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# Saddle Bag Mountain Research Natural Area

## Guidebook Supplement 34

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The PNW Research Station is publishing this guidebook as part of a continuing series of guidebooks on federal research natural areas begun in 1972.

**Cover**

Mixed western hemlock (*Tsuga heterophylla*) (foreground) and Pacific silver fir (*Abies amabilis*) (scattered in background) forest over 350 years old at Saddle Bag Mountain RNA. Reproduction is patchy and mixed between western hemlock and Pacific silver fir. Understory in openings is characterized by Oregon oxalis (*Oxalis oregana*), cut-leaf goldthread (*Coptis laciniata*), mountain sweet-cicely (*Osmorhiza berteroi*), and threeleaf foamflower (*Tiarella trifoliata*).

## Abstract

**Schuller, Reid; Exeter, Ronald L. 2007.** Saddle Bag Mountain Research Natural Area: guidebook supplement 34. Gen. Tech. Rep. PNW-GTR-731. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 22 p.

This guidebook describes the Saddle Bag Mountain Research Natural Area, a 121-ha (300-ac) tract established to represent an old-growth remnant of Pacific silver fir (*Abies amabilis*) and western hemlock (*Tsuga heterophylla*) forest in the Oregon Coast Range. Pacific silver fir and noble fir (*Abies procera*) occur as isolated remnants, and both species are approaching the southern limits of their natural range in the Oregon Coast Range.

Keywords: Research natural area, old-growth forest, Pacific silver fir forest, western hemlock forest, noble fir forest, Douglas-fir forest, Oregon Coast Range, remnant population.

## Preface

The research natural area (RNA) described in this supplement[1] is administered by the Bureau of Land Management (BLM), U.S. Department of the Interior. The BLM Salem District office has RNA program administrative responsibility, and the Marys Peak Resource Area has on-the-ground management responsibility for the RNA. Scientists and educators wishing to visit or use the RNA for scientific or educational purposes should contact the resource area field manager in advance and provide information about research or educational objectives, sampling procedures, and other prospective activities. Research projects, educational visits, and collection of specimens from the RNA all require prior approval. There may be limitations on research or educational activities.

Saddle Bag Mountain RNA is part of a federal system of such tracts established for research and educational purposes. Each RNA is a site where natural features are protected or managed for scientific purposes and natural processes are allowed to dominate. Their main purposes are to provide:

- Baseline areas against which effects of human activities can be measured or compared.
- Sites for study of natural processes in undisturbed ecosystems.
- Gene pool preserves for all types of organisms, especially rare and endangered types.

The federal system is outlined in *A Directory of the Research Natural Areas on Federal Lands of the United States of America*.[2]

Of the 96 federal RNAs established in Oregon and Washington, 45 are described in Federal Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators (see footnote 1). Supplements to the guidebook such as this publication constitute additions to the system.

The guiding principle in management of RNAs is to prevent unnatural encroachments or activities that directly or indirectly modify ecological processes or conditions. Logging and uncontrolled grazing are not allowed, for example, nor is public use that might impair scientific or educational values. Management practices necessary to maintain or restore ecosystems may be allowed.

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[1] Supplement No. 34 to Franklin, J.F.; Hall, F.C.; Dyrness, C.T.; Maser, C. 1972. Federal research natural areas in Oregon and Washington: a guidebook for scientists and educators. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 498 p.

[2] Federal Committee on Ecological Reserves. 1977. A directory of the research natural areas on federal lands of the United States of America. Washington, DC: U.S. Department of Agriculture, Forest Service. [Irregular pagination].

Federal RNAs provide a unique system of publicly owned and protected examples of undisturbed ecosystems where scientists can conduct research with minimal interference and reasonable assurance that investments in long-term studies will not be lost to logging, land development, or similar activities. In return, a scientist wishing to use an RNA is obligated to:

- Obtain permission from the appropriate administering agency before using the area.[3]
- Abide by the administering agency's regulations governing use, including specific limitations on the type of research, sampling methods, and other procedures.
- Inform the administering agency on progress of the research, published results, and disposition of collected materials.

The purpose of these limitations is to:

- Ensure that the scientific and educational values of the tract are not impaired.
- Accumulate a documented body of knowledge and information about the tract.
- Avoid conflict between studies and activities.

Research must be essentially nondestructive; destructive analysis of vegetation is generally not allowed, nor are studies requiring extensive modification of the forest floor or extensive excavation of soil. Collection of plant and animal specimens should be restricted to the minimum necessary to provide voucher specimens and other research needs. Under no circumstances may collecting significantly reduce populations of species. Collecting also must be carried out in accordance with agency regulations. Within these broad guidelines, appropriate uses of RNAs are determined by the administering agency.

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[3] Six federal agencies cooperate in this program in the Pacific Northwest: U.S. Department of the Interior, Bureau of Land Management, Fish and Wildlife Service, and National Park Service; U.S. Department of Agriculture, Forest Service; U.S. Department of Energy; and U.S. Department of Defense.

Salem BLM management direction is to preserve, protect, or restore native species composition and ecological processes of biological communities (including terrestrial and aquatic cells[4] listed in the 2003 Oregon Natural Heritage Plan). These RNAs are available for short- or long-term scientific study, research, and education and will serve as a baseline against which human impacts on natural systems can be measured. The Marys Peak Resource Area does not issue special forest product permits within RNAs.

[4] Cells are the basic units that must be represented in a natural area system. A cell can be an ecosystem, community, habitat, or organism. Taken from: Dyrness, C.T.; Franklin, J.F.; Maser, C.; Cook, S.A.; Hall, J.D.; Faxon, G. 1975. Research natural area needs in the Pacific Northwest: a contribution to land-use planning. Gen. Tech. Rep. PNW-GTR-38. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 231 p.

## Contents

## Introduction

Saddle Bag Mountain Research Natural Area (RNA) is a 122-ha (300-ac)[1] tract of land occupying the summit and western slopes of Saddle Bag Mountain located in Lincoln County. Saddle Bag Mountain was established to protect one of the last remaining stands of Pacific silver fir (*Abies amabilis*) (see app. 1 for species names and authorities) in the Oregon coastal mountains (Dyrness et al. 1975, Oregon Natural Heritage Program 2003). This RNA is near the southern end of Pacific silver fir's distribution in the Oregon Coast Range. Populations of both Pacific silver fir and noble fir (*Abies procera*) have been isolated on and near Saddle Bag Mountain for hundreds of years, and both species may represent genetically unique populations owing to their long period of isolation (Elliott et al. 1986, Federal Register 1984, Hines 1971, McCain and Diaz 2002).

Saddle Bag Mountain RNA consists of many trees 250 to 400 years old that are distributed mainly on the upper slopes and widely scattered on the lower slopes. Otherwise, the majority of trees in the Saddle Bag Mountain RNA are greater than 160 years in age.

Saddle Bag Mountain was established in 1983 as an RNA under the Salem Management Framework Plan (Federal Register 1984). The RNA is administered by the Salem District Bureau of Land Management (BLM) and managed as part of the Marys Peak Resource Area.

