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Upper Elk Meadows Research Natural Area: Guidebook Supplement 43

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Cover photograph: Upper Elk Meadows Research Natural Area (RNA). Oblique aerial view looking west into Rock Creek drainage. By Reid Schuller.

Abstract

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This guidebook describes Upper Elk Meadows Research Natural Area (RNA), a 90-ha (223-ac) area that supports a mixture of coniferous forest and open, shrub- and herb-dominated wetlands. The major forest plant association present within Upper Elk Meadows RNA is Pacific silver fir/vine maple/coolwort foamflower (*Abies amabilis/Acer circinatum-Tiarella trifoliata*).

Keywords: Research natural area, area of critical environmental concern, old-growth Douglas-fir (*Pseudotsuga menziesii*), old-growth Pacific silver fir (*Abies amabilis*), freshwater seep, wet meadow, fen, Umpqua swertia (*Frasera umpquaensis*), Pacific silver fir/vine maple/coolwort foamflower (*Abies amabilis/Acer circinatum/Tiarella trifoliata*) plant association, Sitka alder (*Alnus viridis*) streamside community.

Preface

The research natural area (RNA) described in this supplement¹ is administered by the Eugene District, Bureau of Land Management (BLM), U.S. Department of the Interior.

Upper Elk Meadows RNA is part of a federal system² of natural areas established for research and educational purposes.³ Of the 183 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). This report is a supplement to the guidebook.

Each RNA is a site where elements⁴ 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 for those that are rare and endangered.

The guiding principle in managing RNAs is to maintain natural ecological processes or conditions for which the site is designated. Activities that impair scientific or educational values are not permitted within RNAs. Management practices necessary to maintain or restore ecosystems may be allowed.⁵

¹ Supplement No. 43 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 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. In addition, the federal agencies cooperate with state agencies and private organizations in Oregon and Washington in the Pacific Northwest Interagency Natural Area Committee. Taken from Wilson, T.M.; Schuller, R.; Holmes, R.; Pavola, C.; Fimbel, R.A.; McCain, C.N.; Gamon, J.G.; Speaks, P.; Seevers, J.I.; DeMeo, T.E.; Gibbons, S. 2009. Interagency strategy for the Pacific Northwest Natural Areas Network. Gen. Tech. Rep. PNW-GTR-798. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 33 p.

³ See Wilson et al. (2009) for a more complete discussion of rationale for establishment of RNAs.

⁴ Elements are the basic units to be represented in a natural area system. An element may 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-38. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 231 p.

⁵ See Wilson et al. (2009) for a discussion of management direction and strategies which guide management of federal RNA.

Federal RNAs provide a unique system of publicly owned and protected examples of relatively unmodified 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. Scientists and educators wishing to visit or use Upper Elk Meadows for scientific or educational purposes should contact the Eugene BLM district office 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.

A scientist or educator wishing to use the RNA is obligated to:

- Obtain permission from the appropriate administering agency before using the area.
- 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 this approval process is to:

- Ensure that the ecological integrity and scientific and educational values of the tract are not compromised.
- Allow the agency to document research or educational use of the tract.
- Help promote the dissemination and use of information collected at the site.
- Avoid conflict between ongoing studies and activities.

Appropriate uses of RNAs are determined by the administering agency.

Destructive analysis of vegetation is generally not allowed, nor are studies requiring extensive substrate modification such as extensive soil excavation. Collection of plant and animal specimens is generally restricted to voucher specimens or approved research activities. Under no circumstances may collecting significantly reduce species populations. Collecting must also be carried out in accordance with all other federal and state agency regulations.

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Introduction

Upper Elk Meadows Research Natural Area (RNA) is a 90-ha (223-ac) area located in Lane County, Oregon (fig. 1). The site was established in 1984 as an RNA (Curtis 1986). The designation was reaffirmed by the Eugene District Resource Management Plan along with an increase in size of the area (USDI BLM 1995).

A short guidebook was written for the area in 1986 (Curtis 1986). Since that time, additional information has been compiled, including surveys of lichens (Hardman 2010, Neitlich and McCune 1995, Widmer and Walker 1997–1998), bryophytes (Hardman 2010, Widmer and Walker 1997–1998), and fungi (USDI BLM 2011, Widmer and Walker 1997–1998). Long-term vegetation monitoring was established in 2000 (Schuller et al. 2000) and remeasured in 2008 (Schuller and Greene 2008). Recent publication of a plant association¹ guide for the west side central Cascades of northwest Oregon (McCain and Diaz 2002) provides an ecoregional framework from which native vegetation within the RNA may be classified and characterized. Publication of the Oregon Natural Areas Plan in 2010 (ONHAC 2010) provides a statewide and ecoregional framework from which the importance of the biotic features represented within the RNA may be assessed.

The RNA was designated as an area of critical environmental concern (ACEC) and as an RNA based on the presence of a variety of vegetation communities representative of the western Cascades ecoregion (Dyrness et al. 1975, ONHAC 2010) (see app. 1 for scientific and common names). These are listed in the 2010 Natural Heritage Plan (ONHAC 2010) as:

- Pacific silver fir/vine maple (*Abies amabilis*/*Acer circinatum*) forest plant association
- Forb flush on seepage slope
- Sitka alder/lady fern (*Alnus viridis* ssp. *sinuata*/*Athyrium filix-femina*) swamp

In addition, the RNA supports a population of Umpqua swertia (*Frasera umpquaensis*) (Loring 2010, Wilson et al. 2010), a sensitive plant species (ONHAC 2010, USFS/BLM 2011) in Oregon.

¹ Plant associations are named based on a combination of the dominant life form plus the characteristic or dominant plant species in the various plant layers (trees, shrubs, and herbs). Plant association acronyms are a shorthand form for communicating the plant association name. Each acronym is made up of the first two letters of the genus name of the dominant or characteristic species within a layer, and combined with the first two letters of the specific epithet of the species (e.g., *Abies amabilis* is shortened to ABAM). Plant associations are generally defined by the dominant or characteristic species which occupies or has the biological potential to occupy the uppermost vegetation layer. In forested plant associations, this is the tree layer. Additional names are used for understory layers when they contain dominant, characteristic, or diagnostic species (e.g., Pacific silver fir/vine maple/oneleaf foamflower = *Abies amabilis*/*Acer circinatum*/*Tiarella trifoliata* var. *unifoliata* = ABAM/ACCI/TITRUN). Life form layers are separated by a “/”. Co-dominants within a layer are separated by a hyphen.

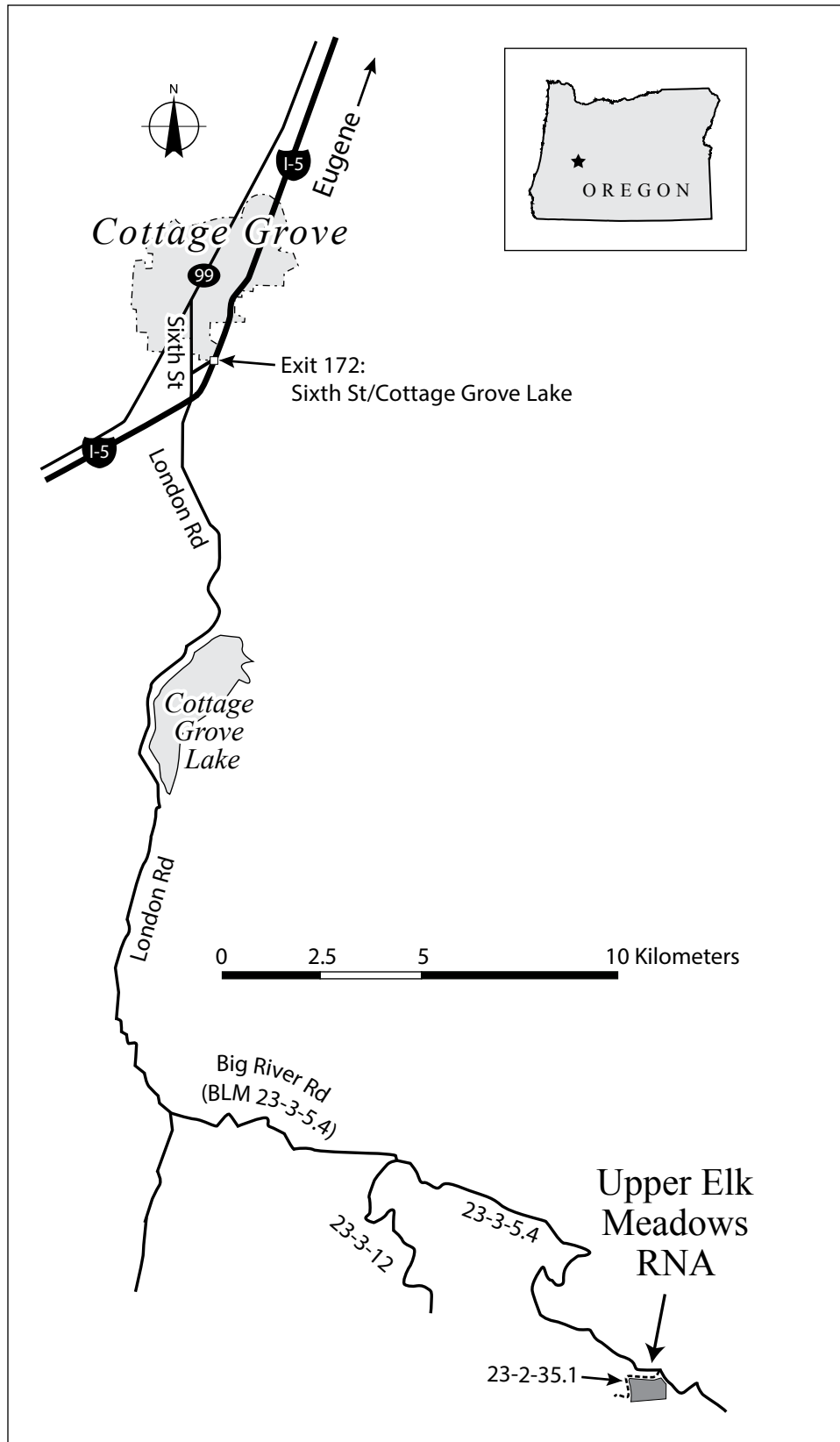


Figure 1—Upper Elk Meadows Research Natural Area (RNA) location and access.

Access and Accommodations

The RNA is located in Section 35, Township 23 South, Range 2 West, Willamette Meridian, in Douglas County, Oregon. The tract is located approximately 60 km (37 mi) air mile south southeast of Eugene, Oregon. To reach the site from Eugene, proceed 36 km (22.5 mi) south on Interstate 5 to the Sixth St./Cottage Grove Lake exit (Exit 172). Turn left onto Sixth St. and cross over Interstate 5. At this point, Sixth St. turns into London Road. Continue south for 23 km (14 mi) to (BLM) Big River access road 23-3-5.4. Travel east on the Big River access road for approximately 22 km (13.5 mi) to BLM road 23-2-35.1, which is the northern boundary of the RNA (USDI BLM 1983) (fig. 1).

Prior to visiting the site, obtain permission to access the area for research or educational purposes at the BLM, Eugene District office in Springfield, Oregon. Maps and additional directions to the area are available at the district office. A gate key is required to access the RNA.

The purposes of the approval process for research and monitoring on RNAs are:

- To ensure that the ecological integrity of the RNA or other purposes for which the RNA was designated are not damaged by research or related activities.
- To provide information to scientists about other research occurring on the RNA so that potential collaborations may be fostered and conflicts avoided.
- To ensure that protection and site integrity for the individual scientific study, especially permanent plots, are maintained.
- To maintain records of research activities and research results to benefit the BLM, other agencies, and future researchers (Wilson et al. 2009).

Lodging is available in Eugene, Springfield, Cottage Grove, and Creswell, Oregon.

