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Checklist of the Vascular Plants of Goat Marsh Research Natural Area

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Abstract

Lists 259 vascular plant taxa found in the 483-hectare Goat Marsh Research Natural Area, Gifford Pinchot National Forest, southern Cascade Range, Washington. Notes on habitats, community types, and abundance are included for most taxa.

Keywords: Checklists (vascular plants), vascular plants, natural areas (research), Washington (Goat Marsh Research Natural Area).

Purpose

This report provides scientists, educators, and land managers with baseline information on the presence, location, and abundance of vascular plants in the Goat Marsh Research Natural Area. In the future, changes in the vegetation—additions, deletions, changes in abundance, and shifts in habitat—can be determined from this baseline. The checklist can also be used in evaluating the effects of human activities in equivalent ecosystem types.

Environment

Goat Marsh Research Natural Area occupies a 483-hectare (1,193-acre) tract in the Gifford Pinchot National Forest in the Cascade Range of southern Washington. The Research Natural Area (RNA), administered by the St. Helens Ranger District was established in 1974 to fill five “natural area needs” of the Western Slopes and Crest Province, Washington Cascade Range (Dyrness et al. 1975). These “needs” are typical ecosystems, communities or habitats, or aggregations of rare plants or animals that have been identified as requiring representation in a regional natural area system (Dyrness et al. 1975):

1. Noble fir (*Abies procera*) forest.
2. Recent mudflow with lodgepole pine (*Pinus contorta*) cover.
3. Marsh and swamp ecosystem.
4. Marsh area.
5. Bog area.

The RNA also preserves the finest known stand of noble fir (based on volume) for scientific and educational purposes (Franklin and Wiberg 1979).

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Elevation ranges from 885 meters (2,950 feet) at the outlet of Coldspring Creek to 1 490 meters (4,965 feet) at the summit of Goat Mountain. Topography is essentially flat in the 179-hectare (442-acre) wetland which occupies the central portion of the RNA. Slopes are gentle to moderate along the 189-hectare (467-acre) northern and eastern portions, but the 115 hectares (284 acres) along the flanks of Goat Mountain on the southern and western boundaries of the area are steep to precipitous (Franklin and Wiberg 1979).

The RNA is located along the lower flanks of Mount St. Helens, an active volcano. The wetlands appear to have been formed 300 to 450 years ago when one or more hot pyroclastic (mud) flows moved down the southwest flank of Mount St. Helens and blocked the normal flow of Coldspring Creek. Air-laid deposits of pumice, ash, and lapilli from Mount St. Helens in the soil on the flank of Goat Mountain are evidence of Recent volcanic activity (Franklin and Wiberg 1979). The extent to which volcanic eruptions in 1980 affected the structure and composition of vegetation in the RNA is uncertain, although several centimeters of fresh volcanic sand have been deposited on the area.

Bodies of water were also affected by the eruptions in 1980. The beaver pond dried up in the summer, along with most of the small pond just south of the RNA. They refilled during the winter, and whether this is going to be a seasonal occurrence remains to be seen.

A wet, cool maritime climate prevails; little of the annual precipitation occurs from June to August. The average annual snowfall for the nearby Spirit Lake Ranger Station is 767 centimeters (302 inches) (Franklin and Wiberg 1979).

Soils in the RNA are highly variable. Organic soil profiles are found in the low marshy areas. Soils on the pyroclastic flows are generally an unstratified and poorly sorted mass of pebble- and cobble-size rock fragments in a friable sandy matrix; depth of rootable material on the surface of the flow ranges from 15 to 45 centimeters (6 to 18 inches). Inceptisols derived principally from air-laid pumice and ash characterize the uplands (Franklin and Wiberg 1979).

Habitats or Community Types

Five major habitats or community types have been identified in the Research Natural Area by Franklin and Wiberg (1979). We have identified three additional types. A brief description of each of these eight habitats or community types follows since plant taxa in this checklist are related to them. We use a symbol in the checklist to designate a particular habitat or community type:

| Symbol | Habitat or community type | Area |
|--------|--|--------------------|
| WET | Wetland (marsh, pond, swamp, bog) | 179 ha (442 acres) |
| MUD | Mudflow forest (dominated by lodgepole pine) | 157 ha (388 acres) |
| DECID | Deciduous forest | 28 ha (69 acres) |
| ABPR | Noble fir forest | |
| CC | Clearcut | 4 ha (10 acres) |
| TSHE | Western hemlock-Pacific silver fir forest | 115 ha (284 acres) |
| AV | Avalanche chute | |
| ROCK | Rock headwalls and rocky ridges | |

Wetland (WET). Wetlands occupy the central portion of the RNA. Wetland extends east and north from along the eastern base of Goat Mountain, grading into shrub and scrub forest ecotones on the north, northeast, and east (Franklin and Wiberg 1979). Dominants typically include a wide variety of *Carex* spp., low-growing *Salix* spp., and *Vaccinium* spp. (predominantly *Vaccinium occidentale* Gray). Numerous other taxa occur as minor elements in the wetland type, adding significantly to the floristic richness of the RNA.

Mudflow forest (MUD). The forests in the eastern third of the RNA reflect the generally unfavorable substrate. Open, low-vigor stands of lodgepole pine are typically associated with a sparse and depauperate understory where *Arctostaphylos uva-ursi* and *A. nevadensis* represent the only prominent vascular plants. A dense and species-rich ground layer of mosses and lichens is present in this type.