## Access and Accommodations

Vehicle access is through gated, private lumber company roads. Permission is required to cross these lands. Please contact the Salem BLM, Marys Peak Resource Area for access information and to obtain permission to use the area.

From the town site of Grande Ronde, Oregon, travel west on Highway 18 to the Murphy Grade road located west of milepost 17, and turn south (locked gate). Murphy Grade road (also known as the "100 road") is located just west of the green Murphy summit road sign and where two westbound lanes merge into one. Proceed on the 100 road (portions are also known as "road 6") past the junction of the 300 road at 7.5 mi (12 km). At 7.9 mi (12.7 km), turn right on the 200 road, then right onto road 210 (fig. 1). Proceed to a "T" junction with road 230 at 9.3 mi (15 km). Turn right onto road 230, then left onto road 235 (BLM road 7-9-3) and continue approximately 0.3 mi (0.5 km) to an old road junction on the right and culvert

[1] As of this writing, 62-ha (153.4-ac) has been designated as the Saddle Bag Mountain RNA. An additional 59.4-ha (146.7-ac) parcel is currently proposed for inclusion to the existing RNA. The combined 121.5-ha (300.1-ac) area is treated in this report.

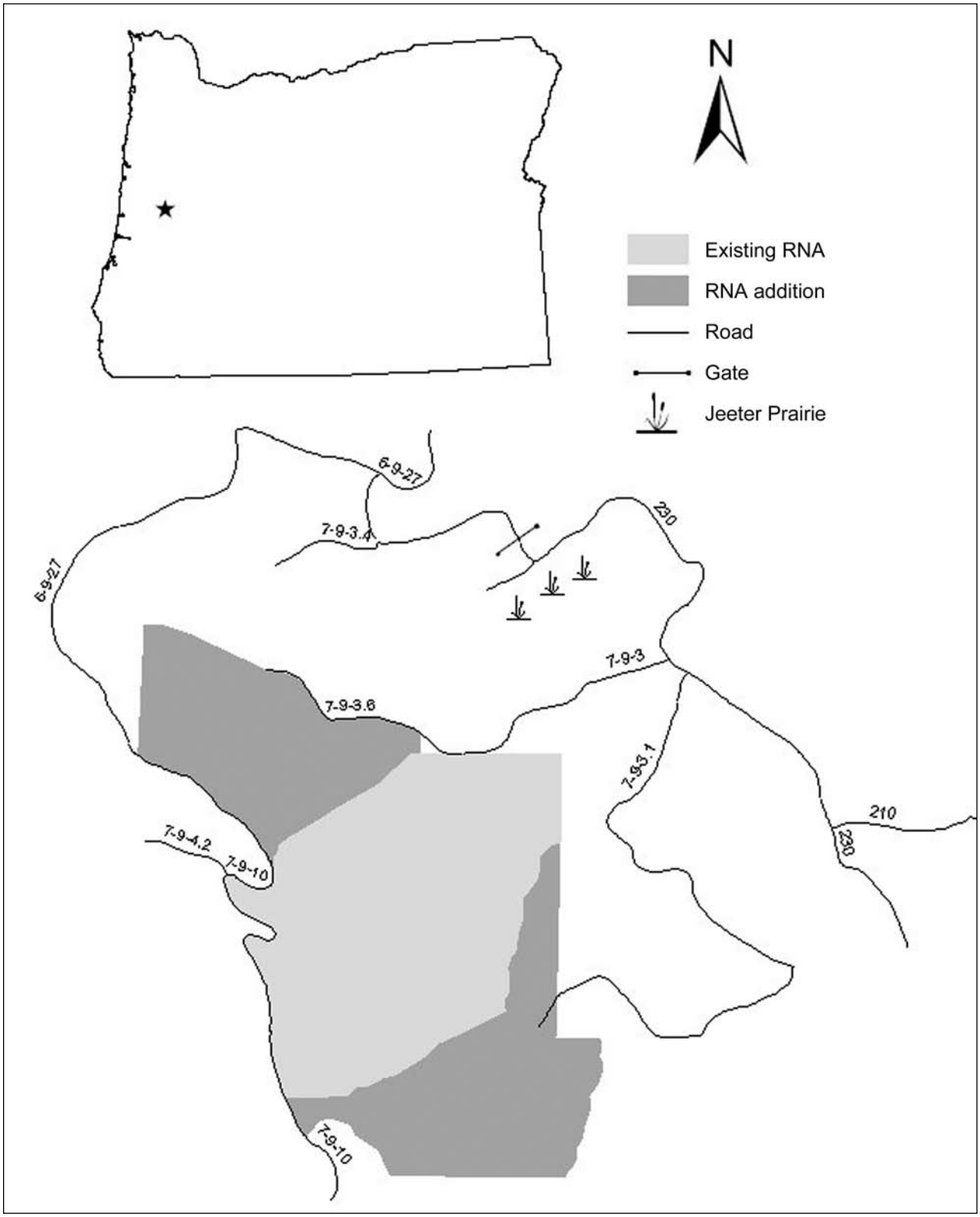


Figure 1—Saddle Bag Mountain Research Natural Area location and access.

crossing on road 235. Park here for access into the northern portion of Saddleback Mountain RNA. Gates may be locked at any time.

There are no developed trails within Saddle Bag Mountain RNA. Cross-country foot travel can be difficult owing to steep slopes, loose soils, and downed trees. Lodging accommodation is available in Grande Ronde, Lincoln City, and Salem, Oregon.

## Environment

The summit of Saddle Bag Mountain is capped by a gabbroic sill, which is part of a thick and widespread intrusion forming a plateau between Fanno Ridge, Laurel Mountain, Saddle Bag Mountain, and Stott Mountain. This rock cap is more resistant to weathering and erosion than surrounding sedimentary rocks. Resistance to erosion on Saddle Bag Mountain and the other peaks in the northern Oregon Coast Range has resulted in peaks retaining their elevations in relation to the surrounding landscape (Baldwin 1947).

Elevations range from 642 m (2,106 ft) in the southwest corner of the RNA to 1024 m (3,359 ft) on the Saddle Bag Mountain ridgeline located in the north-central portion of the tract (fig. 2). Ridges and upper slopes located in the northeastern portion of Saddlebag are gently inclined and provide a full range of slope exposures. Otherwise, the southwest and western slopes of Saddle Bag Mountain are very steep.

Eighty percent of Saddle Bag Mountain RNA has been mapped as Caterl-Laderly gravelly loams, with 30- to 65-percent slopes. This mapping unit contains soils that are deep and well drained and have formed in colluvium derived from volcanic material. The surface layer is dark brown to very dark brown gravelly loam about 46 cm thick. The subsoil is very dark brown extremely gravelly loam about 30 cm thick. Fractured igneous bedrock occurs at a depth of about 76 cm. The taxonomic classification of this complex is medial-skeletal, frigid Alic Hapludands (Shipman 1997, USDA NRCS 2006).