Environment

The RNA is situated along the upper slope of the Calapooya Divide, a westerly trending ridge system that extends from the heart of the western Cascade Mountains to the upper end of the Coast Fork of the Willamette River. South-facing exposures predominate on the site although areas of north, west, and east exposures are also present in minor amounts. Slopes range from gentle to steep (fig. 2). Nine springs (fig. 3) arise within the RNA and join their flows to form the headwaters of Rock Creek, which flows southwest through the site and exits in the southwest corner (Curtis 1986, USDI BLM 1983). Elevations range from 1337 m (4,385 ft) in the eastern portion of the tract to 1213 m (3,980 ft) along the southwestern RNA boundary.

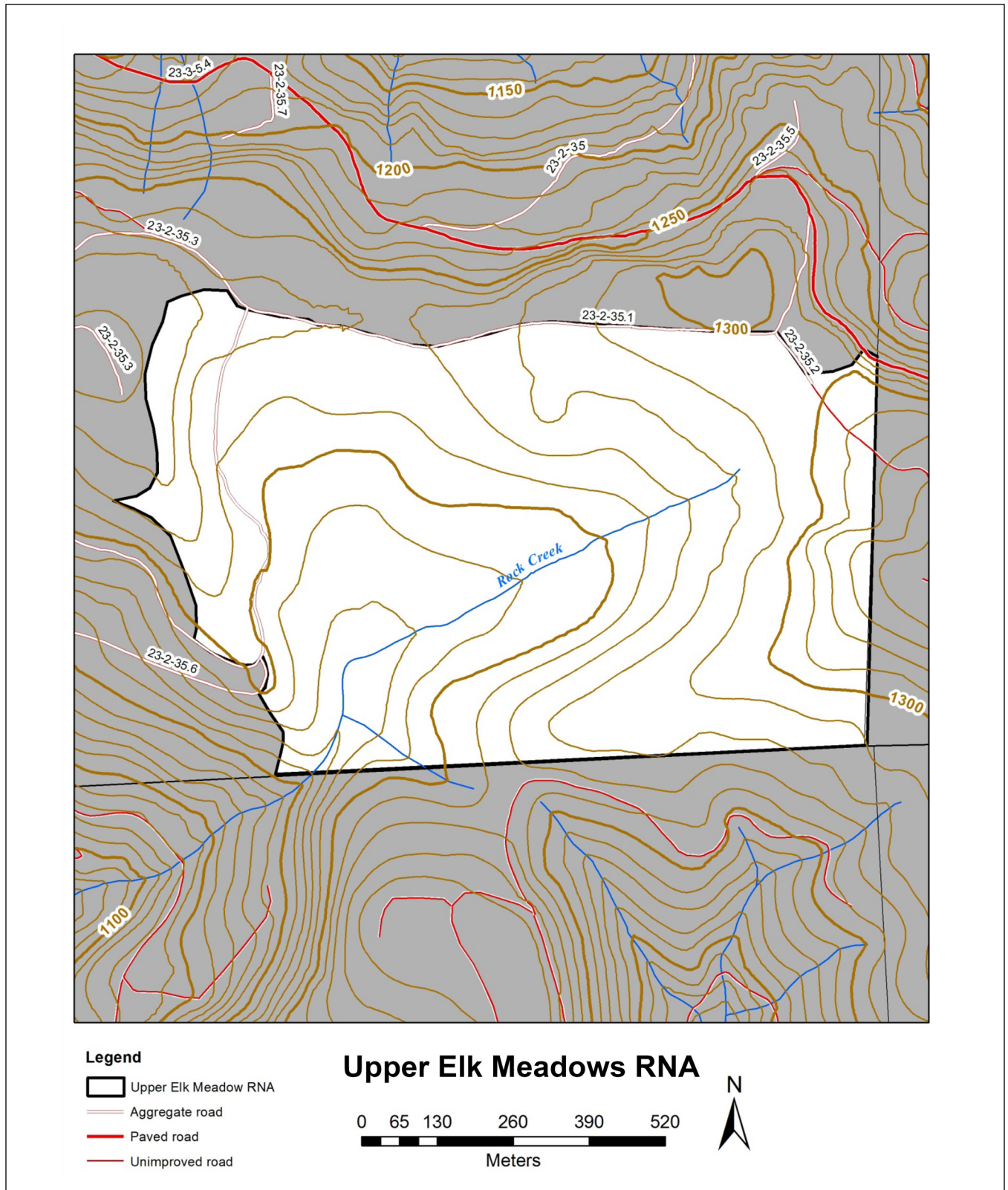


Figure 2—Upper Elk Meadows Research Natural Area (RNA) topography and hydrology.



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Figure 3—One of several springs percolating to the surface within the wet meadows of Upper Elk Meadows Research Natural Area.

The RNA is underlain by rocks of the Little Butte Volcanic Series deposited during the Oligocene and early Miocene epochs. These rocks include gray-colored andesite flows interbedded with breccias and other pyroclastics (Peck et al. 1964). Small bedrock outcrops are exposed in the southwest corner of the tract adjacent to Rock Creek, and near the northern RNA boundary along BLM road 23-3-5.4 (USDI BLM 1983).

Some areas adjacent to the wet meadow have poorly drained soils because of the gentle relief and abundance of water. The adjacent forest areas dominated by Pacific silver fir (*Abies amabilis*) and grand fir (*Abies grandis*) are open, probably as a result of a high water table (Curtis 1986).

Forested portions of the RNA include the deep, well-drained Oneonta-Keel soil complex. These soils are derived from the underlying basic igneous rocks. A typical soil profile appears in table 1 (USDA NRCS 2012). Meadow soils are clay water-logged soils and are classified as either Histic Cryaquepts or Typic Cryaquepts. Snowmelt water infiltrates meadow soils until it encounters an impermeable layer of pyroclastic rock. Water flows laterally on this rock and surfaces at several locations within the meadows. This cold, slow-moving water is responsible for the anaerobic conditions that produce the sometimes mottled blue clay meadow soils and the overlying peat layer. The peat layer is discontinuous but is as thick as 410 mm (16 in) deep (USDI BLM 1983).

Climate

The climate is characterized by warm, dry summers and cool, moist winters. The July mean maximum temperature is 27 °C (81 °F), and the January mean minimum temperature is 1.6 °C (32 °F). Annual precipitation averages about 1520 mm (60 in) with 70 percent occurring from November through March (USDI BLM 1983). Vegetation plots supporting the Pacific silver fir/vine maple/coolwort foamflower plant association present at Upper Elk Meadows average 2108 mm (83 in) of annual precipitation (McCain and Diaz 2002). No data are available on the percentage of annual precipitation that occurs as snow; however, snowpack depth between 610 mm to 910 mm (2 to 3 ft) has been measured in late December and early May. Prevailing winds from the southwest are associated with storms, which move across the area from late fall through early spring (USDI BLM 1983).

Table 1—Typical soil profile of Oneonta soil series, 3 to 30 percent slopes

| Layer depth | Description |
|----------------------------|------------------------------------|
| 0 to 5 cm (0 to 2 in) | Slightly decomposed plant material |
| 5 to 18 cm (2 to 7 in) | Gravelly loam |
| 18 to 91 cm (7 to 36 in) | Loam |
| 91 to 152 cm (36 to 60 in) | Loam |

Vegetation

The RNA supports a mosaic of open and shrub-covered wet meadows surrounded by old-growth conifer forest (fig. 4). Open, wet sedge meadows (fig. 5) are dominated by woodrush sedge (*Carex luzulina*), star sedge (*C. echinata*), panicled bulrush (*Scirpus microcarpus*), and a variety of herbaceous species. Typical herbs include American bistort (*Bistorta bistortoides*), western dock (*Rumex occidentalis*), white marsh marigold (*Caltha leptosepala*), Tinker's penny (*Hypericum anagaloides*), western coneflower (*Rudbeckia occidentalis*), and coastal brookfoam (*Boykinia occidentalis*). Table 2 summarizes plant species composition along four permanent transects that extend through the open- and shrub-dominated wet meadows at Upper Elk Meadows (Curtis 1986, Schuller and Greene 2008).

Dense shrub thickets occur throughout the wet meadows in varying species combinations (McCain and Christy 2005). Major species include Sitka alder (*Alnus viridis* ssp. *sinuata*), Geyer willow (*Salix geyeriana*), Scouler's willow (*Salix scouleriana*), Sitka willow (*Salix sitchensis*), and Suksdorf's hawthorn (*Crataegus suksdorfii*) (Loring and Whitridge 2010, Schuller and Greene 2008). Shrubs appear to be invading the open wet meadows, especially in areas of deeper snow accumulation adjacent to forests dominated by Pacific silver fir and grand fir (Curtis 1986). In addition, small deciduous trees have become established in the meadows, including: Oregon crabapple (*Pyrus fusca*), bitter cherry (*Prunus emarginata*), and western mountain ash (*Sorbus sitchensis*). Together, the two wetland vegetation types occupy 16-ha (41 ac) within the central portions of the RNA.

A narrow 29-ha (71 ac) band of Pacific silver fir-grand fir forest surrounds the wetlands. Pacific silver fir is the major canopy tree and grand fir, western hemlock (*Tsuga heterophylla*) are minor canopy components (fig. 6). Vine maple frequently occurs in dense patches in the tall shrub layer. Widely scattered old-growth Pacific silver fir exceeds 100 cm (40 in) d.b.h.² with one specimen measuring 182 cm (72 in) d.b.h. These true fir stands are multiaged as reflected in the almost continuous range of tree diameters and presumed age distribution (Curtis 1986, Schuller and Greene 2008). Shrub density beneath the Pacific silver fir overstory is highly variable. Dense tangles of vine maple characterize the moist forest shrub layer. Pacific rhododendron (*Rhododendron macrophyllum*) occupies slightly drier sites, especially beneath the old-growth Douglas-fir forest canopy (Curtis 1986, Loring and Whitridge 2010). Typical forest understory species include inside-out flower (*Vancouveria hexandra*), one-leaf foamflower (*Tiarella trifoliata* var. *unifoliata*), starry false Solomonseal (*Maianthemum stellatum*), and bride's bonnet (*Clintonia uniflora*).

²“d.b.h.” refers to diameter at breast height, a measurement taken at 1.47 m above the ground.

