

FLORISTIC CHECKLIST FOR THE HEADWATERS BASIN AREA OF THE NORTH FORK OF THE AMERICAN RIVER, PLACER COUNTY, CALIFORNIA

REXFORD PALMER, BETH LOWE CORBIN, ROY WOODWARD,
and MICHAEL BARBOUR

Botany Department, University of California, Davis 95616

ABSTRACT

A species list of vascular plants was compiled for an 80 km² area, at elevations of 1770–2745 m, on the west slope of the central Sierra Nevada Mountains. The basin area is topographically and geologically diverse, and it supports a rich flora of more than 500 taxa. The area is relatively undisturbed and includes protected portions suitable for long-term research.

The headwaters of the North Fork of the American River, and of its tributary, Onion Creek, arise in an 80 km² basin in Placer County, centering on 39°15'N latitude and 120°20'W longitude. The basin is geologically and topographically diverse, with elevations ranging from 1770 m to 2745 m (Fig. 1). Slopes are typically 10–40%. Geological substrates include Mesozoic granitics of Jurassic or Triassic age, and Tertiary lavas (Burnett and Jennings 1962).

The basin contains two protected areas that have potential for long-term study. One is the Onion Creek Experimental Forest, about 13 km² in area, which is administered by the United States Forest Service's Pacific Southwest Forest and Range Experiment Station. This forest has been listed by The Institute of Ecology–UC Davis (1977, 1981) as an Experimental Ecological Reserve, one of 96 in the nation and 11 in California. These Reserves have been chosen on the basis of site quality, protection, stability, and depth of background information available. The National Science Foundation has begun a program to encourage long-term research in this network of Reserves. The other is the Chickering-American River, 7 km² in area, which recently has been added to the University of California's Natural Land and Water Reserve System, as well as the Institute of Ecology's system. The University encourages long-term studies on such properties.

Mr. Sherman Chickering has been compiling a flora for part of the basin for many years. From 1979 to 1982, the authors have been extending that work, collecting throughout the eastern and northern $\frac{2}{3}$ of the basin, >1770 m, with particular attention to the two protected areas identified above.

GENERAL SITE DESCRIPTION

Although the span of elevation and microenvironment makes a climatic summary difficult, data from nearby weather stations allow one

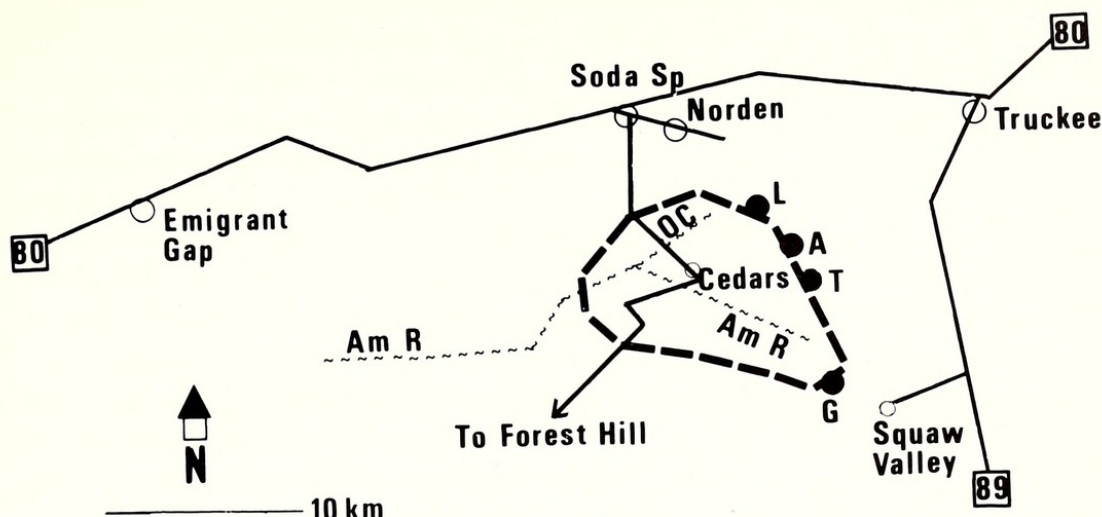


FIG. 1. Headwaters basin area of the North Fork of the American River (Am R) and of its tributary, Onion Creek (OC), as shown by dashed lines. The crest of the Sierra Nevada runs along the eastern edge of the basin, and major peaks are abbreviated: L for Mt. Lincoln (2555 m), A for Anderson Peak (2646 m), T for Tinkers Knob (2727 m), and G for Granite Chief (2745 m). The western edge of the basin corresponds to Heath Springs at an elevation of 1555 m, but for the purposes of the checklist we used a minimum elevation of 1770 m.