The remaining 20 percent of Saddle Bag Mountain RNA has been mapped as Valsetz-Yellowstone complex with slope steepness ranging between 3 and 60 percent. Valsetz soil is moderately deep and well drained and formed in colluvium derived from volcanic material. The surface layer is brown cobbly loam about 13 cm thick. The upper part of the subsurface is reddish-brown very cobbly loam about 23 cm thick, and the lower part is brown and strongly brown extremely cobbly loam about 56 cm thick. Fractured basic igneous rock is at a depth of about 91 cm. The Valsetz component of this complex is classified as medial-skeletal, frigid Typic Haplocryands (Shipman 1997, USDA-NRCS 2006).

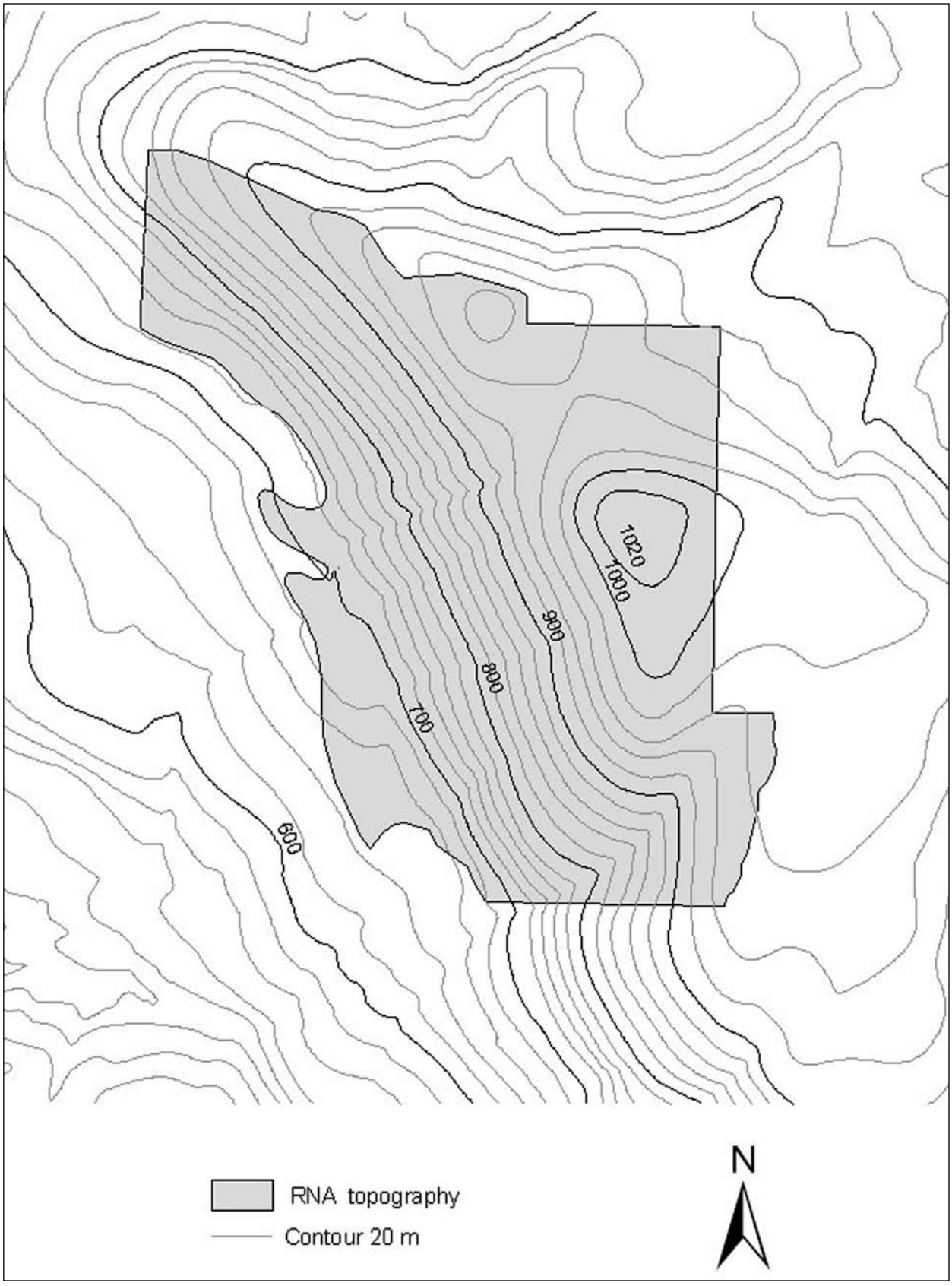


Figure 2—Saddle Bag Mountain Research Natural Area boundary and topography.

Yellowstone soil is shallow and very well drained. The surface layer is dark reddish-brown stony cobbly loam about 25 cm thick. The subsurface is dark reddish-brown extremely cobbly loam about 20 cm thick. Fractured basic igneous rock occurs at a depth of about 45 cm (USDA NRCS 2006). The Yellowstone component of this complex is classified as medial-skeletal, frigid Lithic Haplocryands (Shipman 1997, USDA NRCS 2006).

Although the soil complexes (Caterl-Laderly gravelly loams and Valsetz-Yellowstone complex) that have been mapped at Saddle Bag Mountain were described as occurring on up to 60- to 65-percent slopes, the western slopes on Saddle Bag Mountain often exceed 80 percent.

## Climate

Saddle Bag Mountain RNA lies predominantly within the *Tsuga heterophylla* zone described by Franklin and Dyrness (1988). The upper 162 to 243 m (400 to 600 ft) lies within the *Abies amabilis* zone (Franklin and Dyrness 1988). The climate is strongly maritime, owing to its proximity to the Pacific Ocean. Summers are usually moderately dry and warm with the June–August period receiving about 5 percent of the total annual precipitation. Fall, winter, and spring are typically cool and wet. The majority of precipitation occurs during the November-March period, mostly in the form of rain at lower elevations with an increasing proportion of snow at upper elevations.

For the 1978–2005 period, snowfall occurred from October through May. The highest monthly snowfall averages were between December and March. January received the highest average monthly snowfall of 59 cm. Average monthly maximum snow depths of 25.4 cm occurred in January. Average monthly snow depth in excess of 5.1 cm occurred from November through April. Microclimatic conditions differ significantly with elevation, slope, and aspect.

Meteorological data are taken from Laurel Mountain (station 354776), the nearest climate station of comparable elevation in the Oregon Coast Range, (Western Regional Climate Center 2006). The Laurel Mountain station is on the mountain summit at 1334 m (3,589 ft) elevation. Saddle Bag Mountain summit is 1322 m (3,359 ft) elevation. The climate station at Laurel Mountain is approximately 18.8 km (11.7 mi) southeast of the Saddle Bag Mountain summit.

**Period of Record: 3/1/1978 to 9/30/2005—Laurel Mountain, Oregon (354776)**

| | |
|---|---|
| Average minimum January temperature | -0.8 °C (30.5 °F) |
| Average maximum January temperature | 4.4 °C (40.0 °F) |
| Average minimum July temperature | 9.3 °C (48.7 °F) |
| Average maximum July temperature | 18.7 °C (65.6 °F) |
| Average annual precipitation | 3132 mm (123.30 in) |
| Average June–August precipitation | 160 mm (6.30 in) |
| Average annual snowfall | 2995 mm (117.9 in) |

## Vegetation

**Western hemlock dominates western slopes.**

Ridges and upper elevations of Saddle Bag Mountain are codominated by Pacific silver fir and western hemlock interspersed with pockets of Douglas-fir and noble fir. The majority of the western slopes are dominated by western hemlock with scattered old-growth Douglas-fir and Pacific silver fir. Although the BLM types the majority of the western slopes at Saddle Bag at 170+ years old (fig. 3), the dense smaller diameter western hemlocks are estimated to be less than 120 years old. This age-typing likely arises from the scattered remnant old-growth within these stands.