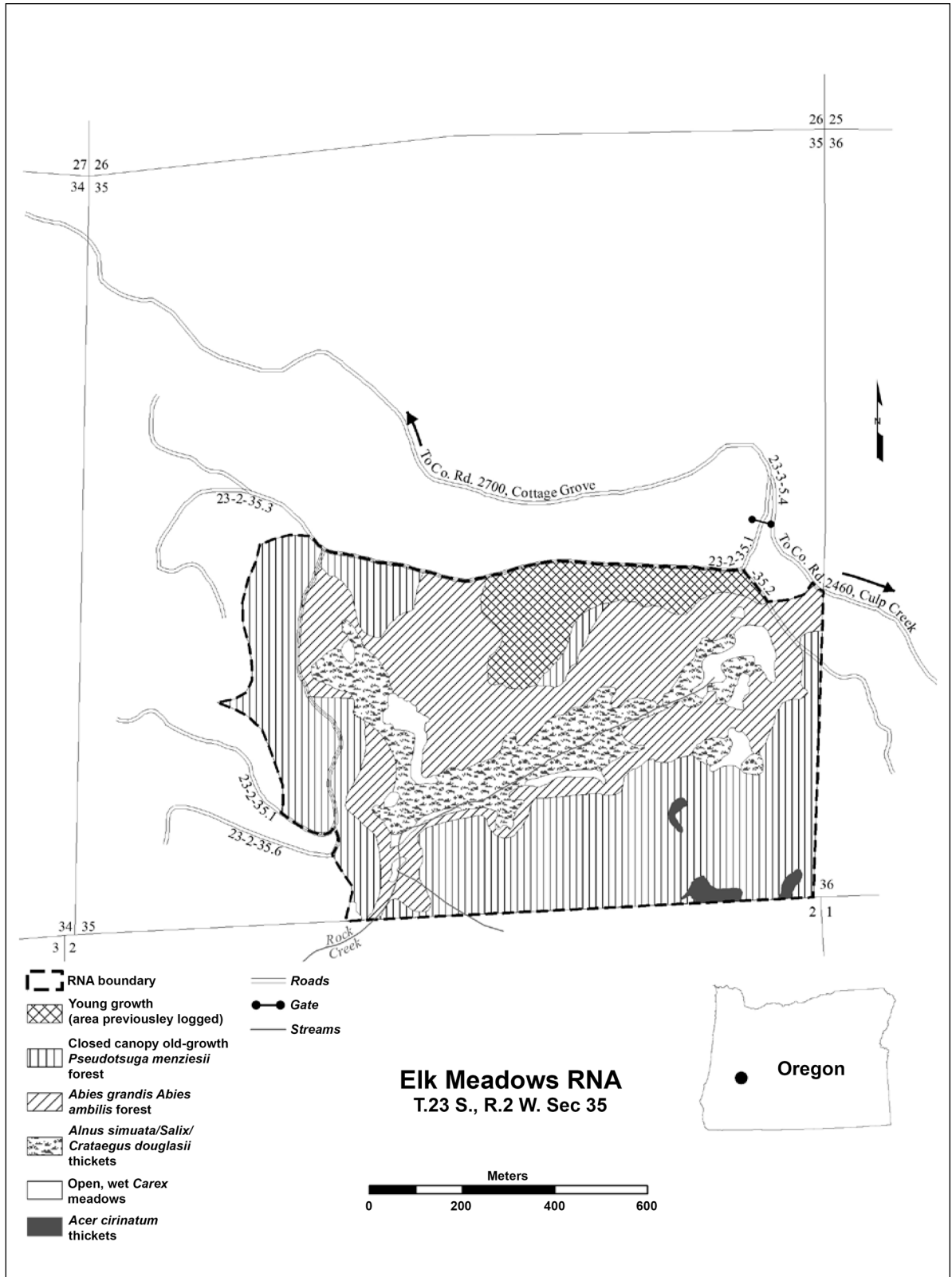


Figure 4—Upper Elk Meadows Research Natural Area (RNA) plant communities.



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Figure 5—Late fall view of open wet meadow and alder-willow-hawthorn thicket. Old-growth forest in the background is dominated by Douglas-fir, Pacific silver fir, and western hemlock.

Forests are moderately open, with a parklike physiognomy. Forest openings are dominated by herbaceous species and grasses, including sickletop lousewort (*Pedicularis racemosa*), Cusick's checkerbloom (*Sidalcea cusickii*), sweetcicely (*Osmorhiza berteroi*), tall trisetum (*Trisetum cernuum*), Alaska oniongrass (*Melica subulata*), blue wildrye (*Elymus glaucus*), yellowleaf iris (*Iris chrysophylla*), and seaside bird's-foot trefoil (*Lotus formosissimus*) (fig. 7). Umpqua swertia (*Frasera umpquaensis*) (fig. 8) also occurs in forest openings as well as along open edges of wet meadows (Loring and Whitridge 2010). The Umpqua swertia is currently listed as a Sensitive species on the BLM OR/WA State Director Special Status Species list (USFS BLM 2011).

Table 2—Understory coverage, and frequency in four wet meadow transects in Upper Elk Meadows Research Natural Area.

| | Transect 1 | | Transect 2 | | Transect 3 | | Transect 4 | |
|--|------------------------|-------|------------|-------|------------|-------|------------|-------|
| | Frequency ^a | Cover | Frequency | Cover | Frequency | Cover | Frequency | Cover |
| Bare ground | 33 | 3 | 100 | 54 | 45 | 20 | 100 | 45 |
| Coarse litter | | | | | | | | |
| Fine litter | 100 | 97 | 90 | 19 | 73 | 47 | 100 | 38 |
| Moss | | | 60 | 8 | 27 | 6 | 82 | 14 |
| Lichen | 11 | + | | | | | | |
| <i>Crataegus suksdorfii</i> ^b | – | | – | 16 | – | | – | 7 |
| <i>Trisetum cernuum</i> | 56 | 3 | | | | | | |
| <i>Pteridium aquilinum</i> | 44 | 13 | | | | | | |
| <i>Calystegia atriplicifolia</i> | 55 | 13 | | | | | | |
| <i>Iris chrysophylla</i> | 44 | 8 | | | | | | |
| <i>Carex pachystachya</i> | 66 | 7 | | | | | | |
| <i>Achillea millefolium</i> | 77 | 5 | | | | | | |
| <i>Lupinus latifolius</i> | 11 | 4 | | | | | | |
| <i>Lathyrus nevadensis</i> | | | | | | | | |
| var. <i>pilosellus</i> | 22 | 3 | | | | | | |
| <i>Heracleum lanatum</i> | 11 | 2 | | | | | | |
| <i>Scirpus macrocarpus</i> | | | 100 | 16 | 100 | 28 | 73 | 23 |
| <i>Bistorta bistortoides</i> | | | 90 | 16 | | | 91 | 15 |
| <i>Rumex occidentalis</i> | | | 20 | 13 | | | 18 | 3 |
| <i>Sidalcea cusickii</i> | | | 90 | 11 | | | 73 | 6 |
| <i>Caltha leptosepala</i> | | | 50 | 6 | 91 | 14 | | |
| <i>Juncus effusus</i> | | | 30 | 4 | | | | |
| <i>Hypericum anagaloides</i> | | | 30 | 4 | 73 | 14 | | |
| <i>Senecio triangularis</i> | | | 40 | 3 | | | 45 | 3 |
| <i>Carex luzulina</i> | | | 30 | 4 | 73 | 11 | 27 | 4 |
| <i>Lotus formosissimus</i> | | | 20 | 2 | 36 | 4 | | |
| <i>Stachys palustris</i> | | | 20 | 5 | | | | |
| <i>Juncus ensifolius</i> | | | 20 | 1 | | | | |
| <i>Boykinia occidentalis</i> | | | | | 82 | 15 | | |
| <i>Carex echinata</i> | | | | | 73 | 8 | | |
| <i>Bistorta bistortoides</i> | | | | | 91 | 21 | | |
| <i>Angelica genuflexa</i> | | | | | | | 36 | 4 |
| <i>Veronica americana</i> | | | | | | | 27 | 1 |
| <i>Athyrium filix-femina</i> | | | | | | | 9 | 9 |
| <i>Trifolium howellii</i> | | | | | | | 64 | 19 |

^a Cover is expressed as percentage of foliar cover; frequency is expressed as percentage of relative frequency. Zero values are not included.

^b See appendix 1 for a listing of scientific and common names.



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Figure 6—Forest understory beneath old-growth Pacific silver fir. Sparse herbaceous understory with seedling/sapling growth exclusively Pacific silver fir.

Old-growth Douglas-fir (*Pseudotsuga menziesii*) occurs sporadically throughout the RNA. Closed-canopy old-growth stands of Douglas-fir forest occupy 26-ha (64 ac) and occur on slightly warmer, drier forest soils. Large trees typically range between 100 and 160 cm d.b.h and 45 m (148 ft) in height. Tree ages exceed 300 years. Pacific silver fir (major) and grand fir (minor) recruitment is extensive throughout the RNA. Western white pine (*Pinus monticola*) occurs within this forest type along the south RNA boundary (Curtis 1986). Forest understories are often dominated by tangled, stands of Pacific rhododendron and vine maple. Lower growing shrubs include salal (*Gaultheria shallon*), prickly currant (*Ribes lacustre*), thinleaf huckleberry (*Vaccinium membranaceum*), and Oregon grape (*Berberis nervosa*). Vanilla leaf (*Achlys triphylla*) and inside-out flower (*Vancouveria hexandra*) occur as major herbs. Common beargrass (*Xerophyllum tenax*) is abundant on drier sites (Curtis 1986, Schuller and Greene 2008).

In the southwestern corner of the RNA, a basaltic outcrop and talus slope 0.4 ha (1 ac) in size supports xeric site species including the shrub Oregon boxleaf



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Figure 7—Dry meadow opening within Pacific silver fir forest. Dried inflorescence of Umpqua swertia appears in foreground along with numerous herbaceous species and grasses.

(*Paxistima myrsinites*), along with two species of fern: lace lipfern (*Cheilanthes gracillima*) and parsley fern (*Cryptogramma crispera*). A variety of minor vegetation types occupy the remaining 11 ha (27 ac) of the RNA (fig. 3).

The RNA supports some boreal and continental lichen taxa that are more typical of upper elevation, east Cascadian forests. Alectorioids dominate the old-growth stands; especially *Alectoria sarmentosa* and *Bryoria* spp. are especially abundant. Biomass of canopy lichens is comparable to lichen-rich old-growth forest of the midelevations in the central Cascades of Oregon. The RNA is generally above the zone of cyanolichen dominance in the Cascades. The occurrence of *Lobaria oregana* along the alder-willow (*Alnus-Salix*) thicket approaches the upper elevation limit for this species. Several microlichens present within the RNA are common in colder, drier habitats, including *Lecidea berengeriana* and *Lecanora circumborealis* (Neitlich and McCune 1995).

In recent decades, the RNA has been the focus of extensive inventory and survey activity. This activity has resulted in documentation of a high diversity of



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Figure 8—Flowering specimen of *Umpqua swertia*.

species being identified within the RNA. In total, 282 vascular plant taxa have been identified within the RNA. Table 3 summarizes the 482 total taxa identified within all life forms. Habitat diversity, lack of human disturbance, and past intensive surveys are reflected by high species richness in the area. Scientific and common names of vascular plants are listed in appendix 1. Similar lists for lichens (app. 2), bryophytes (app. 3), and fungi (app. 4) are also provided.

Table 3—Plant species richness by taxonomic group and growth form at Upper Elk Meadows Research Natural Area.

| Group | No. of taxa |
|---------------------------|-------------|
| Trees | 13 |
| Shrubs | 41 |
| Ferns | 6 |
| Herbs | 188 |
| Grasses and graminoids | 42 |
| Total | 290 |
| Lichens | 56 |
| Mosses | 76 |
| Liverworts | 16 |
| Fungi | 52 |

Fauna

Amphibians, reptiles, birds, and mammals known or expected to occur within the tract are listed in appendix 5. These lists have been derived from field observation (Curtis 1986, Maser 1973), published literature (Csuti et al. 1997), and on species distribution, life history characteristics, and availability of habitat within the RNA.

Disturbance History

A trail was constructed in 1868 between the Bohemia Mining District and Oakland, Oregon. This trail today is an aggregate-surfaced logging road and follows a portion of the Crouch and Hawley trail through the RNA. Upper Elk Meadows became a favorite camping site for people using this trail (USFS/BLM 2012).

During the 1970s, timber was cut on 8.5 ha (21 ac) in the northeast corner of the RNA. In subsequent years, some Pacific silver fir and grand fir have been killed by balsam wooly aphid (*Adelges piceae* Ratz.). The forest is susceptible to windthrow, particularly along the southern RNA edge adjacent to private timberland logged in the past 25 years (USFS/BLM 2012).

Research History

The following research and monitoring projects have been undertaken within Upper Elk Meadows RNA (Greene et al. 1986, USDI BLM 1983):

Curtis, A. 1986. Upper Elk Meadows Research Natural Area guidebook No. 18.

Hardman, A. 2010. Lichen and bryophyte field survey data (unpublished).

McCain, C.; Diaz, N. 2002. Field guide to the forested plant associations of the westside central Cascades of Northwest Oregon.

- Neitlich, P.; McCune, B. 1995. Lichen diversity in the upper Willamette and Siuslaw watersheds.
- Peck, D.L.; Griggs, A.B.; Schlicker, H.G.; Wells, F.G.; Dole, H.M. 1964. Geology of the central and northern parts of the western Cascade Range in Oregon.
- Schuller, R.; Greene, S.; Sawtelle, N.; Downing, G.; Curtis, A.; Widmer, M.; Turner, R. 2000. Vegetation monitoring data (unpublished).
- Schuller, R.; Greene, S. 2010. Vegetation monitoring data (unpublished).
- Widmer, M.; Walker, J. 1997–1998. Lichen, bryophyte, and fungi surveys of Upper Elk Meadows Research Natural Area (unpublished).
- Wilson, B.; Hipkins, V., Kaye, T. 2010. One taxon or two: are *Frasera umpquaensis* and *F. fastigiata* (Gentianaceae) distinct species?

