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Fox Hollow Research Natural Area: Guidebook Supplement 44

Reid Schuller



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Cover photograph: Fox Hollow Research Natural Area. View of central, north-south trending ridge with Douglas-fir overstory and scattered, old-growth ponderosa pine. Photo by Reid Schuller.

Abstract

Schuller, Reid. 2013. Fox Hollow Research Natural Area: guidebook supplement 44. Gen. Tech. Rep. PNW-GTR-873. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 29 p.

This guidebook describes Fox Hollow Research Natural Area (RNA), a 66-ha (163-ac) area that supports dry-site Douglas-fir (*Pseudotsuga menziesii*)–ponderosa pine (*Pinus ponderosa*) forest within the Oregon Coast Range ecoregion. Major forest plant associations represented at Fox Hollow RNA include Douglas-fir/salal/western swordfern (*Pseudotsuga menziesii*/*Gaultheria shallon*/*Polystichum munitum*) forest and Douglas-fir/Oregongrape (*Pseudotsuga menziesii*/*Berberis nervosa*) forest. Other forested communities are represented within the RNA in minor amounts including: Douglas-fir/poison oak (*Pseudotsuga menziesii*/*Toxicodendron diversilobum*) forest, ponderosa pine-Douglas-fir/California fescue (*Pinus ponderosa*-*Pseudotsuga menziesii*/*Festuca californica*) woodland, and ponderosa pine-Douglas-fir-California black oak (*Pinus ponderosa*-*Pseudotsuga menziesii*-*Quercus kelloggii*) woodland.

Keywords: research natural area, area of critical environmental concern, old-growth ponderosa pine (*Pinus ponderosa*), Douglas-fir/salal/western swordfern plant association (*Pseudotsuga menziesii*/*Gaultheria shallon*/*Polystichum munitum*) plant association, Douglas-fir/Oregongrape (*Pseudotsuga menziesii*/*Berberis nervosa*) plant association, Douglas-fir/poison oak (*Pseudotsuga menziesii*/*Toxicodendron diversilobum*) plant association, ponderosa pine–Douglas-fir/California fescue (*Pinus ponderosa*-*Pseudotsuga menziesii*/*Festuca californica*) woodland, and ponderosa pine-Douglas-fir-California black oak (*Pinus ponderosa*-*Pseudotsuga menziesii*-*Quercus kelloggii*) woodland.

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.

Fox Hollow 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. The objectives for establishing research natural areas are to:

- Maintain a wide spectrum of high-quality areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and natural situations that have scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity.
- Preserve and maintain genetic diversity, including threatened, endangered, and sensitive species.
- Protect against human-caused environmental disruptions.
- Serve as reference areas for the study of natural ecological processes, including disturbance.
- Provide onsite and extension educational activities.
- Serve as baseline areas for measuring long-term ecological changes.
- Serve as control areas for comparing results from manipulative research.
- Monitor effects of resource management techniques and practices.

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 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>.

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.

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

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 Fox Hollow RNA 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 (see footnote 2).
- 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 RNA are not compromised.
- Provide information to scientists about other research occurring on the RNA so that potential collaborations may be fostered and conflicts avoided.
- Maintain records of research activities and research results to benefit the BLM, other agencies, and future researchers.

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.

⁵ For a discussion of management direction and strategies which guide research natural area management, see 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.

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Introduction

Fox Hollow Research Natural Area (RNA) is a 66-ha (163-ac) area located in Lane County, Oregon (fig. 1). The site was established in 1984 as an RNA (Curtis 1986), and the designation was reaffirmed by the Eugene District Resource Management Plan (USDI BLM 1995). A short guidebook was written for the area in 1986 (Curtis 1986). Since that time, additional information has been compiled for the area, including surveys of lichens (Netlich and McCune 1995, Stone 2009) and bryophytes (Stone 2009), and long-term vegetation monitoring (Schuller and Greene 2010). Preparation of a plant association guide for the westside central Oregon Cascade Range (McCain and Diaz 2002) provides an ecoregional framework from which native vegetation within the RNA may be evaluated. Publication of the Oregon Natural Areas Plan (ONHAC 2010) further elaborates upon the statewide significance of the biotic and physical features represented at Fox Hollow RNA.