**Old-growth stand.**

The 12-ha (29-ac) old-growth stand located in a saddle north of the summit is an uneven-aged stand with patchy western hemlock and Pacific silver fir reproduction in the understory. The open nature of this stand indicates that either it was initially not very dense or that it has long since begun to disintegrate from the high winds that occur in the area. Various age classes of conifers in the forest understory can be correlated with the partial deterioration of the old-growth canopy over time (Elliott et al. 1986, McKee 1978). When individual old-growth trees die, and eventually fall to the ground, the resulting forest openings allow for establishment and growth of a new generation of young trees. This pattern repeated throughout the old-growth stand over a period of years could account for the varied age-class distribution of trees present on the site today.

Tree age data were collected in the old-growth stand from at least two dominant trees within each of four permanent plots established in 2006. Tree diameters at core height (about 1.4 m) and ages of nine western hemlocks indicate a multiaged stand with tree ages ranging from 263 to 375 years. Diameters at breast height (d.b.h.) ranged between 92 and 155 cm (36 and 61 in). The median d.b.h. and age for the group was 142 cm (56 in) and 340 years,[2] respectively. Age determinations

[2] Tree age was determined by counting growth rings and by estimating growth rings near the core center due to decay.


Figure 3—Stand age-class distribution in Saddle Bag Mountain Research Natural Area.

of overstory dominants represent approximations of actual tree ages. Ages were similarly estimated by Juday (1976) who found many trees to be approaching 400 years of age.

Tables 1 and 2 summarize the physical features, plant association, and understory composition and frequency of the four permanent plots. All four plots represent examples of the *Abies amabilis*/*Oxalis oregana* plant association (McCain and Diaz 2002). The plots are all located within a 12-ha (29-ac) area and differ from one another only slightly in elevation, slope position, and aspect. Midcanopy dominance

**Table 1—Physical features of three permanent plots in Saddle Bag Mountain Research Natural Area**

| | Plot | | | |
|---|---|---|---|---|
| **Physical features** | **103** | **109** | **110** | **111** |
| Elevation (m) | 949 | 952 | 965 | 957 |
| Aspect (°) | 69 | 98 | 52 | 350 |
| Slope grade (%)/(°) | 32/18 | 23/14 | 38/22 | 32/18 |
| Slope position | Mid | Mid | Mid | Mid |

**Table 2—Plant association, understory coverage, and frequency of four permanent plots in the Saddle Bag Mountain Research Natural Area**

| | Plot and plant association | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **108 ABAM/OXOR[a]** | | **109 ABAM/OXOR** | | **110 ABAM/OXOR** | | **111 ABAM/OXOR** | |
| **Species** | **Cover[b]** | **Frequency** | **Cover** | **Frequency** | **Cover** | **Frequency** | **Cover** | **Frequency** |
| | | | | *Percent* | | | | |
| Shrubs:[c] | | | | | | | | |
| *Vaccinium ovalifolium* | 11 | — | 4 | — | 4 | — | 3 | — |
| *Ribes lacustre* | tr | — | 3 | — | | — | 1 | — |
| *Rubus spectabilis* | tr | — | | — | | — | | — |
| Herbs and ferns: | | | | | | | | |
| *Oxalis oregana* | 8 | 32 | 26 | 82 | 11 | 54 | 21 | 68 |
| *Coptis laciniata* | 5 | 21 | 7 | 29 | 4 | 29 | 3 | 14 |
| *Tiarella trifoliata* | 1 | 18 | tr | 11 | 1 | 7 | tr | 21 |
| *Osmorhiza berteroi* | | | 3 | 36 | tr | 4 | 3 | 25 |
| *Viola sempervirens* | tr | 7 | tr | 7 | | | | |
| *Maianthemum dilatatum* | tr | 4 | 1 | 11 | | | | |
| *Trillium ovatum* | tr | 7 | | | | | 1 | 7 |
| *Viola glabella* | | | tr | 11 | | | | |
| *Claytonia sibirica* | | | 1 | 4 | | | tr | 18 |
| *Polystichum munitum* | | | tr | 18 | | | tr | 11 |
| *Mimulus dentatus* | | | tr | 4 | | | 2 | 7 |
| *Scoliopus hallii* | | | | | | | tr | 4 |

Note: ABAM = *Abies amabilis*, OXOR = *Oxalis oregana*, tr = trace (<0.5 percent foliar cover), - = not recorded.

[a] Plant association names all have a suffix, NWO Coast, that differentiates them from plant associations having similar names that occur in the Oregon Cascades sensu McCain and Diaz (2002).

[b] Cover is expressed as percentage of foliar cover; frequency is expressed as percentage of relative frequency. Zero values are not included.

[c] See appendix 1 for a listing of scientific and common names.

is shared between Pacific silver fir and western hemlock in two plots, and western hemlock predominates in two plots. Although patchy in distribution, western hemlock and Pacific silver fir have about equal densities of saplings and seedlings.

**Understory vegetation.**

The relatively open understory consists of a sparse shrub layer with early huckleberry (*Vaccinium ovalifolium*), swamp currant (*Ribes lacustre*), and salmonberry (*Rubus spectabilis*) being locally abundant, but patchy. Herbaceous species and mosses dominate the ground vegetation. Conspicuous herbs include Oregon oxalis (*Oxalis oregana*), cut-leaf goldthread (*Coptis laciniata*), mountain sweet-cicely (*Osmorhiza berteroi*), and threeleaf foamflower (*Tiarella trifoliata*).

Figure 4 shows an example of the understory conditions of the Pacific silver fir/Oregon oxalis (*Abies amabilis*/*Oxalis oregana*) plant association as seen from plot 108. Western hemlock and Pacific silver fir are major overstory dominants and are reproducing in the shaded understory as seedlings, saplings, and subcanopy individual trees. Early huckleberry ranges from 3 to 11 percent cover in the four

Figure 4—Dense reproduction of Pacific silver fir and western hemlock within the Pacific silver fir/Oregon oxalis plant association. Surface cover is predominantly seedlings and saplings with a sparse herbaceous cover.

plots. Oregon oxalis is the principal herbaceous species and ranges between 8 and 26 percent cover. Other typical herbaceous species include cut-leaf goldthread, mountain sweet-cicely, threeleaf foamflower, and western trillium (*Trillium ovatum*) (table 2).

Old-growth individuals of Douglas-fir are widely scattered as downed woody debris and wind-snapped snags throughout the stand. Figure 5 illustrates the size, position, and stage of decomposition of trees within the stand.