Maps

Maps applicable to Upper Elk Meadows RNA: Topographic—Burnt Mountain, Oregon, 7.5 minute, 1:24,000 scale, 1986; Eugene BLM District transportation map, 1:63360 [no date].

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English Equivalents

| When you know: | Multiply by: | To find: |
|---------------------------------|--------------|----------------------|
| Millimeters (mm) | 0.394 | Inches |
| Centimeters (cm) | 0.394 | Inches |
| Meters (m) | 3.28 | Feet |
| Kilometers (km) | 0.621 | Miles |
| Square meters (m ²) | 10.76 | Square feet |
| Hectares (ha) | 2.47 | Acres |
| Degrees Fahrenheit (°F) | F-32/1.8 | Degrees Celsius (°C) |

References

- 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.
- Curtis, A. 1986.** Upper Elk Meadows Research Natural Area. Suppl. No. 18 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. 19 p.
- 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.
- Esslinger, T.L. 2010.** A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. Fargo, ND: North Dakota State University. <http://www.ndsu.edu/pubweb/~esslinge/chcklst/chcklst7.htm>. (December 18, 2011).
- Flora of North America. 1993+.** Partial nomenclature of vascular plants, ferns, and fern allies within Oregon. http://www.efloras.org/flora_page.aspx?flora_id=1. (December 10, 2011).
- 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.
- 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.
- Hardman, A. 2010.** Unpublished field survey data. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.

- Loring, S.; Whitridge, H. 2010.** Unpublished field survey data. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.
- Maser, C. 1973.** Tentative list of mammals, birds, amphibians and reptiles of proposed Upper Elk Meadows Research Natural Areas. Unpublished report. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.
- McCain, C.; Christy, J.A. 2005.** Field guide to riparian plant communities in northwestern Oregon. Tech. Paper R6-NR-ECOL-TP-01-05. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 357 p.
- McCain, C.; Diaz, N. 2002.** Field guide to the forested plant associations of the westside central Cascades of northwest Oregon. Tech. Paper R6-NR-ECOL-TP-02-02. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 403 p.
- Mycobank. 2011.** Fungal databases, nomenclature and species banks. <http://www.mycobank.org/MycTaxo.aspx?Link=T&Rec=101927>. (December 17, 2011).
- Neitlich, P.; McCune, B. 1995.** Lichen diversity in the upper Willamette and Siuslaw watersheds Eugene District Bureau of Land Management. Unpublished report. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.
- Oregon Flora Project. 2011.** The Oregon plant atlas. <http://www.oregonflora.org/oregonplantatlas.html>. (December 1, 2011).
- Oregon Natural Heritage Advisory Council [ONHAC]. 2010.** Oregon Natural Areas Plan. Oregon Biodiversity Information Center, Institute for Natural Resources—Portland. Portland, OR: Portland State University. 198 p.
- Peck, D.L.; Griggs, A.B.; Schlicker, H.G.; Wells, F.G.; Dole, H.M. 1964.** Geology of the central and northern parts of the western Cascade Range in Oregon. U.S. Geological Survey Prof. Paper 449. Washington, DC: U.S. Government Printing Office. 56 p.
- Schuller, R.; Greene, S. 2008.** Unpublished monitoring data. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.

- Schuller, R.; Greene, S.; Sawtelle, N.; Downing, G.; Curtis, A.; Widmer, M.; Turner, R. 2000.** Unpublished monitoring data. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.
- U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Bureau of Land Management [USFS/BLM]. 2012.** Research natural areas—list of sites. Upper Elk Meadows. <http://www.fsl.orst.edu/rna/sites/upelkmea.htm>. (January 4, 2012).
- U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Bureau of Land Management [USFS/BLM]. 2011.** BLM OR/WA State Director Special Status Species List December 1, 2011. Includes federal TEP and OR/WA State Director Sensitive Species, and Strategic Species. <http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy>. (December 27, 2011).
- U.S. Department of Agriculture, Natural Resources Conservation Service [USDA NRCS]. 2011.** PLANTS database. <http://plants.usda.gov/java/.usda.gov/java/>. (December 11, 2011).
- U.S. Department of Agriculture, Natural Resources Conservation Service [USDA NRCS]. 2012.** Soil maps from Douglas County, Oregon. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. (January 5, 2012).
- U.S. Department of the Interior, Bureau of Land Management [USDI BLM]. 1983.** Upper Elk Meadows Research Natural Area management plan. Unpublished report. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477. 5 p.
- U.S. Department of the Interior, Bureau of Land Management [USDI BLM]. 1995.** Record of Decision and Resource Management Plan. Eugene, OR. 263 p.
- U.S. Department of the Interior, Bureau of Land Management [USDI BLM]. 2011.** Unpublished document. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.
- Widmer, M.; Walker, J. 1997–1998.** Lichen, bryophyte, and fungi surveys of Upper Elk Meadows Research Natural Area. Unpublished document. On file with: U.S. Department of the Interior, Bureau of Land Management, Eugene District, 3106 Pierce Parkway, Suite E, Springfield, OR 97477.

Wilson, B.L.; Hipkins, V.; Kaye, T.N. 2010. One taxon or two: Are *Frasera umpquaensis* and *F. fastigiata* (Gentianaceae) distinct species? *Madroño*. 57: 106–119.

Wilson, T.M.; Schuller, R.; Holmes, R.; Pavola, C.; Fimbel, R.A.; McCain, C.N.; Gamon, J.G.; Speaks, P.; Seevers, J.I.; DeMeo, T.E.; Gibbons, S. 2009. Interagency strategy for the Pacific Northwest Natural Areas Network. Gen. Tech. Rep. PNW-GTR-798. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 33 p.

Appendix 1—Plants^{1 2}

| Scientific name | Common name |
|---|------------------------|
| Coniferous trees: | |
| <i>Abies amabilis</i> (Dougl. ex Loud.) Dougl. ex Forbes | Pacific silver fir |
| <i>Abies grandis</i> (Dougl. ex D. Don) Lindl. | Grand fir |
| <i>Calocedrus decurrens</i> (Torr.) Florin | Incense cedar |
| <i>Pinus monticola</i> Dougl. ex D. Don | Western white pine |
| <i>Pseudotsuga menziesii</i> (Mirbel) Franco | Douglas-fir |
| <i>Taxus brevifolia</i> Nutt. | Western yew |
| <i>Thuja plicata</i> Donn. | Western redcedar |
| <i>Tsuga heterophylla</i> (Raf.) Sarg. | Western hemlock |
| Deciduous trees >8 m (26.3 ft) tall: | |
| <i>Alnus viridis</i> (Chaix) DC. ssp. <i>sinuata</i> (Regel) A. Löve & D. Löve | Sitka alder |
| <i>Chrysolepis chrysophylla</i> (Dougl. ex Hook.) Hjelmq. | Giant chinquapin |
| <i>Populus trichocarpa</i> T. & G. | Black cottonwood |
| <i>Prunus emarginata</i> (Dougl. ex Hook.) D. Dietr. | Bitter cherry |
| <i>Pyrus fusca</i> (Raf.) C.K. Schneid. | Oregon crab apple |
| Tall shrubs 2 to 8 m (6.6 to 26.3 ft) tall: | |
| <i>Acer circinatum</i> Pursh | Vine maple |
| <i>Acer glabrum</i> Torr. var. <i>douglasii</i> (Hook.) Dippel | Douglas maple |
| <i>Amelanchier alnifolia</i> (Nutt.) Nutt. ex M. Roem. | Saskatoon serviceberry |
| <i>Cornus sericea</i> L. ssp. <i>occidentalis</i> (T. & G.) Fosb. | Redosier dogwood |
| <i>Corylus cornuta</i> Marsh. var. <i>californica</i> (A. DC.) Sharp | California hazelnut |
| <i>Crataegus suksdorfii</i> (Sarg.) Kruschke | Suksdorf's hawthorn |
| <i>Holodiscus discolor</i> (Pursh) Maxim. | Oceanspray |
| <i>Rhamnus purshiana</i> DC. | Cascara |
| <i>Rhododendron macrophyllum</i> D. Don ex G. Don | Pacific rhododendron |
| <i>Salix geeyeriana</i> Anders. | Geyer willow |
| <i>Salix geeyeriana</i> <i>Xsitchensis</i> | hybrid willow |
| <i>Salix scouleriana</i> Barratt ex Hook | Scouler's willow |
| <i>Salix sitchensis</i> Sans. ex Bong. | Sitka willow |
| <i>Sambucus mexicana</i> Tapiro | Blue elderberry |
| <i>Sambucus racemosa</i> L. var. <i>arborescens</i> (Torr. & Gray) Gray | Red elderberry |
| <i>Sorbus sitchensis</i> M. Roem. | Western mountain ash |
| Medium shrubs 0.5 to 2 m (1.6 to 6.6 ft) tall: | |
| <i>Betula glandulosa</i> Michx. | Resin birch |
| <i>Cytisus scoparius</i> (L.) Link | Scotch broom |
| <i>Gaultheria ovatifolia</i> Gray | Western teaberry |
| <i>Gaultheria shallon</i> Pursh | Salal |
| <i>Lonicera involucrata</i> (Richards.) Banks ex Spreng. | Twinberry honeysuckle |
| <i>Paxistima myrsinites</i> (Pursh) Raf. | Oregon boxleaf |
| <i>Ribes binominatum</i> A. Heller | Ground gooseberry |
| <i>Ribes bracteosum</i> Dougl. ex Hook. | Stink currant |
| <i>Ribes lacustre</i> (Pers.) Poir. | Prickly currant |
| <i>Ribes sanguineum</i> Pursh | Red-flowering currant |

| Scientific name | Common name |
|---|-----------------------------|
| <i>Ribes triste</i> Pall. | Red currant |
| <i>Rosa gymnocarpa</i> Nutt. | Baldhip rose |
| <i>Rubus armeniacus</i> Focke | Himalayan blackberry |
| <i>Rubus leucodermis</i> Dougl. ex Torr. & A. Gray | Whitebark raspberry |
| <i>Rubus parviflorus</i> Nutt. | Thimbleberry |
| <i>Rubus spectabilis</i> Pursh | Salmonberry |
| <i>Symphoricarpos albus</i> (L.) S.F. Blake | Common snowberry |
| <i>Symphoricarpos mollis</i> Nutt. | Creeping snowberry |
| <i>Vaccinium membranaceum</i> Dougl. ex Torr. | Thinleaf huckleberry |
| <i>Vaccinium parvifolium</i> Sm. | Red huckleberry |
| Low shrubs <0.5 m (1.6 ft) tall: | |
| <i>Berberis nervosa</i> Pursh | Oregongrape |
| <i>Lonicera ciliosa</i> (Pursh) Poir. ex DC. | Orange honeysuckle |
| <i>Rubus laciniatus</i> Willd. | Cutleaf blackberry |
| <i>Rubus lasiococcus</i> Gray | Roughfruit berry |
| <i>Rubus ursinus</i> Cham. & Schlecht. | California dewberry |
| Ferns: | |
| <i>Athyrium filix-femina</i> (L.) Roth. | Lady fern |
| <i>Cheilanthes gracillima</i> D.C. Eaton | Lace lipfern |
| <i>Cryptogramma acrostichoides</i> R. Br. | American rockbrake |
| <i>Dryopteris expansa</i> (C. Presl) Fraser-Jenkins & Jermy | Spreading woodfern |
| <i>Polystichum munitum</i> (Kaulf.) Presl | Western swordfern |
| <i>Pteridium aquilinum</i> (L.) Kuhn | Bracken fern |
| Herbs: | |
| <i>Achillea millefolium</i> L. | Common yarrow |
| <i>Achlys triphylla</i> (Sm.) DC. | Vanilla leaf; deer foot |
| <i>Aconitum columbianum</i> Nutt. | Columbian monkshood |
| <i>Actaea rubra</i> (Ait.) Willd. | Red baneberry |
| <i>Adenocaulon bicolor</i> Hook. | American trailplant |
| <i>Agoseris aurantiaca</i> (Hook.) Greene | Orange agoseris |
| <i>Allotropa virgata</i> Torr. & Gray ex Gray | Sugarstick |
| <i>Anagallis arvensis</i> L. | Scarlet pimpernel |
| <i>Anaphalis margaritacea</i> (L.) B. & H. | Pearly everlasting |
| <i>Anemone deltoidea</i> Hook. | Columbian windflower |
| <i>Anemone lyallii</i> Britt. | Little mountain thimbleweed |
| <i>Angelica arguta</i> Nutt. | Lyall's angelica |
| <i>Angelica genuflexa</i> Nutt. | Kneeling angelica |
| <i>Antennaria luzuloides</i> T. & G. | Rush pussytoes |
| <i>Aquilegia formosa</i> Fisch. | Red columbine |
| <i>Arabis glabra</i> (L.) Bernh. | Tower rockcress |
| <i>Arnica amplexicaulis</i> Nutt. | Clasping arnica |
| <i>Asarum caudatum</i> Lindl. | Wild ginger |
| <i>Barbarea orthoceras</i> Ledeb. | American yellowrocket |
| <i>Bistorta bistortoides</i> Pursh | American bistort |
| <i>Botrychium minganense</i> Victorin | Mingan moonwort |
| <i>Botrychium multifidum</i> (Gmel.) Rupr. | Leathery grapefern |
| <i>Boykinia occidentalis</i> Torr. & Gray | Coastal brookfoam |
| <i>Callitriche hermaphroditica</i> L. | Northern water starwort |
| <i>Callitriche heterophylla</i> Pursh | Twoheaded water-starwort |