to make some climatic generalizations. The United States Forest Service currently maintains a Central Sierra Snow Laboratory at Soda Springs, 6 km north of the basin at an elevation of 2100 m. Using weather data from that station (Smith 1978a, b), from the National Climatic Center (Anonymous 1981), and from a review by Major (1977), we generalize as follows:

Mean annual precipitation is 129 cm, more than 90% of which falls from mid-October to early June; much of this falls as snow. Average snowpack duration is 192 days, and average snowpack depth is 310 cm. Half the years of record show two peak periods of precipitation—early December and mid-March—and half the years show a single peak in early January. Mean annual temperature is 5°C, mean daily maximum for July is 28°C, and mean daily minimum for January is -10°C.

Judging from the recent Forest Service draft of a third order soil survey of the basin (Sutter 1981) and published soil surveys of the adjacent Tahoe Basin (Rogers 1974), major soil series include: 1) Tinker and Tallac on glacial till; 2) Ahart, Meiss, and Waca on volcanics; and 3) Skeletal Granitic Rock Land types. Tinker and Tallac are Inceptisols, well-drained, brown loams, slightly acid (pH 6), 50–150 cm in depth. Meiss is an Inceptisol on slightly weathered volcanic rock, and is a pale brown, neutral sandy loam. Ahart and Waca are Inceptisols on weathered tuff, 59–100 cm in depth, and are brown, acidic, sandy loams. These volcanics are well- to excessively well-drained.

Major forest communities in the basin include white fir-mixed conifer forest, red fir forest, and lodgepole pine forest. Narrow riparian bands with *Populus trichocarpa*, *P. tremuloides*, *Alnus tenuifolia*, and *Salix* spp., or wet meadows dominate drier sites. The red fir and red fir-white fir forests have been quantitatively described for Onion Creek Experimental Forest by Talley (1977); all other communities are similar to those described for the Sierra as a whole by Rundel et al. (1977).

About half the area within the basin is part of Tahoe National Forest. About 25% of the area is held by private home owners who are seasonally present, their homes clustered in a central area called "The Cedars" (Fig. 1). About 10% of the area is in the University of California's Chickering-American River Reserve, and the remainder is owned by American Forest Products and the Southern Pacific Company.

Overall, the effects of human disturbance on the basin have been modest. Logging has occurred in two sections. Some jeep trails and weirs have been constructed in the Onion Creek Experimental Forest and a few other roads exist throughout the basin. Sheep began to graze in the basin in the 19th century, and they still graze in some sections in some years. The Cedars homesites have been present since the start of this century. Old photographs from that time show a more open, pine-dominated forest at 2000 m than the dense, fir-dominated forest at present. Visitors are attracted to the basin for recreational purposes by: 1) the Pacific Crest Trail, which skirts the southeastern portion of the basin; 2) by two unimproved campsites near Onion Creek that are occupied during deer hunting season; and 3) by a dirt road that runs through the basin, connecting Soda Springs to Forest Hill, about 45 km apart.

THE CHECKLIST

Families, genera, and species are listed as in Munz (1959). Nomenclature follows Munz (1959, 1968). The notation "chk" following a taxon means that a specimen is deposited only in the personal collection of Sherman Chickering. All other taxa have voucher specimens deposited with the herbarium of the Botany Department at the University of California, Davis (DAV). After each listed taxon found above 2050 m we have noted floristic affinities according to Stebbins (1982): "1" represents circumboreal, "2" for Lowland California, "3" for Great Basin Desert, and "4" for Old Cordilleran element. We found that 359 out of our complete list of 547 taxa could be associated this way. Of these 359 taxa, 83 (23%) have circumboreal affinities, 91 (26%) Lowland California, 42 (12%) Great Basin, and 142 (39%) Old Cordilleran affinities. This is roughly comparable to the proportions from the whole Sierra Nevada flora cited by Stebbins, except that the Lowland California element is better represented, and the Great Basin Desert less so (OC = 39%, CB = 26%, LC = 19%, GB = 16%) (Stebbins 1982).