The ridgetop and upper northeastern slope of Saddle Bag Mountain support a stand of Pacific silver fir and noble fir over 250 years old. The area has a dense upper canopy and limited understory development. The majority of the mid and upper western part of Saddle Bag Mountain has a slope of over 80 percent and supports a dense forest stand of mostly western hemlock. Owing to the dense canopy of the western hemlock, there is little understory vegetation present except

Figure 5—Douglas-fir occurs as coarse woody debris on the forest floor. The forest canopy is dominated by western hemlock and Pacific silver fir amidst shade-tolerant seedlings, saplings, and midcanopy individuals of western hemlock and Pacific silver fir.

in the few forest canopy openings. These few openings mostly occur in areas with high water tables. The lower western slopes support a >160-year-old mixed stand dominated by western hemlock with Douglas-fir occurring as a minor species (Elliott et al. 1986) (see fig. 3).

## Fauna

Elk frequent Saddlebag Mountain and roam over 30 $mi^2$ of the Slick Rock-Warnick Creek watershed. The herd uses the RNA for thermal and escape cover. In 1986, the herd of 150 was determined to be increasing in size (Elliott et al. 1986).

Reptiles, amphibians, freshwater and anadromous fish, birds, and mammals known or expected to occur within the RNA are listed in appendix 2. These lists have been compiled from a combination of field observations and published literature. Taken together, they represent an informed approximation of species expected to occur within or use the RNA for portions of their life cycles (Csuti et al. 1997, USDI BLM 2006).

## Disturbance History

The forests of Saddle Bag Mountain are geographically and topographically predisposed to wind damage. This has been exacerbated by the pattern of timber harvesting to the north, east, and southwest of the RNA (Elliott et al. 1986, McKee 1978). Saddle Bag Mountain is 19.3 km (12 mi) inland from the Pacific Ocean, and its peak, rising 457 m (1,500 ft) above adjacent terrain, creates a protrusion causing vertical convergence of wind streamlines (Gratkowski 1956). Wind damage tends to be concentrated where winds are accelerated by topographic features such as saddles or gaps in ridgelines (Alexander 1964) and is generally highest on ridgetops and upper and middle slopes, especially where stands are situated on the leeward edge of a timber harvest unit (Ruth and Harris 1979).

**Wind as a major disturbance factor.**

A steady progression of windthrow and salvage tree cutting along the southwest boundary of Saddle Bag Mountain RNA has contributed to a rapidly disintegrating forest edge. Recent proposed additions to the RNA along the north, east, and south could ameliorate these ongoing effects in the future.

The Oregon Coast Range is characterized by a pattern of large-scale (some greater than 20,000 ac), infrequent (150- to 300-year mean fire-return interval) stand-replacement fires typical of cool moist climates where lightning is uncommon (Agee 1990). When lightning does occur, fire intensity is high allowing for extensive stand-destroying crown fires (Agee 1993). Large fires such as the 1933 Tillamook Fire are part of recent Oregon Coast Range fire history. Almost all coniferous forests within the *Tsuga heterophylla* zone (and by extension, those

few relict stands of Pacific silver fir in the contiguous *Abies amabilis* zone in the northern Oregon Coast Range) are first- or multigeneration stands originating from fire. In the absence of stand-destroying fire over hundreds of years, Douglas-fir will decline and western hemlock and Pacific silver fir will play an increasingly important role, especially in cool, mesic sites.

Juday (1976) examined Douglas-fir growth rings on stumps in a clearcut adjacent to the old-growth stand within Saddle Bag Mountain RNA and concluded that there had been no major disturbance (in the immediate vicinity) since approximately 1300. Hines (1971) surmised that the absence of Douglas-fir fire scars and charcoal in soil profiles on Saddle Bag Mountain may be attributed to the high rainfall on Saddle Bag Mountain. However, other locations on Saddle Bag Mountain have experienced wildfire in recent history (USDI BLM 2006).

## Research History

Macnab (1958) collected historical information on Saddle Bag Mountain. He collected detailed information on plant composition and forest structure in a 1.7-ha (4-ac) stand near the summit of Saddle Bag Mountain. Macnab (1958) also examined plant phenology and how it related to the seasonal patterns of activity by amphibians and insects. Hines (1971) collected data at Saddle Bag Mountain as part of his M.S. thesis, *Plant Communities in the Old-Growth Forests of North Coastal Oregon*. Juday (1976) collected vegetation data from the old-growth stand on Saddle Bag Mountain as part of his Ph.D. thesis, *The Location, Composition, and Structure of Old-Growth Forests of the Oregon Coast Range*. McKee (1978) prepared a report summarizing the biological merits of designating Saddle Bag Mountain as an RNA, which included an assessment of the ecological problems associated with windthrow and its current impacts and potential effects on the structural integrity of the old-growth stand at Saddle Bag Mountain.

Bauer et al. (1986) prepared *Monitoring and Management Proposals for Saddleback Mountain*.

Scofield (1991) conducted biological monitoring studies on *Scoliopus hallii* (1979–1984) and *Poa marcida* within the Saddle Bag Mountain RNA (Greene et al. 1986). Elliott et al. (1986) conducted a vegetation inventory and critical analysis assessment of the potential effects of windthrow at Saddle Bag Mountain.

**Monitoring plots established.**

Four permanent vegetation plots were established in 2006 to characterize and monitor change in forest composition and structure (the project is summarized, in part, in tables 1 and 2.) Data are on file at the Salem District office of the BLM, and the Pacific Northwest (PNW) Research Station, USDA Forest Service (USFS), Corvallis, Oregon.

## Site History

About 1900, the mail was delivered out of the Butler store in Grand Ronde. The mail route ran along the Salmon River and extended up onto Saddle Bag Mountain; but, as local residents were widely scattered, the letters were left in an old saddle bag that hung on a prominent snag. Mail service improved over the years and the saddle bag is long gone. After World War II, however, the name mysteriously changed to Saddleback Mountain. In 1980, William Erdmann of the Oregon Department of Forestry wrote to the Oregon Geographic Names Board (formerly Oregon Geographic Board) to provide the origin of the name of this high ground south of Salmon River between Otis and Grand Ronde. The U.S. Board on Geographic Names (formerly the U.S. Geographic Board) corrected the matter in Decision List 8104, and the name was changed back to Saddle Bag Mountain (McArthur and McArthur 2003).

Prior to 1910 the Saddle Bag Mountain area was visited by trappers and hunters. Few, if any permanent structures were erected in the area and no clearings were made in the Saddle Bag Mountain RNA. About 1910 the area was opened up to small timber claims, and many areas were cleared and cabins and barns were erected. In 1912, the small timber claims were abandoned and sold to large timber companies who closed many of the small roads accessing the area to reduce fire danger (Macnab 1958). Because access to Saddle Bag Mountain RNA has been restricted by private timber companies, public use has been limited. Most private timber lands surrounding Saddle Bag Mountain have been harvested in the past 20 years. Within Saddle Bag Mountain RNA, approximately 27 ha (67 ac) were harvested beginning in the early 1960s and continuing through the early 1980s.

## Maps and Aerial Photography

Maps applicable to Saddlebag Mountain RNA:

Topographic—Stott Mountain 7.5 minute 1:24,000 scale, 1984; BLM Salem District Westside Recreation Map 1:10,560, 1996.