| Scientific name | Common name |
|--|------------------------------|
| <i>Caltha leptosepala</i> DC. | White marsh marigold |
| <i>Calypso bulbosa</i> (L.) Oakes | Fairy slipper |
| <i>Calystegia atriplicifolia</i> Hallier f. ssp. <i>atriplicifolia</i> | Nightblooming false bindweed |
| <i>Camassia quamash</i> (Pursh) Greene | Small camas |
| <i>Camassia leichtlinii</i> (Baker) Wats. | Large camas |
| <i>Campanula scouleri</i> Hook. ex DC. | Pale bellflower |
| <i>Canadanthus modestus</i> (Lindl.) G.L. Nesom | Giant mountain aster |
| <i>Cardamine breweri</i> S. Wats. | Brewer's bittercress |
| <i>Cardamine nuttallii</i> Greene var. <i>nuttallii</i> | Palmate toothwort |
| <i>Castilleja miniata</i> Dougl. ex Hook. | Giant red Indian paintbrush |
| <i>Centaureum erythraea</i> Rafn. | European centaury |
| <i>Chamerion angustifolium</i> (L.) Holub ssp. <i>circumvagum</i> (Mosq.) Hoch | Fireweed |
| <i>Chamerion latifolium</i> (L.) Holub | Dwarf fireweed |
| <i>Cheilanthes gracillima</i> Eat. | Lace lipfern |
| <i>Chimaphila menziesii</i> (R. Br. ex D. Don) Spreng. | Little prince's pine |
| <i>Chimaphila umbellata</i> (L.) W. Bartr. ssp. <i>occidentalis</i> (Rydb.) Hultén | Pipsissewa |
| <i>Cicuta douglasii</i> (DC.) J.M. Coult. & Rose | Western water hemlock |
| <i>Circaea alpina</i> L. | Alpine circaea |
| <i>Cirsium arvense</i> (L.) Scop. | Canada thistle |
| <i>Cirsium vulgare</i> (Savi) Ten. | Bull thistle |
| <i>Claytonia cordifolia</i> S. Wats. | Heartleaf springbeauty |
| <i>Claytonia parviflora</i> Dougl. ex Hook. ssp. <i>parviflora</i> | Streambank springbeauty |
| <i>Claytonia sibirica</i> (L.) Howell | Siberian miner's lettuce |
| <i>Clintonia uniflora</i> (Menzies ex Schult. & Schult. f.) Kunth | Bride's bonnet |
| <i>Collomia heterophylla</i> Dougl. ex Hook. | Variableleaf collomia |
| <i>Coptis laciniata</i> Gray | Oregon goldenthread |
| <i>Collinsia parviflora</i> Lindl. | Maiden blue-eyed Mary |
| <i>Collomia heterophylla</i> Dougl. ex Hook. | Variableleaf collomia |
| <i>Coptis laciniata</i> A. Gray | Oregon goldthread |
| <i>Corallorrhiza maculata</i> (Raf.) Raf. var. <i>maculata</i> | Spotted coralroot |
| <i>Corallorrhiza mertensiana</i> Bong. | Pacific coralroot |
| <i>Cornus canadensis</i> L. | Bunchberry dogwood |
| <i>Crepis capillaris</i> (L.) Wallr. | Smooth Hawksbeard |
| <i>Cynoglossum grande</i> Dougl. ex Lehm. | Pacific hound's-tongue |
| <i>Delphinium menziesii</i> DC. | Menzies' larkspur |
| <i>Dicentra formosa</i> (Andr.) Walpers | Pacific bleedingheart |
| <i>Digitalis purpurea</i> L. | Purple foxglove |
| <i>Epilobium brachycarpum</i> C. Presl | Tall willowherb |
| <i>Epilobium ciliatum</i> Raf. (Lehm.) ssp. <i>ciliatum</i> | Fringed willowherb |
| <i>Epilobium ciliatum</i> Raf. (Lehm.) ssp. <i>glandulosum</i> | Fringed willowherb |
| Hoch & P.H. Raven | |
| <i>Epilobium ciliatum</i> Raf. ssp. <i>watsonii</i> (Barbey) | Fringed willowherb |
| Hoch & P.H. Raven | |
| <i>Epilobium luteum</i> Pursh | Yellow willowherb |
| <i>Equisetum arvense</i> L. | Field horsetail |
| <i>Erigeron aliciae</i> Howell | Alice Eastwood's fleabane |
| <i>Eriophyllum lanatum</i> (Pursh) Forbes | Common woolly sunflower |

| Scientific name | Common name |
|--|------------------------------|
| <i>Erythronium grandiflorum</i> Pursh ssp. <i>grandiflorum</i> | Yellow avalanche-lily |
| <i>Erythronium oregonum</i> Appleg. | Giant white fawnlily |
| <i>Fragaria vesca</i> L. | Woodland strawberry |
| <i>Frasera umpquaensis</i> M. Peck & Applegate | Umpqua swertia |
| <i>Galium aparine</i> L. | Stickywilly |
| <i>Galium oreganum</i> Britt. | Oregon bedstraw |
| <i>Galium triflorum</i> Michx. | Fragrant bedstraw |
| <i>Goodyera oblongifolia</i> Raf. | Western rattlesnake plantain |
| <i>Heracleum lanatum</i> Bartr. | Common cowparsnip |
| <i>Hieracium albiflorum</i> Hook. | White-flowered hawkweed |
| <i>Hydrophyllum occidentale</i> (Wats.) Gray | Western waterleaf |
| <i>Hydrophyllum tenuipes</i> A. Heller | Slender-stem waterleaf |
| <i>Hypericum anagalloides</i> Cham. & Schldl. | Tinker's penny |
| <i>Hypericum formosum</i> Kunth | St. Johnswort |
| <i>Hypericum perforatum</i> L. | Common St. Johnswort |
| <i>Hypochaeris radicata</i> L. | Hairy cat's-ear |
| <i>Iris chrysophylla</i> Howell | Yellowleaf iris |
| <i>Lathyrus nevadensis</i> S. Watson ssp. <i>lanceolatus</i> (Howell) C.L. Hitchc. var. <i>pilosellus</i> (M. Peck) C.L. Hitchc. | Sierra pea |
| <i>Lathyrus polyphyllus</i> Nutt. | Leafy pea |
| <i>Leucanthemum vulgare</i> Lam. | Oxeye daisy |
| <i>Lilium columbianum</i> Leichtl. | Columbia lily |
| <i>Lilium washingtonianum</i> Kellogg | Washington lily |
| <i>Linnaea borealis</i> L. ssp. <i>longiflora</i> (Torr.) Hultén | Longtube twinflower |
| <i>Listera caurina</i> Piper | Northwestern twayblade |
| <i>Listera convallarioides</i> (Sw.) Nutt. ex Elliott | Broadlipped twayblade |
| <i>Lomatium martindalei</i> (J.M. Coult. & Rose) J.M. Coult. & Rose | Cascade desertparsley |
| <i>Lotus corniculatus</i> L. | Bird's-foot trefoil |
| <i>Lotus formosissimus</i> Greene | Seaside bird's-foot trefoil |
| <i>Lotus nevadensis</i> (Wats.) Greene | Nevada bird's-foot trefoil |
| <i>Lotus pinnatus</i> Hook. | Meadow bird's-foot trefoil |
| <i>Lotus purshianus</i> Clem. & E.G. Clem. | American bird's-foot trefoil |
| <i>Lupinus latifolius</i> Lindl. ex Agardh | Broadleaf lupine |
| <i>Lycopodium clavatum</i> L. | Running clubmoss |
| <i>Maianthemum racemosum</i> (L.) Link | Feathery false-Solomonseal |
| <i>Maianthemum stellatum</i> (L.) Desf. | Starry false-Solomonseal |
| <i>Mertensia ciliata</i> (James ex Torr.) G. Don | Tall fringed bluebells |
| <i>Mimulus dentatus</i> Nutt. ex Benth. | Coastal monkeyflower |
| <i>Mimulus guttatus</i> DC. | Common monkeyflower |
| <i>Mimulus moschatus</i> Dougl. ex Lindl. | Musk monkeyflower |
| <i>Mitella caulescens</i> Nutt. | Leafy miterwort |
| <i>Mitella ovalis</i> Greene | Coastal miterwort |
| <i>Mitella pentandra</i> Hook. | Fivestamen miterwort |
| <i>Moehringia macrophylla</i> (Hook.) Fenzl | Largeleaf sandwort |
| <i>Monotropa hypopithys</i> L. | Pinesap |
| <i>Montia chamissoi</i> Ledeb. ex Spreng. | Water minerslettuce |
| <i>Montia parvifolia</i> (Moc.) Greene | Streambank springbeauty |
| <i>Mycelis muralis</i> (L.) Dumort. | Wall-lettuce |
| <i>Nemophila heterophylla</i> Fisch. & C.A. Mey. | Small baby blue eyes |