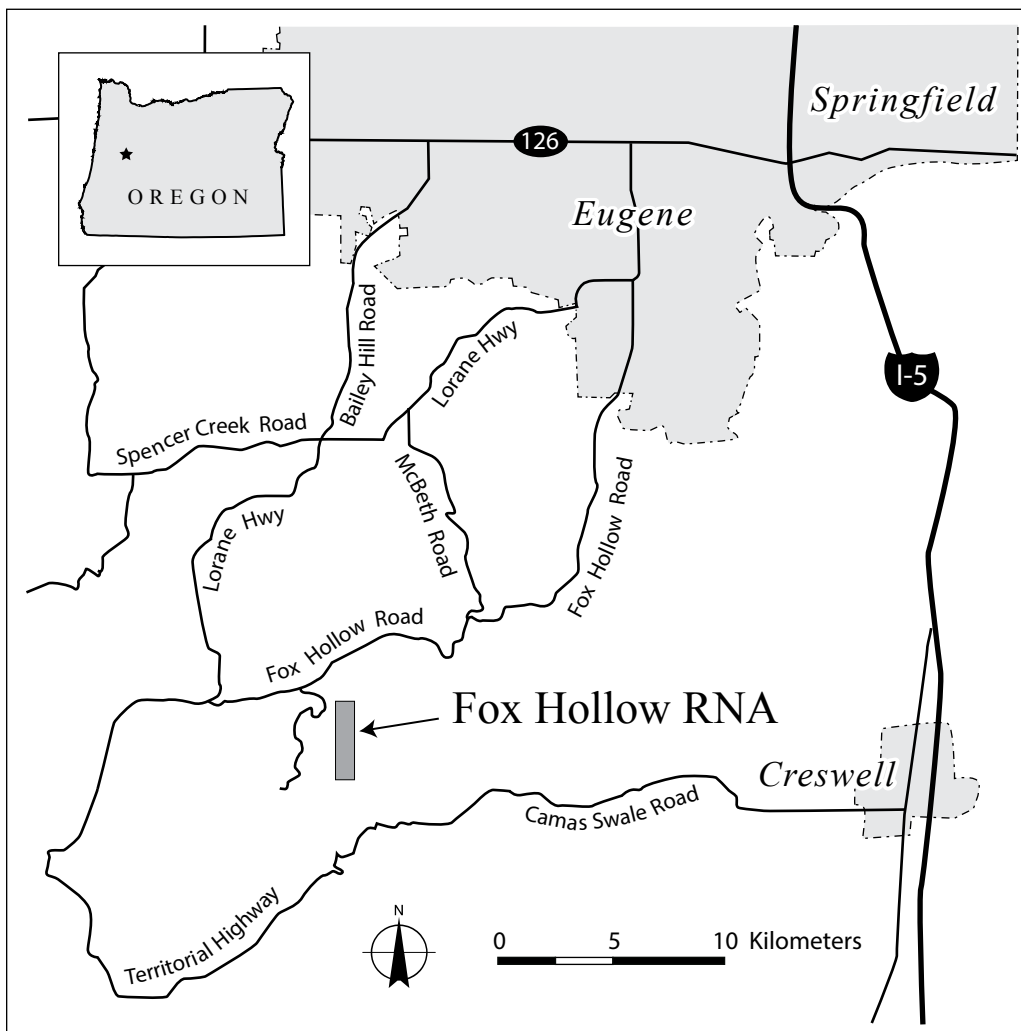


Figure 1—Fox Hollow Research Natural Area (RNA) location and access.

Using General Land Office records, Christy et al. (2009) reconstructed vegetation structural conditions circa 1850, which provides an historical reference condition from which vegetation changes up to the present may be assessed.