Aerial photography—2003 color 1:12,000.

## Acknowledgments

We thank Sarah Greene, Claire Hibler, and Hugh Snook for assistance in the field, and Dave Calver for assistance in the field and creating maps for this publication. We also thank the Salem District, BLM for funding this project and the USFS PNW Research Station for publishing this supplement.

## English Equivalents

1 hectare (ha) = 2.47 acres (ac)
1 kilometer (km) = 0.62 miles (mi)
1 meter (m) = 3.28 feet (ft)
1 centimeter (cm) = 0.394 inch (in)
1 millimeter (mm) = 0.0394 inch

## References

**Agee, J.K. 1990.** The historical role of fire in Pacific Northwest forests. In: Walstad, J., Radosevich, S.; Sandberg, D., eds. Natural and prescribed fire in Pacific Northwest forests. Corvallis, OR: Oregon State University Press: 25–38.

**Agee, J.K. 1993.** Fire ecology of Pacific Northwest Forests. Washington, DC: Island Press. 493 p.

**Alexander, Robert. 1964.** Minimizing windfall around clear cuttings in spruce-fir forests. Forest Science. 2(1): 130–142.

**Baldwin, E.M. 1947.** Geology of the Dallas and Valsetz quadrangles, Oregon. Bulletin No. 35. Portland, OR. Oregon Department of Geology and Mineral Industries. 61 p.

**Bauer, P.; Brown, W.E.; Hukari, J.; Kuust, J.; Lira, E. 1986.** Monitoring and management proposals for Saddleback Mountain. Unpublished report on file with: Oregon State University, School of Forestry, Corvallis, OR 97331. [No pagination].

**Csuti, B.; Kimerling, A.J.; O'Neil, T.A.; Shaughnessy, M.M.; Gaines, E.P.; Huso, M.M.P. 1997.** Atlas of Oregon wildlife. Corvallis, OR: Oregon State University Press. 427 p. + map.

**Dyrness, C.T.; Franklin, J.F.; Maser, C.; Cook, S.A.; Hall, J.D.; Faxon, G. 1975.** Research natural area needs in the Pacific Northwest: a contribution to land-use planning. Gen. Tech. Rep. PNW-38. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 231 p.

**Elliott, L.; Keller, P.; Patton, C.; Rech, S.; Yeary, M. 1986.** A plan to manage and monitor two areas of critical environmental concern. Unpublished report on file with: Bureau of Land Management, Salem District Office, 1717 Fabry Road SE, Salem, OR 97306.

**Federal Register. 1984.** January 3, 1984, notices. Federal Register. 49(1): 165

**Flora of North America. 2006.** Partial nomenclature of vascular plants, ferns, and fern allies within Oregon. http://www.efloras.org/flora_page.aspx?flora_id=1. (November 3, 2006).

**Franklin, J.F.; Dyrness, C.T. 1988.** 2nd ed. Natural vegetation of Oregon and Washington. Corvallis, OR: Oregon State University Press. 452 p.

**Gratkowski, H.J. 1956.** Windthrow around staggered settings in old-growth Douglas-fir. Forest Science. 2(1): 60–74.

**Greene, S.E.; Blinn, T.; Franklin, J.F. 1986.** Research natural areas in Oregon and Washington: past and current research and related literature. Gen. Tech. Rep. PNW-GTR-197. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 115 p.

**Hines, W.W. 1971.** Plant communities in the old-growth forests of north coastal Oregon. Corvallis, OR: Oregon State University, Corvallis. 135 p. M.S. thesis.

**Juday, G.P. 1976.** The location, composition, and structure of old-growth forests of the Oregon Coast Range. Corvallis, OR: Oregon State University. 206 p. Ph.D. dissertation.

**Macnab, J.A. 1958.** Biotic aspection in the Coast Range mountains of northwestern Oregon. Ecological Monographs. 28(1): 21–54.

**McArthur, L.A. McArthur, L.L.; 2003.** Oregon geographic names, 7th ed. Portland, OR: Oregon Historical Society Press. 1,074 p.

**McCain, C.; Diaz, N. 2002.** Field guide to the forested plant associations of the northern Oregon Coast Range. Technical Paper R6-NR-ECOL-TP-02-02. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 250 p.

**McKee, A. 1978.** Proposed Saddleback Mountain Research Natural Area. Unpublished memo. On file with: USDI BLM Salem District Office, 1717 Fabry Road SE, Salem, OR 97306.

**Oregon Flora Project. 2006.** The Oregon plant atlas. http://www.oregonflora.org/oregonplantatlas.html. (September 22, 2006).

**Oregon Natural Heritage Program. 2003.** Oregon natural heritage plan. Salem, OR: Department of State Lands. 167 p.

**Ruth, R.; Harris, A.S. 1979.** Management of western hemlock-Sitka spruce forests for timber production. Gen. Tech. Rep. PNW-88. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 197 p.

**Scofield, L.R. 1991.** Biological monitoring studies on *Scoliopus hallii* (1979–1984) and *Poa marcida* (1987–1991). Unpublished field data and report. On file with: USDI BLM Salem District Office, 1717 Fabry Road SE, Salem, OR 97306.

**Shipman, J.A. 1997.** Soil survey of Lincoln County area. Newport, OR: USDA NRCS and USFS in cooperation with the Oregon Agricultural Experiment Station. 158 p.

**U.S. Department of Agriculture, Natural Resources Conservation Service [USDA NRCS]. 2006.** Soil maps from Lincoln County, Oregon. http://websoilsurvey.nrcs.usda.gov/app/. (December 28, 2006).

**U.S. Department of the Interior, Bureau of Land Management [USDI BLM]. 1996.** Research natural areas in Washington and Oregon. 2nd ed. BLM/OR/WA/PL-96/016+1792. Portland, Oregon. 74 p.

**U.S. Department of the Interior, Bureau of Land Management [USDI BLM]. 2006.** Forest inventory database. Unpublished report. On file with: Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306.

**Western Region Climate Center. 2006.** Oregon climate data. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?orfall. (December 10, 2006).