| Scientific name | Common name |
|--|--------------------------|
| <i>Nemophila parviflora</i> Dougl. ex Benth. | Smallflower nemophila |
| <i>Oenanthe sarmentosa</i> C. Presl ex DC. | Water parsely |
| <i>Orthilia secunda</i> (L.) House | Sidebells wintergreen |
| <i>Osmorhiza berteroi</i> DC. | Sweetcicely |
| <i>Oxalis oregana</i> Nutt. | Oregon oxalis |
| <i>Pedicularis racemosa</i> Douglas ex Benth. | Sickletop lousewort |
| <i>Penstemon cardwellii</i> Howell | Cardwell's beardtongue |
| <i>Penstemon rattanii</i> Gray | Rattan's beardtongue |
| <i>Perideridia gairdneri</i> (Hook. & Arn.) Mathias | Gardner's yampah |
| <i>Perideridia oregana</i> (Wats.) Mathias | Oregon yampah |
| <i>Petasites frigidus</i> (L.) Fr. | Arctic sweet coltsfoot |
| <i>Phacelia linearis</i> (Pursh) Holz. | Threadleaf phacelia |
| <i>Phacelia nemoralis</i> Greene | Shade phacelia |
| <i>Phlox gracilis</i> (Hook.) Greene | Slender phlox |
| <i>Platanthera dilatata</i> (Pursh) Lindl. ex Beck var. <i>leucostachys</i> (Lindl.) Luer | Sierra bog orchid |
| <i>Platanthera stricta</i> Lindl. | Slender bog orchid |
| <i>Pleuricospora fimbriolata</i> Gray | Fringed pinesap |
| <i>Polemonium carneum</i> Gray | Royal Jacob's-ladder |
| <i>Polygonum minimum</i> Wats. | Broadleaf knotweed |
| <i>Polystichum munitum</i> (Kaulf.) C. Presl | Western swordfern |
| <i>Potentilla arguta</i> Pursh ssp. <i>convallaria</i> (Rydb.) Keck | Cream cinquefoil |
| <i>Potentilla glandulosa</i> Lindl. | Sticky cinquefoil |
| <i>Prosartes hookeri</i> Torr. | Drops-of-gold |
| <i>Prunella vulgaris</i> L. | Common selfheal |
| <i>Pterospora andromedea</i> Nutt. | Woodland pinedrops |
| <i>Pyrola asarifolia</i> Michx. | Liverleaf wintergreen |
| <i>Pyrola picta</i> Sm. | Whiteveined wintergreen |
| <i>Ranunculus uncinatus</i> D. Don ex G. Don | Woodland buttercup |
| <i>Rudbeckia occidentalis</i> Nutt. | Western coneflower |
| <i>Rumex acetosella</i> L. | Common sheep sorrel |
| <i>Rumex occidentalis</i> Wats. | Western dock |
| <i>Saxifraga bronchialis</i> L. ssp. <i>vespertina</i> (Small) Piper | Yellowdot saxifrage |
| <i>Saxifraga mertensiana</i> Bong. | Wood saxifrage |
| <i>Senecio jacobaea</i> L. | Tansy ragwort |
| <i>Senecio sylvaticus</i> L. | Woodland ragwort |
| <i>Senecio vulgaris</i> L. | Common groundsel |
| <i>Senecio triangularis</i> Hook. | Arrowleaf ragwort |
| <i>Sidalcea cusickii</i> Piper | Cusick's checkerbloom |
| <i>Spiranthes romanzoffiana</i> Cham. | Hooded ladies' tresses |
| <i>Stellaria calycantha</i> (Ledeb.) Bong. | Northern starwort |
| <i>Stachys chamissonis</i> Benth. var. <i>cooleyae</i> (A. Heller) G. Mulligan & D. Munro | Coastal hedgenettle |
| <i>Stachys palustris</i> L. | Marsh hedgenettle |
| <i>Stellaria borealis</i> Bigelow ssp. <i>sitchana</i> (Steud.) Piper | Sitka starwort |
| <i>Stellaria crispa</i> Cham. & Schldl. | Curled starwort |
| <i>Stellaria obtusa</i> Engelm. | Rocky Mountain chickweed |
| <i>Streptopus amplexifolius</i> (L.) DC. var. <i>amplexifolius</i> | Claspleaf twistedstalk |

| Scientific name | Common name |
|---|---------------------------|
| <i>Symphotrichum foliaceum</i> (Lindl. ex DC.) Nesom var. <i>parryi</i> (Eat.) Nesom | Parry's aster |
| <i>Synthyris reniformis</i> (Dougl. ex Benth.) Benth. | Snowqueen |
| <i>Taraxacum officinale</i> F.H. Wigg. | Common dandelion |
| <i>Thalictrum occidentale</i> A. Gray | Western meadowrue |
| <i>Tiarella trifoliata</i> L. var. <i>unifoliata</i> (Hook.) Kurtz | Coolwort foamflower |
| <i>Trautvetteria caroliniensis</i> (Walter) Vail | Carolina bugbane |
| <i>Trientalis borealis</i> Raf. ssp. <i>latifolia</i> (Hook.) Hultén | Broadleaf starflower |
| <i>Trifolium howellii</i> Wats. | Canyon clover |
| <i>Trifolium repens</i> L. | White clover |
| <i>Trillium albidum</i> J.D. Freeman | Giant white wakerobin |
| <i>Trillium ovatum</i> Pursh | Western trillium |
| <i>Urtica dioica</i> L. | Stinging nettle |
| <i>Vancouveria hexandra</i> (Hook.) Morr. & Dec. | Inside-out flower |
| <i>Veronica americana</i> Schwein. ex Benth. | American speedwell |
| <i>Veronica serpyllifolia</i> L. ssp. <i>humifusa</i> (Dicks.) Syme | Brightblue speedwell |
| <i>Veronica wormskjoldii</i> Roem. & Schult. | American alpine speedwell |
| <i>Vicia americana</i> Muhl. ex Willd. | American vetch |
| <i>Vicia sativa</i> L. | Garden vetch |
| <i>Viola glabella</i> Nutt. | Pioneer violet |
| <i>Viola sempervirens</i> Greene | Evergreen violet |
| <i>Xerophyllum tenax</i> (Pursh) Nutt. | Common beargrass |
| Grasses, sedges, and rushes: | |
| <i>Agrostis capillaris</i> L. | Colonial bentgrass |
| <i>Agrostis thurberiana</i> Vasey | Alpine bentgrass |
| <i>Bromus sitchensis</i> Trin. | Alaska brome |
| <i>Bromus vulgaris</i> (Hook.) Shear | Columbia brome |
| <i>Carex amplifolia</i> Boott | Bigleaf sedge |
| <i>Carex aquatilis</i> Wahlenb. | Water sedge |
| <i>Carex arcta</i> Boott | Northern clustered sedge |
| <i>Carex echinata</i> Murr. ssp. <i>echinata</i> | Star sedge |
| <i>Carex laeviculmis</i> Meinsh. | Smoothstem sedge |
| <i>Carex leptopoda</i> Mack. | Slender-foot sedge |
| <i>Carex luzulina</i> Olney | Woodrush sedge |
| <i>Carex multicosata</i> Mack. | Many-rib sedge |
| <i>Carex pachystachya</i> Cham. ex Steud. | Thick-headed sedge |
| <i>Carex rossii</i> Boott | Ross' sedge |
| <i>Carex vesicaria</i> L. | Inflated sedge |
| <i>Carex viridula</i> Michx. ssp. <i>viridula</i> | Green sedge |
| <i>Cinna latifolia</i> (Trevir. ex Göpp.) Griseb. | Drooping woodreed |
| <i>Dactylis glomerata</i> L. | Orchardgrass |
| <i>Danthonia californica</i> Bol. | California oatgrass |
| <i>Deschampsia elongata</i> (Hook.) Munro | Slender hairgrass |
| <i>Elymus glaucus</i> Buckl. | Blue wildrye |
| <i>Festuca occidentalis</i> Hook. | Western fescue |
| <i>Festuca rubra</i> L. | Red fescue |
| <i>Festuca subulata</i> Trin. | Bearded fescue |
| <i>Festuca subuliflora</i> Scribn. | Crinkleawn fescue |
| <i>Glyceria elata</i> (Nash) M.E. Jones | Tall mannagrass |
| <i>Juncus effusus</i> L. | Common rush |

| Scientific name | Common name |
|--|-------------------------|
| <i>Juncus ensifolius</i> Wikstr. | Swordleaf rush |
| <i>Juncus oxymiris</i> Engelm. | Pointed rush |
| <i>Juncus patens</i> E. May | Spreading rush |
| <i>Luzula comosa</i> E. May | Pacific woodrush |
| <i>Luzula divaricata</i> Wats. | Forked woodrush |
| <i>Luzula multiflora</i> (Ehrh.) Lej. var. <i>multiflora</i> | Common woodrush |
| <i>Luzula parviflora</i> (Ehrh.) Desv. | Small flowered woodrush |
| <i>Melica subulata</i> (Griseb.) Scribn. | Alaska oniongrass |
| <i>Phleum pratense</i> L. | Timothy |
| <i>Poa palustris</i> L. | Fowl bluegrass |
| <i>Poa pratensis</i> L. | Kentucky bluegrass |
| <i>Podagrostis humilis</i> (Vasey) Björkm. | Alpine bentgrass |
| <i>Schedonorus arundinaceus</i> (Schreb.) Dumort. | Tall fescue |
| <i>Scirpus microcarpus</i> J. Presl & C. Presl | Panicled bulrush |
| <i>Trisetum cernuum</i> Buckl. | Tall trisetum |

¹ Nomenclature for vascular plants, ferns, and fern-allies follows the Flora of North America (1993+), and Oregon Flora Project (2011) Web site. Common names are taken from the USDA NRCS - PLANTS Database (USDA NRCS 2011).

² Compiled from field observations of Curtis (1986), Loring and Whitridge (2010), Schuller and Greene (2008), and USDI BLM (2011).

Appendix 2—Lichens^{1 2}

| Species name | Authorities |
|----------------------------------|-------------------------------------|
| Macrolichens: | |
| <i>Alectoria sarmentosa</i> | Brodo & D. Hawksw. |
| <i>Bryoria capillaris</i> | (Ach.) Brodo & D. Hawksw. |
| <i>Bryoria friabilis</i> | Brodo & D. Hawksw. |
| <i>Bryoria fuscescens</i> | (Gyelnik) Brodo & D. Hawksw. |
| <i>Bryoria pseudofuscescens</i> | (Gyelnik) Brodo & D. Hawksw. |
| <i>Bryoria</i> sp. | Brodo & D. Hawksw. |
| <i>Cladonia chlorophaea</i> | (Flörke ex Sommerf.) Sprengel |
| <i>Cladonia fimbriata</i> | (L.) Fr. |
| <i>Cladonia ochrochlora</i> | Flörke |
| <i>Cladonia transcendens</i> | (Vainio) Vainio |
| <i>Hypogymnia apinnata</i> | Goward & McCune |
| <i>Hypogymnia enteromorpha</i> | (Ach.) Nyl. |
| <i>Hypogymnia imshaugii</i> | Krog |
| <i>Hypogymnia inactiva</i> | (Krog) Ohlsson |
| <i>Hypogymnia occidentalis</i> | L. Pike |
| <i>Hypogymnia physodes</i> | (L.) Nyl. |
| <i>Hypogymnia tubulosa</i> | (Schaerer) Hav. |
| <i>Letharia vulpina</i> | (L.) Hue |
| <i>Lobaria oregana</i> | (Tuck.) Müll. Arg. |
| <i>Lobaria pulmonaria</i> | (L.) Hoffm. |
| <i>Melanelia exasperatula</i> | (De Not.) O. Blanco et al. |
| <i>Melanelixia subaurifera</i> | (Nyl.) O. Blanco et al. |
| <i>Nodobryoria oregana</i> | (Tuck.) Common & Brodo |
| <i>Parmelia hygrophila</i> | Goward & Ahti |
| <i>Parmelia saxatilis</i> | (L.) Ach. |
| <i>Parmelia sulcata</i> | Taylor |
| <i>Parmeliopsis ambigua</i> | (Wulfen) Nyl. |
| <i>Parmeliopsis hyperopta</i> | (Ach.) Arnold |
| <i>Peltigera membranacea</i> | (Ach.) Nyl. |
| <i>Peltigera neopolydactyla</i> | (Gyelnik) Gyelnik |
| <i>Platismatia glauca</i> | (L.) W. L. Culb. & C. F. Culb. |
| <i>Platismatia herrei</i> | (Imshaug) W. L. Culb. & C. F. Culb. |
| <i>Platismatia stenophylla</i> | (Tuck.) W. L. Culb. & C. F. Culb. |
| <i>Pseudocyphellaria anomala</i> | Brodo & Ahti |
| <i>Ramalina farinacea</i> | (L.) Ach. |
| <i>Ramalina thrausta</i> | (Ach.) Nyl. |
| <i>Sphaerophorus globosus</i> | (Hudson) Vainio |
| <i>Usnea</i> sp. | Dill. ex Adans. |
| <i>Xanthomendoza mendozae</i> | (Räsänen) S. Kondr. & Kärnefelt |

| Species name | Authorities |
|-----------------------------------|---------------------------------|
| Crustose lichens and caliciales: | |
| <i>Amandinea punctata</i> | (Hoffm.) Coppins & Scheid. |
| <i>Calicium glaucellum</i> | Ach. |
| <i>Chaenotheca brunneola</i> | (Ach.) Müll. Arg. |
| <i>Cyphelium inquinans</i> | (Sm.) Trevisan |
| <i>Japewia tornøensis</i> | (Nyl.) Tønsberg |
| <i>Lecanora circumborealis</i> | Brodo & Vítik. |
| <i>Lecanora pulicaris</i> | (Pers.) Ach. |
| <i>Lecidia berengeriana</i> | (A. Massal.) Th. Fr. |
| <i>Lecidia efflorescens</i> | (Hedl.) Erichs. |
| <i>Lecidella elaeochroma</i> | (Ach.) M. Choisy |
| <i>Mycoblastus sanguinarius</i> | (L.) Norman |
| <i>Ochrolechia juvenalis</i> | Brodo |
| <i>Ochrolechia oregonensis</i> | H. Magn. |
| <i>Ochrolechia subpallenscens</i> | Verseghy |
| <i>Pertusaria ophthalmiza</i> | (Nyl.) Nyl. |
| <i>Pertusaria subambigens</i> | Dibben |
| <i>Xylographa parallela</i> | (Ach. : Fr.) Behlen & Desberger |

¹ Nomenclature for macrolichen and microlichen species follows Esslinger (2011).