Nine species of rare and endangered plants have been determined as potentially occurring within the basin, according to California Natural Diversity Data Base maps: *Berberis sonnei*, *Elodea brandegeae*, *Erigonum umbellatum* var. *torreyana*, *Glyceria grandis*, *Lewisia pygmaea* subsp. *longipetala*, *Rorippa subumbellata*, *Silene invis*a, *Veronica cusickii*, and *Viola tomentosa*. However, only one of these, *Veronica cusickii*, has been collected in the basin in recent years. Its status is listed as rare in California but common elsewhere. We have not yet found any other of the nine species, but it is possible, given the high plant diversity in the Headwaters Basin, that further searches may result in discovery of new populations.

We have no doubt that the checklist is incomplete, and that additional taxa will be found by others in the future. Nevertheless, we believe that the great majority of all taxa are recorded in this list. A total of 61 families of vascular plants are found—one-third of all families in California—with 240 genera and 547 taxa of specific or sub-specific rank. Table 1 lists the 13 largest families and the 17 largest genera. The nine largest families accounted for more than half of all taxa, and the 18 largest genera accounted for over one-fourth of all taxa. Considering that there are about 5000 taxa in the entire state of California (Raven 1977), an area of about 40,500,000 ha, we can conclude that this 8000 ha basin is exceptionally rich. This richness is paralleled by the basin's animal diversity. More than 100 species of birds have been observed in this area (Beedy 1981), and preliminary observations indicate a high diversity of reptiles, amphibians, and insects (Barry, Daley, and Shapiro, pers. comm.).

LYCOPHYTA

Selaginellaceae

Selaginella watsoni 4.

SPHENOPHYTA

Equisetaceae

Equisetum arvense.

Equisetum funstoni.

PTEROPHYTA

Pteridaceae

Athyrium alpestre var. *americanum* 1 chk.

Pellaea brachyptera.

Pellaea breweri 4 chk.

Cheilanthes gracillima 3.

Pellaea bridgesii.

Cryptogramma acrostichoides 1.

Pteridium aquilinum var. *pubescens* 1.

Onychium densum 4 chk.

Aspidiaceae

Cystopteris fragilis 1.

TABLE 1. THE 13 LARGEST FAMILIES AND THE 17 LARGEST GENERA OF THE VASCULAR PLANT FLORA OF THE HEADWATERS BASIN AREA.

Families with 12 or more taxa		Genera with more than 5 taxa	
Family	Taxa	Genus	Taxa
Asteraceae	81	<i>Carex</i>	14
Poaceae	39	<i>Eriogonum</i>	12
Scrophulariaceae	38	<i>Viola</i>	11
Polygonaceae	28	<i>Arabis</i>	11
Brassicaceae	25	<i>Epilobium</i>	10
Fabaceae	24	<i>Polygonum</i>	10
Polemoniaceae	22	<i>Penstemon</i>	9
Cyperaceae	21	<i>Lupinus</i>	8
Rosaceae	20	<i>Mimulus</i>	8
Saxifragaceae	20	<i>Ribes</i>	8
Onagraceae	17	<i>Arnica</i>	8
Ranunculaceae	15	<i>Trifolium</i>	7
Apiaceae	12	<i>Poa</i>	7
		<i>Artemisia</i>	6
		<i>Potentilla</i>	6
		<i>Allium</i>	6
		<i>Ranunculus</i>	6

Total taxa for the Headwaters Basin: 540.
Total genera for the Headwaters Basin: 241.
Total families for the Headwaters Basin: 62.

CONIFEROPHYTA

Pinaceae

<i>Abies concolor.</i>	<i>Pinus monticola</i> 1.
<i>Abies magnifica</i> 4.	<i>Pinus murrayana</i> 4.
<i>Pinus albicaulis</i> 4.	<i>Pseudotsuga menziesii.</i>
<i>Pinus jeffreyi</i> 4.	<i>Tsuga mertensiana</i> 4.
<i>Pinus lambertiana.</i>	

Cupressaceae

<i>Calocedrus decurrens.</i>	<i>Juniperus occidentalis</i> 3.
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ANTHOPHYTA—MONOCOTYLEDONEAE

Amaryllidaceae

<i>Allium amplexans.</i>	<i>Allium tribracteatum</i> 3.
<i>Allium campanulatum</i> 2.	<i>Brodiaea elegans.</i>
<i>Allium obtusum</i> 2.	<i>Brodiaea hyacinthina</i> 2.
<i>Allium parvum</i> chk.	<i>Brodiaea lutea</i> var. <i>analina</i> 2.
<i>Allium platycaule.</i>	