Where moisture is greater or depth of rootable substrate increases, the number of vascular plant taxa greatly increases. The northern edge of the mudflow forest grades into the noble fir and deciduous forests on the north. Both overstory and understory are more diverse in these areas. Associates on these better habitats include Douglas-fir (*Pseudotsuga menziesii* (Mirbel) Franco), western hemlock (*Tsuga heterophylla* (Raf.) Sarg.), and noble fir (*Abies procera* Rehder) (Franklin and Wiberg 1979). A similar increase in diversity is evident along streams in the mudflow where *Alnus sinuata*, *Epilobium* spp., numerous grasses, and a variety of riparian species occur.

Deciduous forest (DECID). A small, gently sloping area north of the mudflow forest and south-southwest of the noble fir forest is dominated by the deciduous tree species black cottonwood (*Populus trichocarpa* Torr. and Gray). Codominants include noble fir, western hemlock, and red alder (*Alnus rubra* Bong.) as minor components. The understory is diverse but composed of taxa found throughout much of the RNA.

Noble fir forest (ABPR). Old-growth noble fir forest occurs on the flats and lower mountain slopes around the wetland. There are large volumes of standing dead trees and down logs in this type. Douglas-fir is the second most important species ranked by volume, followed by minor components of Pacific silver fir (*Abies amabilis* (Dougl.) Forbes) and western hemlock. The primarily herbaceous understory is characteristic of the most productive subalpine habitat types: *Abies amabilis*/*Streptopus roseus* and *A. amabilis*/*Oxalis oregana* (Franklin 1966). Major species are *Acer circinatum*, *Achlys triphylla*, *Vancouveria hexandra*, *Streptopus roseus* var. *curvipes*, *Tiarella trifoliata* var. *unifoliata*, *Oxalis oregana*, *Gymnocarpium dryopteris*, *Coptis laciniata*, *Anemone deltoidea*, *Viola orbiculata*, and *Cornus canadensis* (Franklin and Wiberg 1979).

Clearcut (CC). A 4-hectare (10-acre) clearcut occurs along the northwest boundary of the RNA. It is composed of many taxa typical to midelevation, western Cascades clearcuts. Dominants include: Douglas-fir, *Dactylis glomerata*, *Anaphalis margaritacea*, *Hypochaeris radicata*, *Senecio jacobaea*, *Rubus ursinus*, *Chrysanthemum leucanthemum*, *Luzula divaricata*, and *Campanula scouleri*.

Western hemlock-Pacific silver fir forest (TSHE). The western third of the RNA is dominated by western hemlock and Pacific silver fir forest on steep, broken slopes. Although individual trees are often large, stand volumes vary greatly with topography (Franklin and Wiberg 1979). Noble fir is also a major overstory component in some stands. *Vaccinium ovalifolium*, *V. alaskaense*, *V. membranaceum*, and *Menziesia ferruginea* alternately dominate the shrub layer. Major herbaceous taxa include *Tiarella trifoliata* var. *unifoliata*, *Chimaphila umbellata*, *Achlys triphylla*, and *Vancouveria hexandra*.

Avalanche chute (AV). In the western hemlock-Pacific silver fir forest are two additional distinctive habitats. On the steep, eastern slopes of Goat Mountain, a series of avalanche chutes extend from rock headwalls and the summit ridge 100 to 500 meters downslope toward the wetland. *Alnus sinuata* dominates throughout this type, and *Aruncus sylvestris*, *Rubus spectabilis*, and *Mitella breweri* are minor components.

Rock headwalls and rocky ridges (ROCK). Along the summit ridge and some of the spur ridges to Goat Mountain, open assemblages of plants may be found. These habitats alternate with a subalpine fir-Pacific silver fir-mountain hemlock (*Abies lasiocarpa*-*A. amabilis*-*Tsuga mertensiana*) forest at higher elevations. The open, rocky areas support a distinct assemblage of vascular plants: *Saxifraga ferruginea* var. *macounii*, *Athyrium distentifolium* var. *americanum*, *Corylus cornuta* var. *californica*, *Phyllodoce empetriformis*, *P. glanduliflora*, *Lewisia columbiana* var. *rupicola*, *Juniperus communis* var. *montana*, *Lilium columbianum*, *Spiraea densiflora*, *Menziesia ferruginea*, *Holodiscus discolor*, and numerous grass species.

The Checklist

The list includes all vascular plant taxa identified in the Goat Marsh Research Natural Area during field visits on June 15, 16, 23, 24; July 21, 22; and August 4, 1979. A few taxa are included that were not sighted in 1979 but were previously recorded in unpublished field notes. Plants growing within 10 meters (32.8 feet) of roads were not listed unless they occurred elsewhere in the RNA.

Taxa for which no collection numbers (numbers and letters in parentheses after a listing) are shown were identified in the field by the authors. Vouchers were verified in the herbaria at the University of Washington, Seattle, and Oregon State University, Corvallis, and are deposited at the University of Washington, Seattle.

Families, genera, and species are arranged alphabetically. Scientific nomenclature and taxonomy follow Hitchcock and Cronquist (1973). Common names are from Hitchcock and Cronquist (1973), Franklin and Dyrness (1973), and Garrison et al. (1976). Additional references for flora include Hitchcock et al. (1955-69).