# Appendix 1: Plants[1]

| Scientific name | Common name |
|---|---|
| Coniferous trees: | |
| *Abies amabilis* (Dougl.) Forbes[2] | Pacific silver fir |
| *Abies procera* Rehder | Noble fir |
| *Pseudotsuga menziesii* (Mirbel) Franco. | Douglas-fir |
| *Tsuga heterophylla* (Raf.) Sarg. | Western hemlock |
| Tall shrubs 2 to 8 m (6.6 to 26.3 ft) tall: | |
| *Sambucus racemosa* L. var. *arborescens* (T. & G.) Gray | Red elderberry |
| Medium shrubs 0.5 to 2 m (1.6 to 6.6 ft) tall: | |
| *Gaultheria shallon* Pursh | Salal |
| *Oplopanax horridus* (Smith) Miq. | Devilsclub |
| *Ribes bracteosum* Dougl. | Stink currant |
| *Ribes lacustre* (Pers.) Poir. | Swamp currant |
| *Rubus spectabilis* Pursh | Salmonberry |
| *Vaccinium ovalifolium* Sm. | Early huckleberry |
| *Vaccinium parvifolium* Sm. | Red huckleberry |
| Low shrubs <0.5 m (1.6 ft) tall: | |
| *Rubus pedatus* J.E. Smith | Strawberry dwarf bramble |
| Ferns: | |
| *Athyrium filix-femina* (L.) Roth. | Lady fern |
| *Blechnum spicant* (L.) With. | Deerfern |
| *Dryopteris* sp. | Woodfern |
| *Polystichum munitum* (Kaulf.) Presl | Western swordfern |
| Herbs: | |
| *Achlys triphylla* (Smith) DC. | Vanilla leaf |
| *Anemone deltoidea* Hook. | Three-leaved anemone |
| *Anemone lyallii* Britt. | Lyall's anemone |
| *Chrysosplenium glechomifolium* Nutt. | Western golden carpet |
| *Claytonia sibirica* (L.) Howell | Siberian miner's lettuce |
| *Clintonia uniflora* (Schult.) Kunth | Queenscup beadlily |
| *Coptis laciniata* Gray | Cut-leaf goldthread |
| *Corallorrhiza mertensiana* Bong. | Pacific coralroot |
| *Dicentra formosa* (Andr.) Walpers | Pacific bleedingheart |
| *Galium triflorum* Michx. | Sweetscented bedstraw |
| *Hieracium albiflorum* Hook. | White-flowered hawkweed |
| *Hydrophyllum tenuipes* Heller | Slender-stem waterleaf |
| *Listera caurina* Piper | Western twayblade |
| *Maianthemum dilatatum* (Wood) Nels. & Macbr. | False lily-of-the-valley |
| *Maianthemum stellatum* (L.) Desf. | Starry false-Solomonseal |
| *Mimulus dentatus* Nutt. ex Benth. | Tooth-leaved monkeyflower |
| *Mitella ovalis* Greene | Oval-leaved miterwort |
| *Moneses uniflora* Gray | Woodnymph |
| *Montia parvifolia* (Moc.) Greene | Streambank springbeauty |
| *Nemophila parviflora* Dougl. ex Benth. | Smallflower nemophila |
| *Orthilia secunda* (L.) House | Sidebells wintergreen |
| *Osmorhiza berteroi* DC. | Mountain sweet-cicely |
| *Oxalis oregana* Nutt. | Oregon oxalis |
| *Prosartes smithii* (Hook.) Utech, Shinwari & Kawano | Smith's fairybells |

| Scientific name | Common name |
|---|---|
| *Pyrola picta* Sm. | Whitevein pyrola |
| *Scoliopus hallii* Wats. | Fetid adder's-tongue |
| *Senecio triangularis* Hook. | Arrowleaf groundsel |
| *Stachys mexicana* Benth. | Mexican hedge-nettle |
| *Stellaria crispa* Cham. & Schlect. | Crisped starwort |
| *Streptopus amplexifolius* (L.) DC. | Claspingleaf twistedstalk |
| *Tiarella trifoliata* L. | Threeleaf foamflower |
| *Tolmiea menziesii* (Pursh) T. & G. | Piggyback plant |
| *Trautvetteria caroliniensis* (Walt.) Vail | False bugbane |
| *Trillium ovatum* Pursh | Western trillium |
| *Viola glabella* Nutt. | Stream violet; yellow wood violet |
| *Viola sempervirens* Greene | Redwoods violet |
| Grasses and graminoids: | |
| *Bromus vulgaris* (Hook.) Shear | Columbia brome |
| *Luzula parviflora* (Ehrh.) Desv. | Small-flowered woodrush |
| *Melica subulata* (Griseb.) Scribn. | Alaska oniongrass |
| *Poa marcida* A.S. Hitchc. | Withered bluegrass |

[1] Compiled from numerous sources.
[2] Nomenclature for vascular plants, ferns, and fern-allies follows the *Flora of North America* Web site (2006) and the Oregon Flora Project Web site (2006).

# Appendix 2: Amphibians, Reptiles, Birds, and Mammals[1]

| Order | Scientific name | Common name |
|---|---|---|
| **Amphibians** | | |
| Caudata | *Ambystoma gracile* | Northwestern salamander |
| | *Ambystoma macrodactylum* | Long-toed salamander |
| | *Aneides ferreus* | Clouded salamander |
| | *Dicamptodon tenebrosus* | Pacific giant salamander |
| | *Ensatina eschscholtzi* | Ensatina |
| | *Plethodon dunni* | Dunn's salamander |
| | *Plethodon vehiculum* | Western redback salamander |
| | *Rhyacotriton variegatus* | Southern torrent salamander |
| | *Taricha granulosa* | Rough-skinned newt |
| Anura | *Ascaphus truei* | Tailed frog |
| | *Bufo boreas* | Western toad |
| | *Pseudacris regilla* | Pacific chorus frog |
| | *Rana aurora* | Red-legged frog |
| **Reptiles** | | |
| Squamata | *Elgaria coerulea* | Northern alligator lizard |
| | *Charina bottae* | Rubber boa |
| | *Coluber constrictor* | Racer |
| | *Contia tenuis* | Sharptail snake |
| | *Eumeces skiltonianus* | Western skink |
| | *Sceloporus occidentalis* | Western fence lizard |
| | *Thamnophis elegans* | Western terrestrial garter snake |
| | *Thamnophis ordinoides* | Northwestern garter snake |
| | *Thamnophis sirtalis* | Common garter snake |
| **Birds** | | |
| Falconiformes | *Accipiter cooperii* | Cooper's hawk |
| | *Accipiter gentilis* | Northern goshawk |
| | *Accipiter striatus* | Sharp-shinned hawk |
| | *Buteo jamaicensis* | Red-tailed hawk |
| | *Cathartes aura* | Turkey vulture |
| | *Circus cyaneus* | Northern harrier |
| | *Falco sparverius* | American kestrel |
| | *Haliaeetus leucocephalus* | Bald eagle |
| Galliformes | *Bonasa umbellus* | Ruffed grouse |
| | *Callipepla californica* | California quail |
| | *Dendragapus obscurus* | Blue grouse |
| | *Oreortyx pictus* | Mountain quail |
| | *Phasianus colchicus* | Ring-necked pheasant |
| Charadriiformes | *Actitis macularia* | Spotted sandpiper |
| | *Brachyramphus marmoratus* | Marbled murrelet |
| | *Charadrius vociferus* | Killdeer |
| Columbiformes | *Columba fasciata* | Band-tailed pigeon |
| | *Zenaida macroura* | Mourning dove |
| Strigiformes | *Aegolius acadicus* | Northern saw-whet owl |
| | *Bubo virginianus* | Great-horned owl |