Cyperaceae

- | | |
|------------------------------|---------------------------------|
| <i>Carex athrostachya</i> 4. | <i>Carex nigricans</i> 1. |
| <i>Carex aquatilis</i> 1. | <i>Carex raynoldsii</i> 1. |
| <i>Carex exserta</i> 4. | <i>Carex rossii</i> 4. |
| <i>Carex heteroneura</i> 1. | <i>Carex scopulorum</i> 1. |
| <i>Carex jonesii</i> 4. | <i>Carex stramineiformis</i> 4. |
| <i>Carex multicostata</i> 4. | <i>Carex vernacula</i> 1. |
| <i>Carex nervina</i> 4. | <i>Scirpus congdoni</i> 1. |

Iridaceae

- | | |
|----------------------------------|--------------------------------------|
| <i>Iris missouriensis</i> 2 chk. | <i>Sisyrinchium idahoense</i> 3 chk. |
|----------------------------------|--------------------------------------|

Juncaceae

- | | |
|---------------------------------|----------------------------------|
| <i>Juncus chlorocephalus</i> 4. | <i>Juncus orthophyllus</i> 2. |
| <i>Juncus drummondii</i> 4. | <i>Juncus parryi</i> 4. |
| <i>Juncus mexicanus</i> 4. | <i>Luzula subcongesta</i> 1 chk. |

Liliaceae

- | | |
|--|--|
| <i>Calochortus leichtlinii</i> 2. | <i>Lilium washingtonianum</i> . |
| <i>Chlorogalum pomeridianum</i> . | <i>Smilacina racemosa</i> var. <i>amplexicaulis</i> 4. |
| <i>Fritillaria atropurpurea</i> 2 chk. | <i>Smilacina stellata</i> 1. |
| <i>Fritillaria recurva</i> chk. | <i>Veratrum californicum</i> 1. |
| <i>Lilium parvum</i> 2. | <i>Zigadenus venosus</i> 4. |
| <i>Lilium pardalinum</i> chk. | |

Orchidaceae

- | | |
|---|--|
| <i>Corallorhiza maculata</i> 4. | <i>Habenaria sparsiflora</i> 1. |
| <i>Corallorhiza striata</i> . | <i>Habenaria unalascensis</i> 1. |
| <i>Goodyera oblongifolia</i> . | <i>Spiranthes romanzoffiana</i> 1 chk. |
| <i>Habenaria dilatata</i> var. <i>leucostachys</i> 1. | |

Poaceae

- | | |
|-------------------------------------|-----------------------------------|
| <i>Agropyron trachycaulum</i> 4. | <i>Deschampsia elongata</i> . |
| <i>Agrostis scabra</i> 4. | <i>Elymus glaucus</i> 4. |
| <i>Agrostis variabilis</i> 4. | <i>Glyceria elata</i> 4. |
| <i>Bromus marginatus</i> 2. | <i>Glyceria striata</i> 4. |
| <i>Bromus orcuttianus</i> . | <i>Hordeum brachyantherum</i> 1. |
| <i>Bromus suksdorfii</i> 2. | <i>Hordeum californicum</i> . |
| <i>Bromus tectorum</i> . | <i>Lolium perenne</i> . |
| <i>Calamagrostis canadensis</i> 1. | <i>Melica stricta</i> 4. |
| <i>Dactylis glomerata</i> . | <i>Muhlenbergia filiformis</i> 4. |
| <i>Danthonia californica</i> 2. | <i>Panicum pacificum</i> . |
| <i>Danthonia unispicata</i> . | <i>Phleum alpinum</i> 1. |
| <i>Deschampsia danthonioides</i> 2. | <i>Poa ampla</i> . |

Poa bolanderi 2.
Poa epilis 4.
Poa fendleriana 4.
Poa incurva 4.
Poa palustris.
Poa pratense 1.
Sitanion hystrix 4.
Stipa californica 3.

Stipa columbiana 3.
Stipa lemmonii.
Stipa occidentalis 3.
Stipa williamsii.
Trisetum cernuum var. *canescens*
 1.
Trisetum spicatum 1.
Triticum aestivum.

ANTHOPHYTA—DICOTYLEDONEAE

Aceraceae

Acer glabrum 1.

