on W side of Middle Fork San Joaquin River on S edge of landslide. Shrubby slope on NE edge of the Buttresses. Lodgepole pine and Jeffrey pine.

84 9/ 7/2001 8485-8487 Melanie Arnett
315783E 4163332N 7,355ft.
E-facing 25% midslope of granite hillside in white fir and Jeffrey pine forest. Litter over degrading granite.

85 6/18/2001 8018 Melanie Arnett
316014E 4166064N 7,545ft.
Basalt rock outcrop just W of Postpile formation on E side of the Middle Fork San Joaquin River.

86 6/18/2001 8020 Melanie Arnett
315800E 4165859N 7,600ft.
E-facing 35% midslope on W side of Middle Fork San Joaquin River along the John Muir Trail approximately 0.45 m S of the ranger station. Sand.