| Order | Scientific name | Common name |
|---|---|---|
| | *Glaucidium gnoma* | Northern pygmy owl |
| | *Otus kennicottii* | Western screech-owl |
| | *Strix occidentalis* | Spotted owl |
| | *Strix varia* | Barred owl |
| Caprimulgiformes | *Chordeiles minor* | Common nighthawk |
| Apodiformes | *Chaetura vauxi* | Vaux's swift |
| | *Selasphorus rufus* | Rufous hummingbird |
| Coraciiformes | *Ceryle alcyon* | Belted kingfisher |
| Piciformes | *Colaptes auratus* | Northern flicker |
| | *Dryocopus pileatus* | Pileated woodpecker |
| | *Picoides pubescens* | Downy woodpecker |
| | *Picoides villosus* | Hairy woodpecker |
| | *Sphyrapicus ruber* | Red-breasted sapsucker |
| Passeriformes | *Bombycilla cedrorum* | Cedar waxwing |
| | *Carduelis pinus* | Pine siskin |
| | *Carduelis tristis* | American goldfinch |
| | *Carpodacus purpureus* | Purple finch |
| | *Catharus ustulatus* | Swainson's thrush |
| | *Certhia americana* | Brown creeper |
| | *Chamaea fasciata* | Wrentit |
| | *Cinclus mexicanus* | American dipper |
| | *Coccothraustes vespertinus* | Evening grosbeak |
| | *Contopus borealis* | Olive-sided flycatcher |
| | *Contopus sordidulus* | Western wood peewee |
| | *Corvus brachyrhynchos* | American crow |
| | *Corvus corax* | Common raven |
| | *Cyanocitta stelleri* | Steller's jay |
| | *Dendroica coronata* | Yellow-rumped warbler |
| | *Dendroica nigrescens* | Black-throated gray warbler |
| | *Dendroica occidentalis* | Hermit warbler |
| | *Dendroica petechia* | Yellow warbler |
| | *Empidonax difficilis* | Pacific-slope flycatcher |
| | *Empidonax hammondii* | Hammond's flycatcher |
| | *Empidonax traillii* | Willow flycatcher |
| | *Geothlypis trichas* | Common yellowthroat |
| | *Ixoreus naevius* | Varied thrush |
| | *Junco hyemalis* | Dark-eyed junco |
| | *Loxia curvirostra* | Red crossbill |
| | *Melospiza melodia* | Song sparrow |
| | *Molothrus ater* | Brown-headed cowbird |
| | *Myadestes townsendi* | Townsend's solitaire |
| | *Oporornis tolmiei* | MacGillivray's warbler |
| | *Parus atricapillus* | Black-capped chickadee |
| | *Parus rufescens* | Chestnut-backed chickadee |
| | *Perisoreus canadensis* | Gray jay |
| | *Pheucticus melanocephalus* | Black-headed grosbeak |
| | *Pipilo maculatus* | Spotted towhee |
| | *Piranga rubra* | Western tanager |
| | *Progne subis* | Purple martin |

| Order | Scientific name | Common name |
|---|---|---|
| | *Psaltriparus minimus* | Bushtit |
| | *Regulus satrapa* | Golden-crowned kinglet |
| | *Sialia mexicana* | Western bluebird |
| | *Sitta canadensis* | Red-breasted nuthatch |
| | *Spizella passerina* | Chipping sparrow |
| | *Stelgidopteryx serripennis* | Northern rough-winged swallow |
| | *Tachycineta bicolor* | Tree swallow |
| | *Tachycineta thalassina* | Violet-green swallow |
| | *Thryomanes bewickii* | Bewick's wren |
| | *Troglodytes aedon* | House wren |
| | *Troglodytes troglodytes* | Winter wren |
| | *Turdus migratorius* | American robin |
| | *Vermivora celata* | Orange-crowned warbler |
| | *Vermivora ruficapilla* | Nashville warbler |
| | *Vireo gilvus* | Warbling vireo |
| | *Vireo huttoni* | Hutton's vireo |
| | *Vireo solitarius* | Solitary vireo |
| | *Wilsonia pusilla* | Wilson's warbler |
| | *Zonotrichia leucophrys* | White-crowned sparrow |
| **Mammals** | | |
| Didelphimorphia | *Didelphis virginiana* | Virginia opossum |
| Insectivora | *Neurotrichus gibbsii* | Shrew-mole |
| | *Scapanus orarius* | Coast mole |
| | *Scapanus townsendii* | Townsend's mole |
| | *Sorex bairdi* | Baird's shrew |
| | *Sorex bendirii* | Pacific marsh shrew |
| | *Sorex pacificus* | Pacific shrew |
| | *Sorex sonomae* | Fog shrew |
| | *Sorex trowbridgii* | Trowbridge's shrew |
| | *Sorex vagrans* | Vagrant shrew |
| Chiroptera | *Corynorhinus townsendii* | Townsend's big-eared bat |
| | *Eptesicus fuscus* | Big brown bat |
| | *Lasionycteris noctivagans* | Silver-haired bat |
| | *Lasiurus cinereus* | Hoary bat |
| | *Myotis californicus* | California myotis |
| | *Myotis evotis* | Long-eared myotis |
| | *Myotis lucifugus* | Little brown myotis |
| | *Myotis thysanodes* | Fringed myotis |
| | *Myotis volans* | Long-legged myotis |
| | *Myotis yumanensis* | Yuma myotis |
| Lagomorpha | *Lepus americanus* | Snowshoe hare |
| | *Sylvilagus bachmani* | Brush rabbit |
| Rodentia | *Aplodontia rufa* | Mountain beaver |
| | *Castor canadensis* | American beaver |
| | *Clethrionomys californicus* | Western red-backed vole |
| | *Erethizon dorsatum* | Common porcupine |
| | *Glaucomys sabrinus* | Northern flying squirrel |
| | *Microtus longicaudus* | Long-tailed vole |
| | *Microtus oregoni* | Creeping vole |

| Order | Scientific name | Common name |
|---|---|---|
| | *Microtus townsendii* | Townsend' vole |
| | *Neotoma cinerea* | Bushy-tailed woodrat |
| | *Neotoma fuscipes* | Dusky-footed woodrat |
| | *Peromyscus maniculatus* | Deer mouse |
| | *Phenacomys albipes* | White-footed vole |
| | *Phenacomys longicaudus* | Red tree vole |
| | *Spermophilus beecheyi* | California ground squirrel |
| | *Tamias townsendii* | Townsend's chipmunk |
| | *Tamiasciurus douglasii* | Douglas' squirrel |
| | *Thomomys mazama* | Western pocket gopher |
| | *Zapus trinotatus* | Pacific jumping mouse |
| Carnivora | *Canis latrans* | Coyote |
| | *Felis concolor* | Mountain lion |
| | *Lutra canadensis* | Northern river otter |
| | *Lynx rufus* | Bobcat |
| | *Martes americana* | American marten |
| | *Mephitis mephitis* | Striped skunk |
| | *Mustela erminea* | Ermine |
| | *Mustela frenata* | Long-tailed weasel |
| | *Mustela vison* | Mink |
| | *Odocoileus hemionus* ssp. *columbianus* | Black-tailed deer |
| | *Procyon lotor* | Common raccoon |
| | *Spilogale gracilis* | Western spotted skunk |
| | *Urocyon cinereoargenteus* | Common gray fox |
| | *Ursus americanus* | Black bear |
| | *Vulpes vulpes* | Red fox |
| Artiodactyla | *Cervus elaphus* | Elk |

[1] Nomenclature, distribution and habitat characteristics taken from Csuti et al. 1997.

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