Apiaceae

Angelica breweri 1.
Cicuta douglasii 1.
Heracleum lanatum 1.
Ligusticum grayi 1.
Lomatium dissectum chk.
Osmorhiza chilensis 2.
Perideridia bolanderi 2.

Perideridia parishii 2.
Pteryxia terebinthina var. *californica* 3.
Sanicula graveolens 2.
Sanicula tuberosa 2.
Sphenosciadium capitellatum 2.

Apocynaceae

Apocynum androsaemifolia 4 chk. *Apocynum pumilum*.

Asclepiadaceae

Asclepias cordifolia chk.

Asteraceae

Achillea lanulosa 1.
Adenocaulon bicolor.
Agoseris glauca var. *laciniata* 4
 chk.
Agoseris glauca var. *monticola* 4
 chk.
Agoseris grandiflora chk.
Agoseris retrorsa.
Anaphalis margaritacea 1.
Antennaria alpina var. *media* 4
 chk.
Antennaria rosea 4.
Antennaria umbrinella chk.
Arnica amplexicaulis 4 chk.
Arnica chamissonis.
Arnica cordifolia 4 chk.

Arnica discoidea var. *alata*.
Arnica longifolia 4 chk.
Arnica mollis 4 chk.
Arnica nevadensis 4 chk.
Arnica parryi subsp. *sonnei* 4.
Artemisia arbuscula 3.
Artemisia cana 3 chk.
Artemisia douglasiana.
Artemisia ludoviciana 3.
Artemisia rothrockii 3.
Artemisia tridentata 3.
Aster alpigenus subsp. *andersonii*
 4 chk.
Aster ascendens chk.
Aster integrifolius 4 chk.
Aster occidentalis 4.

Aster radulinus chk.
Balsamorhiza sagittata 4.
Brickellia grandiflora 3 chk.
Brickellia greenei.
Chaenactis douglasii 4.
Chaenactis nevadensis 4 chk.
Chrysopsis breweri 4.
Chrysopsis villosa var. *hispida*.
Chrysothamnus nauseosus 3.

Circium andersonii 3.
Circium californicum chk.
Circium vulgare.
Crepis acuminata 4 chk.
Crepis modocensis 4 chk.
Crepis occidentalis subsp. *conjuncta* 4 chk.
Erigeron coulteri 4 chk.
Erigeron peregrinus subsp. *calilianthemus* 4.
Erigeron barbellulatus 4 chk.
Erigeron philadelphicus.
Eriophyllum lanatum 2.
Eupatorium occidentale 4.
Gnaphalium californicum.
Gnaphalium palustre 2.
Haplopappus acaulis 3 chk.
Haplopappus bloomeri 4 chk.
Haplopappus suffruticosus 4 chk.

Helianthella californica var. *nevadensis*.
Hieracium albiflorum 4.
Hieracium gracile 4.
Hieracium horridum chk.
Lagophylla ramosissima.
Machaeranthera canescens 3 chk.
Machaeranthera shastensis var. *glossophylla* chk.
Madia elegans 2.
Madia glomerata chk.
Madia gracilis chk.
Madia minima 2.
Microseris nutans 4.
Nothocalais alpestris 4 chk.
Raillardella argentea 4 chk.
Senecio canus 4 chk.
Senecio integerrimus var. *major* 4.
Senecio triangularis 4.
Solidago californica 1.
Solidago canadensis subsp. *elongata* 1 chk.
Solidago multiradiata chk.
Stephanomeria lactucina 3.
Taraxacum laevigatum.
Taraxacum officinale.
Tragopogon dubius.
Whitneya dealbata.
Wyethia mollis 2.

Brassicaceae

Arabis breweri.
Arabis divaricarpa chk.
Arabis drummondii chk.
Arabis hirsuta.
Arabis holboellii var. *pendulocarpa*.
Arabis holboellii var. *retrofracta* 4.
Arabis lemmonii chk.
Arabis lyallii 4.
Arabis platysperma 4.
Arabis puberula chk.
Arabis rectissima chk.
Athysanus pusillus chk.
Barbarea orthoceras.

Cardamine breweri 4.
Cardamine lyallii.
Descurainia richardsonii 3.
Draba densifolia 4 chk.
Erysimum capitatum.
Erysimum perenne 2 chk.
Lepidium densiflorum.
Lepidium virginicum var. *pubescens*.
Lesquerella occidentalis chk.
Phoenicaulis cheiranthoides 3.
Streptanthus tortuosus 3.
Thysanocarpus curvipes.