² Compiled from field surveys by Hardman (2010), Neitlich and McCune (1995), and Widmer and Walker (1997–1998).

Appendix 3—Bryophytes^{1 2}

| Scientific name and authorities | Common name |
|--|-----------------------------|
| Mosses: | |
| <i>Andraea blytii</i> Schimp. | — |
| <i>Antitrichia curtispindula</i> (Hedw.) Brid. | California antitrichia moss |
| <i>Atrichum setwynii</i> Aust. | — |
| <i>Aulacomnium androgynum</i> (Hedw.) Schwägr. | Aulacomnium moss |
| <i>Brachythecium albicans</i> (Hedw.) Schimp. | Brachythecium moss |
| <i>Brachythecium frigidum</i> (Müll. Hal.) Besch. | Cold brachythecium moss |
| <i>Brachythecium starkei</i> (Brid.) Schimp. var. <i>pacificum</i> | Starke's brachythecium moss |
| <i>Brachythecium</i> Schimp sp. | — |
| <i>Bryum canariense</i> Brid. | Canary bryum moss |
| <i>Bryum weigelii</i> Spreng. | Weigel's bryum moss |
| <i>Bryum</i> sp. | — |
| <i>Bucklandiella heterosticha</i> (Hedw.) Bednarek-Ochyra & Ochyra | — |
| <i>Bucklandiella occidentalis</i> (Ren. & Card.) Bednarek-Ochyra & Ochyra | — |
| <i>Buxbaumia piperi</i> Best | Piper's buxbaumia moss |
| <i>Ceratodon purpureus</i> (Hedw.) Brid. | Ceratodon moss |
| <i>Claopodium crispifolium</i> (Hook.) Ren. & Card. | Claopodium moss |
| <i>Codriophorus acicularis</i> (Hedw.) Beauv. | — |
| <i>Codriophorus varius</i> (Mitt.) Bednarek-Ochyra & Ochyra | — |
| <i>Dichodontium pellucidum</i> (Hedw.) Schimp. | Dichodontium moss |
| <i>Dicranoweisia cirrata</i> (Hedw.) Lindb. ex Milde | Dicranoweisia moss |
| <i>Dicranum fuscescens</i> Turn. | Dicranum moss |
| <i>Dicranum howellii</i> Ren. & Card. | Howell's dicranum moss |
| <i>D. scoparium</i> Hedw. | Dicranum moss |
| <i>Dicranum tauricum</i> Sapeh. | Dicranum moss |
| <i>Ditrichum heteromallum</i> (Hedw.) E. Britt. | Ditrichum moss |
| <i>Drepanocladus aduncus</i> (Hedw.) Warnst. | Drepanocladus moss |
| <i>Eurhynchium oregonum</i> (Sull.) A. Jaeg. | Oregon eurhynchium moss |
| <i>Fontinalis antipyretica</i> Hedw. | Antifever fontinalis moss |
| <i>Fontinalis neomexicana</i> Sull. & Lesq. | New Mexico fontinalis moss |
| <i>Grimmia laevigata</i> (Brid.) Brid. | Grimmia dry rock moss |
| <i>Grimmia ramondii</i> (Lam. & DC) | Ramond's Grimmia moss |
| <i>Grimmia</i> sp. | — |
| <i>Heterocladium macounii</i> Best | Macoun's heterocladium moss |
| <i>Homalothecium megaptilum</i> (Sull.) Schof. | Trachybryum moss |
| <i>Hygroamblystegium tenax</i> (Hedw.) Jenn. | Hygroamblystegium moss |
| <i>Hygrohypnum ochraceum</i> (Turn. ex Wils.) Loeske | Hygrohypnum moss |
| <i>Hypnum circinale</i> Hook. | Hypnum moss |

| Scientific name and authorities | Common name |
|---|--------------------------------|
| <i>Isopterygiopsis pulchella</i> (Hedw.) Z. Iwats. | Isopterygiopsis moss |
| <i>Isothecium cristatum</i> (Hampe) H. Rob. | Isothecium moss |
| <i>Isothecium stoloniferum</i> Brid. group | Isothecium moss |
| <i>Kindbergia praelonga</i> (Hedw.) Ochyra | Eurhynchium moss |
| <i>Lescuraea baileyi</i> (Best & Grout) E. Lawt. | Bailey's pseudoleskea moss |
| <i>Leskea polycarpa</i> Ehrh. ex Hedw. | Leskea moss |
| <i>Leucolepis acanthoneura</i> (Schwägr.) Lindb. | Leucolepis moss |
| <i>Meiotrichum lyallii</i> (Mitt.) G.L. Merr. | Lyall's meiotrichum moss |
| <i>Metaneckera menziesii</i> (Drumm.) Steere | Menzies' metaneckera moss |
| <i>Mnium spinulosum</i> Bruch & Schimp. | Largetooth calcareous moss |
| <i>Neckera douglasii</i> Hook. | Douglas' neckera moss |
| <i>Niphotrichum elongatum</i> (Ehrh. ex Frisvoll) Bednarek-Ochyra & Ochyra | Elongate racomitrium moss |
| <i>Orthotrichum consimile</i> Mitt. | Orthotrichum moss |
| <i>Orthotrichum lyellii</i> Hook. & Taylor | Lyell's orthotrichum moss |
| <i>Philonotis fontana</i> (Hedw.) Brid. | Philonotis moss |
| <i>Plagiomnium insigne</i> (Mitt.) T. Kop. | Plagiomnium moss |
| <i>Plagiomnium venustum</i> (Mitt.) T. Kop. | Plagiomnium moss |
| <i>Pogonatum contortum</i> (Brid.) Lesq. | Contorted pogonatum moss |
| <i>Pohlia cruda</i> (Hedw.) Lindb. | Pohlia moss |
| <i>Pohlia</i> sp. | — |
| <i>Polytrichum juniperinum</i> Hedw. | Juniper polytrichum moss |
| <i>Polytrichum piliferum</i> Hedw. | Polytrichum moss |
| <i>Pseudoleskea stenophylla</i> Ren. & Card. | Pseudoleskea moss |
| <i>Pseudotaxiphyllum elegans</i> (Brid.) Z. Iwats. | Elegant pseudotaxiphyllum moss |
| <i>Ptilidium californicum</i> (Austin) Underw. | — |
| <i>Ptychostomum pseudotriquetrum</i> (Hedw.) J.R. Spence & H.P. Ramsay | — |
| <i>Rhizomnium glabrescens</i> (Kindb.) T. Kop. | Rhizomnium moss |
| <i>Rhizomnium magnifolium</i> (Horik.) T. Kop. | Grandleaf rhizomnium moss |
| <i>Rhytidiadelphus loreus</i> (Hedw.) Warnst. | Gooseneck moss |
| <i>Rhytidiadelphus squarrosus</i> (Hedw.) Warnst. | Square gooseneck moss |
| <i>Rhytidiadelphus triquetrus</i> (Hedw.) Warnst. | Rough gooseneck moss |
| <i>Rhytidiopsis robusta</i> (Hook.) Broth. | Robust rhytidiopsis moss |
| <i>Roellia roellii</i> (Broth.) Andrews ex H.A. Crum | Roell's moss |
| <i>Schistidium rivulare</i> (Brid.) Podp. | Streamside schistidium moss |
| <i>Scleropodium obtusifolium</i> (A. Jaeger) Kindb. | Obtuseleaf scleropodium moss |
| <i>Scleropodium touretii</i> (Brid.) L.F. Koch | Touret's scleropodium moss |
| <i>Syntrichia ruralis</i> (Hedw.) F. Weber & D. Mohr | Tortula moss |
| <i>Thamnobryum neckeroides</i> (Hook.) E. Lawt. | Necker's thamnobryum moss |
| <i>Tortula subulata</i> Hedw. | Tortula moss |
| <i>Ulota megalospora</i> Vent. | Largespore ulota moss |

| Scientific name and authorities | Common name |
|---|-------------|
| Liverworts: | |
| <i>Cephalozia bicuspidata</i> (L.) Dumort. | — |
| <i>Cephalozia lunulifolia</i> (Dumort.) Dumort. group | — |
| <i>Chiloscyphus polyanthos</i> (L.) Corda | — |
| <i>Conocephalum</i> cf. <i>conicum</i> (L.) Dumort. | — |
| <i>Geocalyx graveolens</i> (Schrad.) Nees | — |
| <i>Lepidozia reptans</i> (L.) Dumort. | — |
| <i>Lophozia incise</i> (Schrad.) Dumort. | — |
| <i>Lophozia ventricosa</i> (Dicks.) Dumort. | — |
| <i>Marchantia polymorpha</i> L. | — |
| <i>Marsupella emarginata</i> (Ehrh.) Dumort. | — |
| <i>Porella navicularis</i> (Lehm. & Lindenb.) Lindb. | — |
| <i>Radula bolanderi</i> Gottsche | — |
| <i>Riccardia</i> sp. | — |
| <i>Scapania bolanderi</i> Austin | — |
| <i>Scapania umbrosa</i> (Schrad.) Dumort. | — |
| <i>Scapania undulata</i> (L.) Dumort. | — |

— = no common name available.