We have attempted to identify only the major distribution among habitats and community types for each species. Abundance of species was qualitatively estimated in the field and is recorded in the checklist on the following scale: rare, infrequent, occasional, frequent, abundant. Only the collection site has been listed for taxa with inadequate data on distribution and abundance.

- Aceraceae** *Acer circinatum* Pursh, vine maple — frequent in TSHE and DECID, occasional in ABPR.
Acer glabrum Torr. var. *douglasii* (Hook.) Dippel, Rocky Mountain maple — rare to infrequent in ROCK.
- Apocynaceae** *Apocynum androsaemifolium* L., spreading dogbane — rare in AV.
- Araliaceae** *Oplopanax horridum* (Smith) Miq., devilsclub — occasional in AV.
- Aristolochiaceae** *Asarum caudatum* Lindl., wild ginger — infrequent in TSHE and DECID, rare in CC.
- Berberidaceae** *Achlys triphylla* (Smith) DC., deerfoot vanillaleaf — abundant in ABPR and DECID, occasional in CC, infrequent in TSHE.
Berberis nervosa Pursh, Oregongrape — abundant in TSHE, infrequent in ROCK.
Vancouveria hexandra (Hook.) Morr. & Dec., white inside-out-flower — frequent in ABPR and DECID, occasional in TSHE and CC, infrequent in MUD.
- Betulaceae** *Alnus rubra* Bong., red alder — frequent in DECID, occasional in ABPR.
Alnus sinuata (Regel) Rydb., Sitka alder — abundant in AV; locally frequent in WET; occasional in DECID; infrequent in ABPR, MUD, and CC.
Corylus cornuta Marsh var. *californica* (DC.) Sharp, California hazel — occasional in ROCK.
- Campanulaceae** *Campanula rotundifolia* L., American harebell — infrequent in ROCK.
Campanula scouleri Hook., Scouler bellflower — abundant in CC.
- Caprifoliaceae** *Linnaea borealis* L., twinflower — frequent in ABPR, occasional in TSHE.
Sambucus cerulea Raf., blue elderberry — occasional in CC.
Sambucus racemosa L. var. *arborescens* (T. & G.) Gray, red elderberry — infrequent to occasional in ROCK.
Viburnum edule (Michx.) Raf., high-bush cranberry — infrequent in DECID and outer margins of WET.
- Caryophyllaceae** *Arenaria capillaris* Poir. var. *americana* (Mag.) Davis, fescue sandwort — occasional in ROCK.
Arenaria macrophylla Hook., bigleaf sandwort — occasional in ROCK.
Stellaria calycantha (Ledeb.) Bong. var. *sitchana* (Steud.) Fern., northern starwort — occasional along streams in MUD.
- Celastraceae** *Pachistima myrsinites* (Pursh) Raf., Oregon boxwood — infrequent in ABPR, MUD, and ROCK; frequent in CC.

- Compositae (Asteraceae)** *Achillea millefolium* L. ssp. *lanulosa* (Nutt.) Piper, western yarrow — infrequent to locally frequent in ROCK, AV, and MUD.
- Adenocaulon bicolor* Hook., trail plant — occasional in ABPR, infrequent in TSHE.
- Anaphalis margaritacea* (L.) B. & H., pearly everlasting — occasional in ABPR and MUD, abundant in CC.
- Antennaria racemosa* Hook., slender everlasting — occasional in ROCK.
- Arnica latifolia* Bong. var. *gracilis* (Rydb.) Cronq., broadleaf or mountain arnica — occasional in ROCK, infrequent in open areas in TSHE.
- Aster ledophyllus* Gray, Cascades aster — infrequent in TSHE.
- Aster modestus* Lindl. in Hook., few-flowered or great northern aster — infrequent in WET.
- Chrysanthemum leucanthemum* L., marguerite, oxeye-daisy or moon-daisy — frequent in CC.
- Cirsium arvense* (L.) Scop. var. *horridum* Wimm. & Grab., Canadian thistle — occasional in CC, infrequent in WET.
- Cirsium edule* Nutt., Indian thistle — occasional in WET, infrequent along streams in MUD.
- Cirsium vulgare* (Savi) Tenore, common or bull thistle — occasional in CC.
- Erigeron peregrinus* (Pursh) Greene ssp. *callianthemus* (Greene) Cronq., peregrine fleabane — occasional in ROCK (S & C 557).
- Eriophyllum lanatum* (Pursh) Forbes, common woolly sunflower — infrequent along streams in MUD.
- Gnaphalium microcephalum* Nutt. var. *thermale* (E. Nels.) Cronq., slender or white cudweed — infrequent in CC.
- Hieracium cynoglossoides* Arv.-Touv., houndstongue hawkweed — infrequent in ROCK.
- Hieracium albiflorum* Hook., white hawkweed — frequent in CC; occasional in ABPR, MUD, TSHE, and ROCK.
- Hypochaeris radicata* L., spotted catsear — abundant in CC.
- Senecio jacobaea* L., tansy ragwort — occasional in CC, infrequent in TSHE and MUD.
- Senecio pseudoaureus* Rydb., streambank butterweed — frequent in WET.
- Taraxacum* sp., dandelion — rare in WET.