Betulaceae

Alnus tenuifolia 1.

Boraginaceae

<i>Cryptantha nubigena</i> 3.	<i>Hackelia longituba</i> 4.
<i>Cryptantha simulans</i> .	<i>Hackelia nervosa</i> chk.
<i>Cryptantha torreyana</i> 2.	<i>Plagiobothrys cognatus</i> .
<i>Hackelia jessicae</i> 4.	<i>Plagiobothrys hispidulus</i> 2.

Caprifoliaceae

<i>Lonicera conjugialis</i> 1.	<i>Symphoricarpos acutus</i> 2.
<i>Sambucus caerulea</i> 1.	<i>Symphoricarpos parishii</i> 4.
<i>Sambucus microbotrys</i> 1 chk.	<i>Symphoricarpos vaccinoides</i> 4.

Caryophyllaceae

<i>Arenaria douglasii</i> chk.	<i>Silene douglasii</i> 2.
<i>Arenaria kingii</i> var. <i>glabrescens</i>	<i>Silene menziesii</i> 4.
4.	<i>Silene montana</i> .
<i>Arenaria nuttallii</i> subsp. <i>gracilis</i>	<i>Spergularia rubra</i> .
4 chk.	<i>Stellaria longipes</i> 1.
<i>Arenaria pumicola</i> var. <i>californica</i> 4 chk.	

Chenopodiaceae

<i>Chenopodium atrovirens</i> 3.	<i>Chenopodium incognitum</i> 3.
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Convolvulaceae

Convolvulus malacophyllus chk.

Cornaceae

<i>Cornus occidentalis</i> × <i>C. californica</i> 1.	<i>Cornus stolonifera</i> 1.
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Crassulaceae

<i>Sedum lanceolatum</i> 4.	<i>Sedum rosea</i> subsp. <i>integrifolium</i> .
<i>Sedum obtusatum</i> 4.	

Cuscutaceae

Cuscuta californica 2.

Ericaceae

<i>Arctostaphylos nevadensis</i> 2.	<i>Ledum glandulosa</i> 1 chk.
<i>Arctostaphylos patula</i> 2.	<i>Leucothoe davisiae</i> 4.
<i>Cassiope mertensiana</i> 1.	<i>Phyllodoce breweri</i> 1.
<i>Kalmia polifolia</i> var. <i>microphylla</i>	
1.	

Euphorbiaceae

Euphorbia serpyllifolia

Fabaceae

Astragalus austinae chk.*Astragalus whitneyi* 3.*Lotus crassifolius* 2.*Lotus nevadensis* 2.*Lotus oblongifolius* 2.*Lotus pinnatus* chk.*Lotus purshianus* 2.*Lupinus albicaulis* 2.*Lupinus andersonii* var. *apertus* 2.*Lupinus arbustus* subsp. *silvicola* 4 chk.*Lupinus caudatus* 3.*Lupinus latifolius* chk.*Lupinus lyallii* 4 chk.*Lupinus meionanthus* 4 chk.*Lupinus polyphyllus* subsp. *superbus* 2.*Medicago lupulina* chk.*Medicago sativa*.*Trifolium cyathiferum* 2.*Trifolium longipes* 4.*Trifolium microcephalum* 2.*Trifolium monanthum* var. *parvum* 2.*Trifolium pratense* chk.*Trifolium productum* 4.*Trifolium repens* chk.

Fagaceae

Chrysolepis sempervirens 2.*Quercus chrysolepis* var. *nana* × *Quercus vaccinifolia* 2.*Q. vaccinifolia*.

Fumariaceae

Dicentra uniflora 4.

Hydrophyllaceae

Draperia systyla.*Hesperochiron pumilus* 3 chk.*Hydrophyllum capitatum* var. *alpinum*.*Hydrophyllum occidentale* 3.*Nama lobbii*.*Nemophila spatulata* 2.*Phacelia frigida* subsp. *dasyphylla* chk.*Phacelia hydrophylloides* 2 chk.*Phacelia marcescens*.*Phacelia mutabilis* 2.*Phacelia ramosissima*.

Hypericaceae

Hypericum anagalloides 2.