¹ Scientific nomenclature and common names follow USDI NRCSa (2011)

² Compiled from field surveys by Hardman (2010), USDI BLM (2011), and Widmer and Walker (1997–1998),

Appendix 4—Fungi^{1 2}

| Scientific name | Common name |
|---|-------------------------|
| <i>Amanita aspera</i> (Pers.) Pers. | Yellow-veiled amanita |
| <i>Armillariella mellea</i> (Vahl) P. Karst. | Honey mushroom |
| <i>Boletus edulis</i> Bull. | King bolete |
| <i>Boletus pulverulentus</i> Opat. | — |
| <i>Bondarzewia mesenterica</i> (Schaeff.) Kreisel | — |
| <i>Bovista plumbea</i> Pers. | Tumbling puffball |
| <i>Cantharellus formosus</i> Corner | Chanterelle |
| <i>Coltricia perennis</i> (L.) Murril | Fairy stool |
| <i>Crucibulum laeve</i> (Huds.) Kambly | Bird's nest fungus |
| <i>Fomitopsis pinicola</i> (Sw.) P. Karst. | Red-belted conk |
| <i>Fuligo septica</i> (L.) F.H. Wigg. | Scrambled-egg slime |
| <i>Ganoderma applanatum</i> (Pers.) Pat. | Artist's conk |
| <i>Gomphidius subroseus</i> Kauffman | Rosy gomphidius |
| <i>Gomphus bonarii</i> (Morse) Singer | — |
| <i>Gomphus clavatus</i> (Pers.) Gray | Pig's ears |
| <i>Gomphus floccosus</i> (Schwein.) Singer | Scaly chanterelle |
| <i>Gomphus kauffmanii</i> (A.H. Sm.) Corner | — |
| <i>Guepiniopsis alpina</i> (Tracy & Earle) Brasf. | Alpine jelly cone |
| <i>Gymnopilus spectabilis</i> (Weinm.) A.H. Sm. | Big laughing mushroom |
| <i>Hebeloma sinapizans</i> (Paulet) Gillet | Scaly-stalked Hebeloma |
| <i>Hericium abietis</i> (Weir ex Hubert) K.A. Harrison | Conifer coral mushroom |
| <i>Hygrophoropsis aurantiaca</i> (Wulfen) Maire | False chanterelle |
| <i>Hypomyces lactifluorum</i> (Schwein.) Tul. & C. Tul. | Lobster mushroom |
| <i>Inocybe sororia</i> Kauffman | Corn silk inocybe |
| <i>Laccaria amethystea</i> (Bull.) Murrill | Amethyst laccaria |
| <i>Lactarius deliciosus</i> (L.) Gray | Delicious milky cap |
| <i>Lactarius scrobiculatus</i> (Scop.) Fr. | Scrobulate milky cap |
| <i>Laetiporus sulphureus</i> (Bull.) Murrill | Chicken of the woods |
| <i>Lycogala epidendrum</i> (L.) Fr. | Wolf's milk slime |
| <i>Lycoperdon perlatum</i> Pers. | Common puffball |
| <i>Marasmiellus candidus</i> (Fr.) Singer | — |
| <i>Mycena haematopus</i> (Pers.) P. Kumm. | Bleeding Mycena |
| <i>Mycena murina</i> (Murrill) Murrill group | Yet another Mycena |
| <i>Mycena pura</i> (Pers.) P. Kumm. | Lilac Mycena |
| <i>Phaeolus schweinitzii</i> (Fr.) Pat. | Dyer's polypore |
| <i>Pleurotus porrigens</i> (Pers.) P. Kumm. | Angel wings |
| <i>Polyporus elegans</i> (Bull.) Trog | Elegant polypore |
| <i>Pseudohydnum gelatinosum</i> (Scop.) P. Karst | Toothed jelly fungus |
| <i>Ramaria stuntzii</i> Marr | Stuntz' coral mushroom |
| <i>Rozites caperatus</i> (Pers.) P. Karst. | Gypsy mushroom |
| <i>Russula bicolor</i> Burl. | — |
| <i>Russula brevipes</i> Peck | Short-stemmed russula |
| <i>Russula emetica</i> (Schaeff.) Pers. | Emetic russula |
| <i>Russula nigricans</i> Fr. | Rank russula |
| <i>Russula rosacea</i> (Pers.) Gray | Rosy russula |
| <i>Russula xerampelina</i> (Schaeff.) Fr. | Shrimp russula |
| <i>Stropharia ambigua</i> (Peck) Zeller | Questionable stropharia |
| <i>Suillus lakei</i> (Murrill) A.H. Sm. & Thiers | Western painted Suillus |
| <i>Thelephora terrestris</i> Ehrh. | Earth fan |
| <i>Tricholoma flavovirens</i> (Pers.) S. Lundell | Man on horseback |
| <i>Tricholomopsis decora</i> (Fr.) Singer | — |
| <i>Tricholomopsis rutilans</i> (Schaeff.) Singer | Plums and custard |

— = no common name available.

¹ Nomenclature follows Mycobank (2011).

² Compiled from field surveys by USDI BLM (2011), and Widmer and Walker (1997–1998).

Appendix 5—Amphibians, Reptiles, Birds, and Mammals^{1 2 3}

| Family | Scientific name | Common name |
|--------------------------|--------------------------------|----------------------------------|
| Reptiles and amphibians: | | |
| Ambystomatidae | <i>Ambystoma gracile</i> | Northwestern salamander |
| Dicamptodontidae | <i>Dicamptodon tenebrosus</i> | Pacific giant salamander |
| | <i>Rhyacotriton variegatus</i> | Southern torrent salamander |
| Plethodontidae | <i>Ensatina eschscholtzii</i> | Ensatina |
| | <i>Plethodon dunni</i> | Dunn's salamander |
| Salamandridae | <i>Taricha granulosa</i> | Roughskin newt |
| Bufo | <i>Bufo boreas</i> | Western toad |
| Ranidae | <i>Rana aurora</i> | Red-legged frog |
| | <i>Rana boylei</i> | Foothill yellow-legged frog |
| | <i>Rana cascadae</i> | Cascades frog |
| Anguillidae | <i>Elgaria coerulea</i> | Northern alligator lizard |
| Boidae | <i>Charina bottae</i> | Rubber boa |
| Colubridae | <i>Thamnophis elegans</i> | Western terrestrial garter snake |
| | <i>Thamnophis sirtalis</i> | Common garter snake |
| Birds: | | |
| Cathartidae | <i>Cathartes aura</i> | Turkey vulture |
| Accipitridae | <i>Accipiter cooperii</i> | Cooper's hawk |
| | <i>Accipiter gentilis</i> | Northern goshawk |
| | <i>Accipiter striatus</i> | Sharp-shinned hawk |
| | <i>Buteo jamaicensis</i> | Red-tailed hawk |
| Phasianidae | <i>Bonasa umbellus</i> | Ruffed grouse |
| | <i>Dendragapus obscurus</i> | Blue grouse |
| Columbidae | <i>Columba fasciata</i> | Band-tailed pigeon |
| Strigidae | <i>Aegolius acadicus</i> | Northern saw-whet owl |
| | <i>Bubo virginianus</i> | Great horned owl |
| | <i>Glaucidium gnoma</i> | Northern pygmy-owl |
| | <i>Strix occidentalis</i> | Spotted owl |
| Apodidae | <i>Chaetura vauxi</i> | Vaux's swift |
| Trochilidae | <i>Selasphorus rufus</i> | Rufous hummingbird |
| | <i>Stellula calliope</i> | Calliope hummingbird |
| Picidae | <i>Colaptes auratus</i> | Northern flicker |
| | <i>Dryocopus pileatus</i> | Pileated woodpecker |
| | <i>Picoides villosus</i> | Hairy woodpecker |
| | <i>Sphyrapicus ruber</i> | Red-breasted sapsucker |
| Tyrannidae | <i>Contopus borealis</i> | Olive-sided flycatcher |
| | <i>Contopus sordidulus</i> | Western wood pewee |
| | <i>Empidonax hammondi</i> | Hammond's flycatcher |
| | <i>Empidonax traillii</i> | Willow flycatcher |
| Corvidae | <i>Corvus brachyrhynchos</i> | American crow |
| | <i>Corvus corax</i> | Common raven |
| | <i>Cyanocitta stelleri</i> | Steller's jay |
| Paridae | <i>Parus gambeli</i> | Mountain chickadee |
| Sittidae | <i>Sitta canadensis</i> | Red-breasted nuthatch |
| Certhiidae | <i>Certhia americana</i> | Brown creeper |
| Troglodytidae | <i>Troglodytes troglodytes</i> | Winter wren |

| Family | Scientific name | Common name |
|----------------------------|-----------------------------------|--------------------------|
| Muscicapidae | <i>Catharus guttatus</i> | Hermit thrush |
| | <i>Ixoreus naevius</i> | Varied thrush |
| | <i>Regulus satrapa</i> | Golden-crowned kinglet |
| | <i>Regulus calendula</i> | Ruby-crowned kinglet |
| | <i>Turdus migratorius</i> | American robin |
| Vireonidae | <i>Vireo huttoni</i> | Hutton's vireo |
| Emberizidae | <i>Agelaius phoeniceus</i> | Red-winged blackbird |
| | <i>Dendroica coronata</i> | Yellow-rumped warbler |
| | <i>Dendroica occidentalis</i> | Hermit warbler |
| | <i>Dendroica petechia</i> | Yellow warbler |
| | <i>Dendroica townsendi</i> | Townsend's warbler |
| | <i>Junco hyemalis</i> | Dark-eyed junco |
| | <i>Melospiza lincolnii</i> | Lincoln's sparrow |
| | <i>Piranga rubra</i> | Western tanager |
| | <i>Vermivora ruficapilla</i> | Nashville warbler |
| | <i>Wilsonia pusilla</i> | Wilson's warbler |
| | Fringillidae | <i>Carduelis pinus</i> |
| <i>Carpodacus cassinii</i> | | Cassin's finch |
| <i>Loxia curvirostra</i> | | Red crossbill |
| Mammals: | | |
| Didelphidae | <i>Didelphis virginiana</i> | Virginia opossum |
| Sorididae | <i>Sorex bendirii</i> | Pacific marsh shrew |
| | <i>Sorex pacificus</i> | Pacific shrew |
| | <i>Sorex palustris</i> | Water shrew |
| | <i>Sorex sonomae</i> | Fog shrew |
| | <i>Sorex trowbridgii</i> | Trowbridge's shrew |
| | <i>Sorex vagrans</i> | Vagrant shrew |
| Talpidae | <i>Neurotrichus gibbsii</i> | Shrew-mole |
| Vespertilionidae | <i>Eptesicus fuscus</i> | Big brown bat |
| | <i>Lasionycteris noctivagans</i> | Silver-haired bat |
| | <i>Lasiurus cinereus</i> | Hoary bat |
| | <i>Myotis volans</i> | Long-legged myotis |
| | <i>Myotis evotis</i> | Long-eared myotis |
| | <i>Plecotus townsendii</i> | Townsend's big-eared bat |
| | <i>Lepus americanus</i> | Snowshoe hare |
| Sciuridae | <i>Glaucomys sabrinus</i> | Northern flying squirrel |
| | <i>Tamias townsendii</i> | Townsend's chipmunk |
| | <i>Tamiasciurus douglasii</i> | Douglas' squirrel |
| Geomyidae | <i>Thomomys mazama</i> | Western pocket gopher |
| Muridae | <i>Clethrionomys californicus</i> | Western red-backed vole |
| | <i>Microtus longicaudus</i> | Long-tailed vole |
| | <i>Microtus oregoni</i> | Creeping vole |
| | <i>Microtus richardsonis</i> | Water vole |
| | <i>Microtus townsendii</i> | Townsend's vole |
| | <i>Neotoma cinerea</i> | Bushy-tailed woodrat |
| | <i>Peromyscus maniculatus</i> | Deer mouse |
| | <i>Phenacomys longicaudus</i> | Red tree vole |

| Family | Scientific name | Common name |
|----------------|----------------------------|-----------------------|
| Dipodidae | <i>Zapus princeps</i> | Western jumping mouse |
| | <i>Zapus trinotatus</i> | Pacific jumping mouse |
| Erethizontidae | <i>Erethizon dorsatum</i> | Common porcupine |
| Ursidae | <i>Ursus americanus</i> | Black bear |
| Procyonidae | <i>Procyon lotor</i> | Common raccoon |
| Mustelidae | <i>Martes americana</i> | American marten |
| | <i>Mustela frenata</i> | Long-tailed weasel |
| | <i>Martes pennanti</i> | Fisher |
| | <i>Mustela vison</i> | Mink |
| | <i>Spilogale gracilis</i> | Western spotted skunk |
| Felidae | <i>Felis concolor</i> | Mountain lion |
| | <i>Lynx canadensis</i> | Lynx |
| | <i>Lynx rufus</i> | Bobcat |
| Cervidae | <i>Cervus elaphus</i> | Elk |
| | <i>Odocoileus hemionus</i> | |
| | var. <i>columbianus</i> | Black-tailed deer |

— = no common names

¹ Compiled from field observations (Curtis 1986, Maser 1973), and from habitat descriptions and distribution maps in: Csuti et al. 1997. Atlas of Oregon wildlife. Corvallis, OR: Oregon State University Press. 492 p. + map.

² Nomenclature taken from Csuti et al. 1997.

³ Presence on list is based on known distribution, species' life histories, and available habitat.

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