Cornaceae

- Cornus canadensis* L., bunchberry or Canadian dogwood — abundant in ABPR and DECID, frequent in TSHE, occasional in CC.
- Cornus stolonifera* Michx. var. *occidentalis* (T. & G.) Hitchc., red-osier dogwood — infrequent along outer margins of WET.

- Crassulaceae** *Sedum* sp., stonecrop — rare to infrequent in ROCK.
- Cupressaceae** *Juniperus communis* L. var. *montana* Ait., common or mountain juniper — frequent in ROCK.
Thuja plicata Donn, western redcedar — occasional in DECID.
- Cyperaceae** *Carex arcta* Boott, northern clustered sedge — occasional in WET (S & C 576).
Carex canescens Bailey, gray sedge — occasional in WET.
Carex deweyana Schw., Dewey sedge — occasional in DECID and CC (S & C 579).
Carex geyeri Boott, elk sedge — occasional in ROCK.
Carex laeviculmis Meinsh., smooth-stem sedge — occasional in WET, infrequent along streams in MUD (S & C 581).
Carex lenticularis Michx., Kellogg's sedge — occasional in WET (S & C 575).
Carex leptalea Wahl., bristle-stalked sedge — infrequent in WET (S & C 584).
Carex limnophila Hermann, pondsedge — occasional along streams in MUD (S & C 585).
Carex limosa L., mud sedge — infrequent in WET (S & C 586).
Carex livida (Wahl.) Willd., pale sedge — infrequent in WET (S & C 587).
Carex luzulina Olney, luzula-like sedge — occasional in WET (S & C 588).
Carex mertensii Prescott, Mertens sedge — infrequent in moist areas in TSHE and MUD.
Carex muricata L., western stellate sedge — occasional in WET (S & C 590).
Carex pennsylvanica Lam. var. *vespertina* L. H. Bailey, long-stoloned sedge — infrequent in open areas in TSHE.
Carex rossii Boott, Ross sedge — occasional in ROCK, AV, and along streams in MUD.
Carex rostrata Stokes ex With., beaked sedge — frequent in WET.
Carex sitchensis Prescott, Sitka sedge — frequent to locally abundant in WET.
Carex vesicaria L., inflated sedge — infrequent in WET (S & C 597).
Eleocharis pauciflora (Lightf.) Link, few-flowered spikesedge — occasional to locally abundant in WET.
Eriophorum polystachion L., tall cotton-grass — frequent to locally abundant in WET.
Scirpus microcarpus Presl, paniced bulrush — occasional along outer margins of WET, infrequent along streams in TSHE and DECID.
- Droseraceae** *Drosera anglica* Huds., great sundew — infrequent in WET.
Drosera rotundifolia L., sundew — infrequent in WET.

Equisetaceae

Equisetum palustre L., marsh horsetail — frequent in WET.

Equisetum fluviatile L., water horsetail — occasional in WET.

Ericaceae

Arctostaphylos nevadensis Gray, pine-mat manzanita — frequent in ROCK, occasional in MUD, infrequent in CC.

Arctostaphylos uva-ursi (L.) Spreng., kinnikinnick — frequent in MUD, infrequent in ROCK.

Chimaphila menziesii (R. Br.) Spreng., little prince's pine — infrequent in TSHE and ABPR.

Chimaphila umbellata (L.) Bart. var. *occidentalis* (Rydb.) Blake, western prince's pine — frequent in TSHE and ABPR, occasional in moist areas in MUD, infrequent in ROCK.

Gaultheria ovatifolia Gray, slender gaultheria — infrequent in MUD and ROCK.

Hypopitys monotropa Crantz, fringed pinesap — rare to infrequent in TSHE.

Kalmia occidentalis Small, bog laurel or kalmia — rare to infrequent in WET.

Menziesia ferruginea Smith, fool's huckleberry or rustyleaf — occasional in ROCK and DECID, infrequent in TSHE.

Phylodoce empetriformis (S.W.) D. Don, red mountainheather — infrequent in ROCK.

Phylodoce glanduliflora (Hook.) Cov., cream mountainheather or white heather — rare to infrequent in ROCK.

Pterospora andromedea Nutt., pine drops — rare to infrequent in MUD and TSHE.

Pyrola asarifolia Michx., large pyrola — infrequent along streams in MUD.

Pyrola picta Smith, whitevein pyrola — infrequent in moist areas in MUD, rare in ROCK.

Pyrola secunda L., one-sided wintergreen — occasional in TSHE, infrequent in ABPR, and moist areas in MUD.

Rhododendron albiflorum Hook., Cascades azalea — occasional in ROCK.

Vaccinium alaskaense Howell, Alaska huckleberry — occasional in TSHE.

Vaccinium deliciosum Piper, blueleaf huckleberry — infrequent in moist areas in ROCK.

Vaccinium membranaceum Dougl. ex Hook., big huckleberry — frequent in TSHE, occasional in ABPR and ROCK, occasional in moist areas in MUD.

Vaccinium occidentale Gray, westernbog huckleberry — frequent in WET.

Vaccinium ovalifolium Smith, ovalleaf huckleberry — frequent in TSHE, ABPR, DECID, and moist areas in MUD.

Vaccinium oxycoccus L., wild or swamp cranberry — infrequent in WET.