Lamiaceae

Agastache urticifolia 2.*Monardella odoratissima* subsp. *glauca* 2.*Monardella odoratissima* subsp. *pallida* chk.*Prunella vulgaris* subsp. *lanceolata* chk.*Scutellaria californica*.*Stachys rigida* 2 chk.*Trichostema oblongum*.

Linaceae

Linum perenne subsp. *lewisii*.

Loasaceae

Mentzelia dispersa chk.

Loranthaceae

Arceuthobium douglasii.

Malvaceae

Sidalcea glaucescens 2 chk.

Sidalcea oregana.

Sidalcea oregana subsp. *spicata*

2.

Onagraceae

Boisduvalia densiflora 2 chk.

Circaea alpina var. *pacifica*.

Epilobium adenocaulon 4.

Epilobium angustifolium 4.

Epilobium brevistylum chk.

Epilobium glaberrimum 4 chk.

Epilobium glandulosum chk.

Epilobium hornemannii chk.

Epilobium obcordatum 4.

Epilobium oregonense 4.

Epilobium paniculatum.

Epilobium pringleanum 4.

Gayophytum diffusum 4.

Gayophytum humile 4.

Gayophytum nuttallii chk.

Zauschneria californica subsp. *latifolia* 2.

Orobanchaceae

Orobanche californica var. *cor-ymbosa* chk.

Orobanche fasciculata chk.

Orobanche grayana.

Orobanche uniflora var. *purpurea* chk.

Orobanche uniflora var. *sedi* chk.

Paeoniaceae

Paeonia brownii 4.

Plantaginaceae

Plantago lanceolata.

Plantago major.

Polemoniaceae

Allophyllum integrifolium 2.

Allophyllum violaceum chk.

Collomia grandiflora 2.

Collomia linearis 2 chk.

Collomia tinctoria 2.

Gilia capillaris 2.

Gilia leptalea 2.

Gilia leptalea subsp. *bicolor*.

Ipomopsis aggregata chk.

Ipomopsis aggregata subsp. *attenuata* 4 chk.

Ipomopsis congesta subsp. *montana* 4 chk.

Leptodactylon pungens subsp. *pulchriflorum* 2.

Linanthus ciliatus 2.

Linanthus montanus.

Navarretia breweri 2.
Navarretia divaricata 2.
Navarretia minima.
Navarretia propinqua.

Phlox diffusa 3.
Phlox gracillis chk.
Polemonium californicum 4.
Polemonium pulcherrimum 4 chk.

Polygonaceae

Eriogonum incanum.
Eriogonum lobbii 4.
Eriogonum marifolium chk.
Eriogonum nudum 2.
Eriogonum nudum var. *deductum*.
Eriogonum ovalifolium subsp. *vineum* 3 chk.
Eriogonum rosense chk.
Eriogonum spergulinum var. *red-dingianum* 2.
Eriogonum umbellatum subsp. *covillei* 4.
Eriogonum umbellatum var. *umbellatum* 4.
Eriogonum ursinum chk.
Eriogonum wrightii subsp. *subscaposum* 3.

Oxyria digyna chk.
Polygonum bistortoides chk.
Polygonum davisiae 1.
Polygonum douglasii 1.
Polygonum douglasii var. *johnstonii* chk.
Polygonum kelloggii 4.
Polygonum lapathifolium.
Polygonum minimum 4.
Polygonum phytolaccaefolium 1.
Polygonum shastense 1.
Polygonum spergulariaeforme chk.
Rumex acetosella chk.
Rumex angiocarpus.
Rumex crispus chk.
Rumex paucifolius 1.
Rumex triangulivalvis.

Portulacaceae

Calyptridium umbellatum.
Claytonia lanceolata 4 chk.
Lewisia nevadensis 4.
Lewisia triphylla 4.

Montia chamissoi 4 chk.
Montia parvifolia 4 chk.
Montia perfoliata.
Montia perfoliata var. *depressa*.

Primulaceae

Dodecatheon alpinum subsp. *majus* 4. *Dodecatheon jeffreyi* 4 chk.

Pyrolaceae

Allotropa virgata chk.
Chimaphila menziesii.
Pleuricospora fimbriolata 2.
Pterospora andromedea 4.

Pyrola asarifolia var. *purpurea* 1 chk.
Pyrola picta 1.
Sarcodes sanguinea 4.

Ranunculaceae

Aconitum columbianum 1.
Anemone drummondii 4 chk.
Anemone occidentalis 1 chk.
Aquilegia formosa 4.
Caltha howellii 1.
Delphinium depauperatum 2.