Vaccinium parvifolium Smith, red huckleberry — occasional in DECID, infrequent in moist areas in MUD.

Fumariaceae

Dicentra formosa (Andr.) Walp., Pacific bleedingheart — infrequent in moist areas in ROCK.

Gramineae (Poaceae)

Agrostis alba L. var. *stolonifera* (L.) Smith, fiorin — occasional in CC.

Agrostis diegoensis Vasey, thin bentgrass — collected in ROCK and CC (S & C 524).

Agrostis exarata Trin., spike bentgrass — infrequent in WET.

Agrostis idahoensis Nash, Idaho bentgrass — collected in WET (S & C 507).

Agrostis oregonensis Vasey, Oregon bentgrass — collected in WET (S & C 508).

Agrostis scabra Willd., winter bentgrass — collected in moist areas in MUD (S & C 512).

Anthoxanthum odoratum L., sweet vernalgrass — occasional in CC.

Bromus vulgaris (Hook.) Shear, Columbia brome — collected in CC (S & C 500).

Calamagrostis canadensis (Michx.) Beauv., bluejoint reedgrass — frequent in WET.

Calamagrostis sesquiflora (Trin.) Kawano, one-and-half-flowered reedgrass — collected in ROCK (S & C 517).

Cinna latifolia (Trevir.) Griseb., woodreed grass — frequent along streams in MUD (S & C 516).

Dactylis glomerata L., orchardgrass — abundant in CC, infrequent in ABPR.

Danthonia intermedia Vasey, timber danthonia — infrequent in ROCK (S & C 518).

Deschampsia elongata (Hook.) Munro ex Benth., slender hairgrass — occasional to frequent in CC and along streams in MUD (S & C 523).

Festuca idahoensis Elm., Idaho fescue — collected in moist areas in ROCK (S & C 513).

Glyceria elata (Nash) M. E. Jones, tall mannagrass — occasional to locally frequent in WET.

Glyceria leptostachya Buckl., slender-spike mannagrass — infrequent in WET.

Holcus lanatus L., common velvetgrass — occasional in CC.

Lolium perenne L., perennial ryegrass — rare in CC.

Poa cusickii Vasey var. *epilis* (Scribn.) Hitchc., skyline bluegrass — collected in ROCK (S & C 505).

Poa marcida Hitchc., withered bluegrass — collected in TSHE (S & C 511).

Poa pratensis L., Kentucky bluegrass — infrequent in CC.

Puccinellia pauciflora (Presl) Munz, weak alkaligrass — occasional in WET.

Trisetum canescens Buckl., tall trisetum — frequent along streams in MUD (S & C 522).

Trisetum cernuum Trin., nodding trisetum — collected along streams in MUD (S & C 522).

Trisetum spicatum (L.) Richter, downy oatgrass — infrequent in ROCK.

Grossulariaceae

Ribes bracteosum Dougl., stink currant — occasional in AV, DECID, and along streams in MUD; rare to infrequent at outer margins of WET.

Ribes howellii Greene, mapleleaf currant — infrequent in ROCK.

Ribes lacustre (Pers.) Poir., prickly currant — occasional in DECID; infrequent in ABPR, TSHE, and moist areas in MUD.

Hydrophyllaceae

Hydrophyllum tenuipes Heller, Pacific waterleaf — infrequent in AV and outer margins in WET.

Phacelia nemoralis Greene ssp. *oregonensis* Heckard, woodland or shade phacelia — infrequent in open areas in AV.

Phacelia sp., phacelia — occasional in CC.

Hypericaceae

Hypericum anagalloides C. & S., bog St. Johnswort — occasional in WET.

Juncaceae

Juncus drummondii E. Meyer var. *subtriflorus* (E. Meyer) Hitchc., Drummond rush — occasional along streams in MUD.

Juncus effusus L. var. *gracilis* Hook., common rush — occasional in WET.

Juncus ensifolius Wikst. var. *ensifolius*, sword-leaved rush — infrequent in WET.

Juncus ensifolius Wikst. var. *montanus* (Engelm.) Hitchc., dagger-leaved rush — occasional in WET.

Juncus mertensianus Bong., Mertens rush — collected along stream in MUD (S & C 570).

Juncus parryi Engelm., Parry's rush — occasional in ROCK and along streams in MUD.

Luzula campestris (L.) DC. var. *multiflora* (Ehrh.) Celak., many-flowered field woodrush — occasional in CC; infrequent in ABPR, TSHE, and ROCK.

Luzula divaricata Wats., spreading woodrush — abundant in CC, occasional along streams in MUD and TSHE, infrequent in ABPR.

Luzula parviflora (Ehrh.) Desv., millet woodrush — frequent in CC, occasional along streams in MUD.

Labiatae (Lamiaceae)

Stachys cooleyae Heller, Cooley's hedge nettle — occasional in DECID and along lake margins.

Leguminosae (Fabaceae)

Hedysarum occidentale Greene, western hedysarum — occasional in ROCK (S & C 572).

Lupinus latifolius Agardh, broadleaf lupine — frequent in MUD, infrequent in ABPR.

Lupinus wyethii Wats., Wyeth's lupine — occasional in ROCK.

Liliaceae

Calochortus subalpinus Piper, mountain mariposa — occasional in ROCK.

Clintonia uniflora (Schult.) Kunth., queencup beadlily — frequent in TSHE and DECID, occasional in ABPR and moist areas in MUD.

Disporum hookeri (Torr.) Nicholson var. *oreganum* (Wats.) Jones, Hooker's fairybells — infrequent in AV.

Disporum smithii (Hook.) Piper, Smith's fairybells — occasional in ABPR, infrequent in TSHE.

Erythronium montanum Wats., avalanche fawnlily — occasional in ROCK, infrequent in TSHE and outer margins in AV.

Lilium columbianum Hanson, Columbia or tiger lily — occasional in ROCK.

Maianthemum dilatatum (Wood) Nels. & Macbr., false lily-of-the-valley — frequent in DECID, occasional in ABPR, infrequent in TSHE.

Smilacina racemosa (L.) Desf., western Solomon's seal or false spikenard — infrequent in TSHE and ABPR.

Smilacina stellata (L.) Desf., starry solomonsplume — occasional in ABPR, TSHE, and DECID; infrequent in moist areas in MUD and along outer margins in WET.

Streptopus amplexifolius (L.) DC. var. *americanus* Schult., claspleaf twistedstalk — infrequent in moist areas in TSHE.

Streptopus roseus Michx. var. *curvipes* (Vail) Fassett, purple twistedstalk — occasional in DECID; infrequent in TSHE, ROCK, and CC.

Tofieldia glutinosa (Michx.) Pers. var. *brevistyla* Hitchc., western tofieldia — frequent to locally abundant in WET.

Trillium ovatum Pursh, white trillium — occasional to frequent in ABPR and DECID, infrequent in TSHE and in moist areas in MUD.

Veratrum viride Ait., American false hellebore — occasional in moist areas in ROCK and along outer margins in AV, infrequent in open areas in TSHE and DECID.

Xerophyllum tenax (Pursh) Nutt., common beargrass — frequent to locally abundant in ROCK, occasional in ABPR, infrequent in TSHE and moist areas in MUD.

Lycopodiaceae

Lycopodium clavatum L., runningpine clubmoss — infrequent in rocks in TSHE and in ROCK.

Menyanthaceae

Menyanthes trifoliata L., buckbean — infrequent in WET.

Nymphaeaceae

Nuphar polysepalum Engelm., spatterdock or Indian pond lily — frequent in lakes in WET.

Onagraceae

Circaea alpina L., enchanter's nightshade or alpine circaea — infrequent in DECID.

Epilobium alpinum L., alpine willowweed — occasional along streams in MUD.

Epilobium augustifolium L., fireweed — frequent in CC, occasional in ABPR.

Epilobium glandulosum Lehm., common willowweed — occasional along streams in MUD and in WET.

Epilobium luteum Pursh, yellow willowweed — occasional along streams in MUD.

Epilobium palustre L., swamp willowweed or wickup — occasional in WET.

Epilobium paniculatum Nutt., autumn willowweed — collected along streams in MUD (S & C 554).

Epilobium watsonii Barbey var. *occidentale* (Trel.) Hitchc., Watson's willowweed — frequent in CC and along streams in MUD.

Orchidaceae

Corallorhiza maculata Raf., spotted coralroot — infrequent in ABPR.

Corallorhiza mertensiana Bong., Mertens' coralroot — occasional in ABPR and TSHE.

Corallorhiza trifida Chat., early or yellow coralroot — occasional along streams in MUD, infrequent in ABPR.

Goodyera oblongifolia Raf., rattlesnake plantain — infrequent in TSHE, ABPR, and ROCK.

Habenaria dilatata (Pursh) Hook., boreal bogorchid — occasional in WET.

Habenaria saccata Greene, slender bogorchid — infrequent to occasional in WET, infrequent along streams in MUD.

Listera caurina Piper, western twayblade — rare in TSHE.

Listera cordata (L.) R. Br., northern listera — rare in TSHE and in moist areas in MUD.

Spiranthes romanzoffiana Cham., continental ladiestresses — rare to infrequent in WET.

Oxalidaceae

Oxalis oregana Nutt. ex T. & G., Oregon oxalis — frequent in ABPR, occasional in DECID.

Pinaceae

Abies amabilis (Dougl.) Forbes, Pacific silver fir — frequent to abundant in TSHE, frequent in DECID, occasional in ABPR.

Abies lasiocarpa (Hook.) Nutt., subalpine fir — occasional along Coldspring Creek in northeast corner of the Research Natural Area.

Abies procera Rehder, noble fir — abundant in ABPR, occasional in DECID and moist areas in MUD, occasional in CC, infrequent in TSHE.

Pinus contorta Dougl. var. *latifolia* Engelm., lodgepole pine — abundant in MUD, frequent in moist areas in MUD, infrequent in CC.