Delphinium sonnei.
Ranunculus alismaefolius var. *alismellus* 4 chk.
Ranunculus alismaefolius var. *hartwegii* chk.
Ranunculus cymbalaria chk.

<i>Heuchera micrantha</i> var. <i>erubescens</i> .	<i>Parnassia fimbriata</i> chk.
<i>Heuchera rubescens</i> var. <i>glaucescens</i> chk.	<i>Parnassia palustris</i> 1 chk.
<i>Lithophragma bulbifera</i> chk.	<i>Ribes cereum</i> .
<i>Lithophragma glabrum</i> 2.	<i>Ribes inebrians</i> 4.
<i>Lithophragma parviflora</i> .	<i>Ribes lasianthum</i> 2.
<i>Mitella breweri</i> 1.	<i>Ribes montigenum</i> 4 chk.
	<i>Ribes nevadense</i> 2 chk.
	<i>Ribes roezlii</i> 2.

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| <i>Ribes viscosissimum</i> 4. | <i>Saxifraga bryophora</i> 1. |
| <i>Ribes viscosissimum</i> var. <i>halli</i> . | <i>Saxifraga nidifica</i> 2. |
| <i>Saxifraga aprica</i> 2. | <i>Saxifraga odontoloma</i> 1 chk. |

Scrophulariaceae

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| <i>Castilleja applegatei</i> 2. | <i>Orthocarpus copelandii</i> var. <i>cryptanthus</i> 3. |
| <i>Castilleja miniata</i> 4. | <i>Orthocarpus hispidus</i> 2. |
| <i>Castilleja nana</i> 3. | <i>Pedicularis attolens</i> 1. |
| <i>Castilleja piersonii</i> chk. | <i>Pedicularis groenlandica</i> 1. |
| <i>Castilleja pilosa</i> 3. | <i>Pedicularis semibarbata</i> 1. |
| <i>Castilleja pruinosa</i> 3. | <i>Penstemon deustus</i> 4. |
| <i>Collinsia parviflora</i> 2. | <i>Penstemon gracilentus</i> . |
| <i>Collinsia torreyi</i> var. <i>torreyi</i> chk. | <i>Penstemon heterodoxus</i> 4 chk. |
| <i>Collinsia torreyi</i> var. <i>wrightii</i> 2. | <i>Penstemon laetus</i> . |
| <i>Cordylanthus pilosus</i> subsp. <i>bo-landerii</i> . | <i>Penstemon laetus</i> subsp. <i>roezlii</i> 2 chk. |
| <i>Cordylanthus tenuis</i> . | <i>Penstemon lemmonii</i> . |
| <i>Mimulus breweri</i> 3. | <i>Penstemon newberryi</i> 4. |
| <i>Mimulus cardinalis</i> . | <i>Penstemon oreocharis</i> 4. |
| <i>Mimulus guttatus</i> 2. | <i>Penstemon speciosus</i> 3 chk. |
| <i>Mimulus lewisii</i> 4. | <i>Scrophularia californica</i> . |
| <i>Mimulus microphyllus</i> chk. | <i>Verbascum thapsus</i> . |
| <i>Mimulus moschatus</i> 4. | <i>Veronica cusickii</i> 1 chk. |
| <i>Mimulus primuloides</i> 4. | <i>Veronica serpyllifolia</i> var. <i>humifusa</i> 1. |
| <i>Mimulus tilingii</i> 2. | |
| <i>Mimulus torreyi</i> 2. | |

Solanaceae

- Solanum xantii* var. *montanum* chk.

Urticaceae

- Urtica holosericea*.

Valerianaceae

- Valeriana capitata* subsp. *capitata* 1 chk.

Verbenaceae

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| <i>Verbena hastata</i> chk. | <i>Verbena officinalis</i> . |
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Violaceae

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| <i>Viola adunca</i> chk. | <i>Viola beckwithii</i> 3 chk. |
| <i>Viola bakeri</i> 4. | <i>Viola glabella</i> 2. |

<i>Viola lobata</i> chk.	<i>Viola purpurea</i> subsp. <i>mesophyta</i> .
<i>Viola macloskeyi</i> 1.	
<i>Viola purpurea</i> 2.	<i>Viola purpurea</i> subsp. <i>xerophyta</i> .
<i>Viola purpurea</i> subsp. <i>integrifolia</i> .	<i>Viola sheltonii</i> .

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