- Pinus monticola* Dougl. ex D. Don, western white pine — frequent in MUD, infrequent in TSHE.
- Pseudotsuga menziesii* (Mirbel) Franco, Douglas-fir — frequent in ABPR and CC, occasional in TSHE and moist areas in MUD, infrequent in MUD.
- Tsuga heterophylla* (Raf.) Sarg., western hemlock — abundant in TSHE and DECID, frequent in ABPR, occasional in moist areas in MUD.
- Tsuga mertensiana* (Bong.) Carr., mountain hemlock — occasional to locally frequent at high elevations.
- Plantaginaceae** *Plantago lanceolata* L., English plantain — occasional in CC.
- Polemoniaceae** *Phlox diffusa* Benth. var. *longistylis* (Wherry) Peck, spreading phlox — infrequent in ROCK.
- Polygonaceae** *Polygonum bistortoides* Pursh, American bistort — occasional in ROCK.
Rumex acetosella L., sheep sorrel — infrequent in ABPR and CC.
- Polypodiaceae** *Adiantum pedatum* L., western maidenhair-fern — infrequent in moist areas in ABPR.
Athyrium distentifolium Tausch var. *americanum* (Butters) Cronq., alpine ladyfern — locally frequent along outer margins of AV and ROCK.
Athyrium filix-femina (L.) Roth, ladyfern — in moist areas.
Blechnum spicant (L.) With., deerfern — infrequent in TSHE, ROCK, and DECID.
Cryptogramma crispera (L.) R. Br. ex Hook., parsley-fern — infrequent in ROCK.
Dryopteris expansa (Presl) Fraser-Jenkins & Jermy, mountain woodfern — not sighted in 1979 but previously reported in unpublished field notes.
Gymnocarpium dryopteris (L.) Newm., oakfern — occasional in ROCK, AV, and ABPR; infrequent in TSHE.
Polystichum munitum (Kaulf.) Presl, swordfern — infrequent to abundant, except in ROCK.
Pteridium aquilinum (L.) Kuhn., bracken fern — infrequent in ROCK and CC.
- Portulacaceae** *Lewisia columbiana* (Howell) Robins. var. *rupicola* (English) Hitchc., Columbia lewisia — infrequent to locally abundant in ROCK (S & C 574).
Montia parviflora (Mac.) Greene var. *flagellaris* (Bong.) Hitchc., streambank springbeauty — abundant along streams in MUD, frequent in DECID.
Montia sibirica (L.) Howell, western springbeauty — occasional in TSHE and ROCK.
- Primulaceae** *Trientalis arctica* Fisch., northern starflower — occasional in WET.

Ranunculaceae

Actaea rubra (Ait.) Willd., baneberry — infrequent in CC and in moist areas in MUD.

Anemone deltoidea Hook., threeleaf anemone — occasional in TSHE and DECID.

Coptis laciniata Gray, cutleaf goldthread — frequent in ABPR, occasional in DECID.

Ranunculus flammula L., smaller creeping buttercup — infrequent along lake margins in WET.

Ranunculus uncinatus D. Don, little buttercup — infrequent in TSHE and in moist areas in MUD.

Trautvetteria caroliniensis (Walt.) Vail., false bugbane — occasional in AV and TSHE.

Rosaceae

Amelanchier alnifolia Nutt., Saskatoon serviceberry — infrequent in ROCK.

Aruncus sylvestris Kostel., goatsbeard — infrequent in TSHE, AV, and ROCK.

Holodiscus discolor (Pursh) Maxim., creambush oceanspray — infrequent to occasional in ROCK and along streams in MUD.

Luetkea pectinata (Pursh) Kuntze, partridgefoot — infrequent in ROCK.

Potentilla palustris (L.) Scop., marsh cinquefoil — not sighted in 1979 but previously reported in unpublished field notes.

Rosa gymnocarpa Nutt., baldhip rose — frequent in CC; occasional in DECID; infrequent in TSHE, ABPR, and moist areas in MUD.

Rubus lasiococcus Gray, dwarf blackberry — frequent in TSHE; occasional in ABPR and CC; infrequent in DECID, ROCK, and moist places in MUD.

Rubus leucodermis Dougl., blackcap or black raspberry — infrequent in TSHE.

Rubus parviflorus Nutt., thimbleberry — occasional in CC and ROCK.

Rubus pedatus J. E. Smith, strawberry-leaf blackberry — occasional in TSHE and DECID.

Rubus spectabilis Pursh, salmonberry — frequent in TSHE and DECID; occasional in AV and along outer margins of WET.

Rubus ursinus Cham. & Schlecht., trailing blackberry — abundant in DECID; frequent in ABPR, TSHE, and CC.

Sorbus scopulina Greene var. *cascadensis* (Jones) Hitchc., Cascade mountain-ash — infrequent in ROCK.

Sorbus sitchensis Roemer var. *grayi* (Wenzig) Hitchc., Sitka or Pacific mountain-ash — infrequent in ROCK.

Spiraea densiflora Nutt., subalpine spirea — occasional in ROCK, infrequent in WET.

Spiraea douglasii Hook. var. *menziesii* (Hook.) Presl, Menzies spirea — infrequent in WET.

Rubiaceae

Galium aparine L., cleavers bedstraw — rare in MUD.

Galium oreganum Britt., Oregon bedstraw — infrequent in TSHE.

Galium trifidum L. var. *pacificum* Wieg., small bedstraw — occasional along streams in MUD.

Galium triflorum Michx., sweetscented bedstraw — infrequent in WET.

Salicaceae

Populus trichocarpa Torr. & Gray, black cottonwood — occasional in DECID.

Salix lasiandra Benth., red willow — infrequent in WET.

Salix pedicellaris Pursh, bog willow — occasional in WET (S & C 552).

Salix phylicifolia L. ssp. *planifolia* (Pursh) Hiitonen var. *pennata* (Ball) Cronq., tea-leaved willow — occasional in WET.

Salix sitchensis Sanson in Bong., Sitka willow — occasional in WET (S & C 564).

Saxifragaceae

Heuchera micrantha Dougl. var. *diversifolia* (Rydb.) R. B. & L., smallflowered alumroot — infrequent in ROCK (S & C 545).

Mitella breweri Gray, feathery mitrewort — infrequent in AV and DECID.

Mitella caulescens Nutt., leafy mitrewort — infrequent in DECID and along outer margins in WET.

Mitella pentandra Hook., fivepoint mitrewort — infrequent in DECID and TSHE.

Saxifraga ferruginea Grah. var. *macounii* Engl. & Irmsch., rusty saxifrage — infrequent to occasional in ROCK.

Tellima grandiflora (Pursh) Dougl., Alaska fringecup — infrequent in AV.

Tiarella trifoliata L. var. *trifoliata*, three-leaved coolwort — infrequent in TSHE.

Tiarella trifoliata L. var. *unifoliata* (Hook.) Kurtz., western coolwort or coolwort foamflower — abundant in DECID, frequent in TSHE and CC, infrequent in moist places in MUD.

Tolmiea menziesii (Pursh) T. & G., youth-on-age or pig-a-back plant — occasional in DECID, AV, and along streams in MUD.

Scrophulariaceae

Castilleja miniata Dougl., scarlet paintbrush — occasional in ROCK.

Mimulus guttatus DC., common monkeyflower — frequent along streams in MUD.

Mimulus lewisii Pursh, Lewis monkeyflower — frequent along streams in MUD.

Mimulus moschatus Dougl., muskflower — infrequent in WET.

Nothochelone nemorosa (Dougl.) Straw., woodland beard-tongue — occasional in ROCK, infrequent in TSHE, rare in ABPR and CC.

Pedicularis racemosa Dougl., leafy lousewort — infrequent to occasional in ROCK, TSHE, and ABPR.

Penstemon davidsonii Greene var. *menziesii* (Keck) Cronq., Davidson penstemon — frequent in CC.

Penstemon rupicola (Piper) Howell, cliff penstemon — rare in rocks in MUD.

Veronica americana Schwein., American brooklime — occasional along streams in MUD and WET.

Selaginellaceae

Selaginella wallacei Hieron., Wallace selaginella — rare in ROCK.

Sparganiaceae

Sparganium minimum Fries, small bur-reed — infrequent along outer margins of lakes in WET.

Taxaceae

Taxus brevifolia Nutt., western yew — infrequent in ROCK and TSHE, rare in CC.

Umbelliferae

Lomatium martindalei Coult. & Rose var. *angustum* Coult. & Rose, few-fruited lomatium — occasional in ROCK.

Osmorhiza purpurea (Coult. & Rose) Suksd., purple sweetroot — occasional in TSHE, DECID, and along streams in MUD.

Valerianaceae

Valeriana sitchensis Bong., Sitka valerian — occasional to frequent in ROCK.

Violaceae

Viola glabella Nutt., wood violet — frequent in ABPR and DECID, infrequent in ROCK and along streams in MUD, rare in WET.

Viola orbiculata Geyer, darkwoods vetch violet — occasional in ABPR, DECID, and TSHE (S & C 553).

Viola palustris L., marsh violet — infrequent along outer margins in WET.

The following list includes 259 plant taxa distributed among the 52 families listed above:

| Family | Number of taxa | Family | Number of taxa |
|------------------|----------------|------------------|----------------|
| Aceraceae | 2 | Liliaceae | 15 |
| Apocynaceae | 1 | Lycopodiaceae | 1 |
| Araliaceae | 1 | Menyanthaceae | 1 |
| Aristolochiaceae | 1 | Nymphaeaceae | 1 |
| Berberidaceae | 3 | Onagraceae | 8 |
| Betulaceae | 3 | Orchidaceae | 9 |
| Campanulaceae | 2 | Oxalidaceae | 1 |
| Caprifoliaceae | 4 | Pinaceae | 8 |
| Caryophyllaceae | 3 | Plantaginaceae | 1 |
| Celastraceae | 1 | Polemoniaceae | 1 |
| Compositae | 20 | Polygonaceae | 2 |
| Cornaceae | 2 | Polypodiaceae | 9 |
| Crassulaceae | 1 | Portulacaceae | 3 |
| Cupressaceae | 2 | Primulaceae | 1 |
| Cyperaceae | 21 | Ranunculaceae | 6 |
| Droseraceae | 2 | Rosaceae | 16 |
| Equisetaceae | 2 | Rubiaceae | 4 |
| Ericaceae | 22 | Salicaceae | 5 |
| Fumariaceae | 1 | Saxifragaceae | 9 |
| Gramineae | 26 | Scrophulariaceae | 9 |
| Grossulariaceae | 3 | Selaginellaceae | 1 |
| Hydrophyllaceae | 3 | Sparganiaceae | 1 |
| Hypericaceae | 1 | Taxaceae | 1 |
| Juncaceae | 9 | Umbelliferae | 2 |
| Labiatae | 1 | Valerianaceae | 1 |
| Leguminosae | 3 | Violaceae | 3 |

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