The primary rationale for designation of this site as an RNA is that it is a high-quality representation of dry-site Douglas-fir (*Pseudotsuga menziesii*)-ponderosa pine (*Pinus ponderosa*) forest within the Oregon Coast Range ecoregion (Dyrness et al. 1975) (see app. 1 for scientific and common names). The major forest plant associations represented at Fox Hollow RNA are further defined in the 2010 Natural Areas Plan (ONHAC 2010):

- Douglas-fir/salal/swordfern (*Pseudotsuga menziesii*/*Gaultheria shallon*/*Polystichum munitum*) forest
- Douglas-fir/Oregon grape (*Pseudotsuga menziesii*/*Berberis nervosa*) forest

In addition, minor amounts of the following forest types also occur within the RNA (ONHAC 2010):

- Douglas-fir/poison oak (*Pseudotsuga menziesii*/*Toxicodendron diversilobum*) forest
- Ponderosa pine-Douglas-fir/California fescue (*Pinus ponderosa*-*Pseudotsuga menziesii*/*Festuca californica*) woodland
- Ponderosa pine-Douglas-fir-California black oak (*Pinus ponderosa*-*Pseudotsuga menziesii*-*Quercus kelloggii*) woodland

Access and Accommodations

The RNA is located in Section 9, Township 19 South, R 4 West, Willamette Meridian, in Lane County, Oregon. The site is approximately 11.3 km (7 mi) west-northwest of the town of Creswell. To access the site from Eugene, proceed south on Bailey Hill Road to Lorane Highway. Take Lorane Highway south for 8 km (5 mi) to Fox Hollow Road. Turn left on Fox Hollow Road and proceed east for 2.4 km (1.5 mi) and turn right onto Bureau of Land Management (BLM) road 19-4-4, and continue east for 2.4 km (1.5 mi) to BLM road 19-4-9.1. This dirt road has a locked gate. Park at the nearest turnout and walk east along 19-4-9.1 about 1.2 km (0.75 mi), where the road ends at the southwest corner of the RNA (USDI BLM 1982a) (see fig. 3 on page 6).

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

Environment

The tract occupies the west slope of a divide that separates the drainage basins of the Willamette River and the Siuslaw River at the boundary between the Oregon Coast Range ecoregion and the Willamette Valley ecoregion (ONHAC 2010, USDI BLM 1982a, 1982b). Elevations range from 244 m (800 ft) on the western boundary to 366 m (1,200 ft) adjacent to the eastern boundary. A series of west-trending spur ridges radiate off the western flank of a north-south-oriented ridgeline. North- and south-facing slopes extending off the spur ridges provide topographic variation and habitat diversity (fig. 2). Headwaters of several intermittent streams flow west from the north-south ridgeline through the RNA.

Geologically, the RNA is mapped as Eocene age Fisher Formation composed of nonmarine water-deposited tuffs and conglomerates (Orr and Orr 1999). Soils are predominantly Bellpine silty clay loam derived from weathered sedimentary rocks and pyroclastics. Bedrock lies 51 to 102 cm (20 to 40 in) below the surface. These soils occur on nearly level ridgetops to approximately 50 percent slopes. Permeability is slow, runoff is medium, erosion hazard is moderate, and windthrow hazard is slight. All values increase on steeper slopes.

Three intermittent first- and second-order streams occur in west-facing ravines and periodically contain surface water (USDA NRCS 2011b, USDI BLM 2011).

Climate

The climate is Mediterranean and is characterized by hot, dry summers and cool, wet winters. From late fall through spring, unstable low-pressure air masses from the Pacific Ocean bring frequent storms, sometimes accompanied by high winds. Major windthrow damage occurs once or twice per decade. During the summer, stable high-pressure air masses bring generally clear skies and frequent temperature inversions. Temperatures are modified by the Pacific Ocean, in winter by its warming influence, and in summer by its cooling influence. Summer temperatures reduce relative humidity to 40 percent, and occasionally to 20 percent. Evapotranspiration at this time far exceeds available soil moisture, leading to drought especially on south- and west-facing exposures (Curtis 1986, USDI BLM 1982a, 1982b, WRCC 2011).

The nearest weather station is at the Eugene Airport, Oregon (352709), about 32 km (20 mi) northwest of the RNA at a slightly lower elevation. Extended periods of cloudiness and heavy periods of precipitation occur during the winter. About 70 percent of average annual precipitation falls from November through March. Precipitation occurs primarily as rain and averages 1145 mm (45.06 in) per year. Five

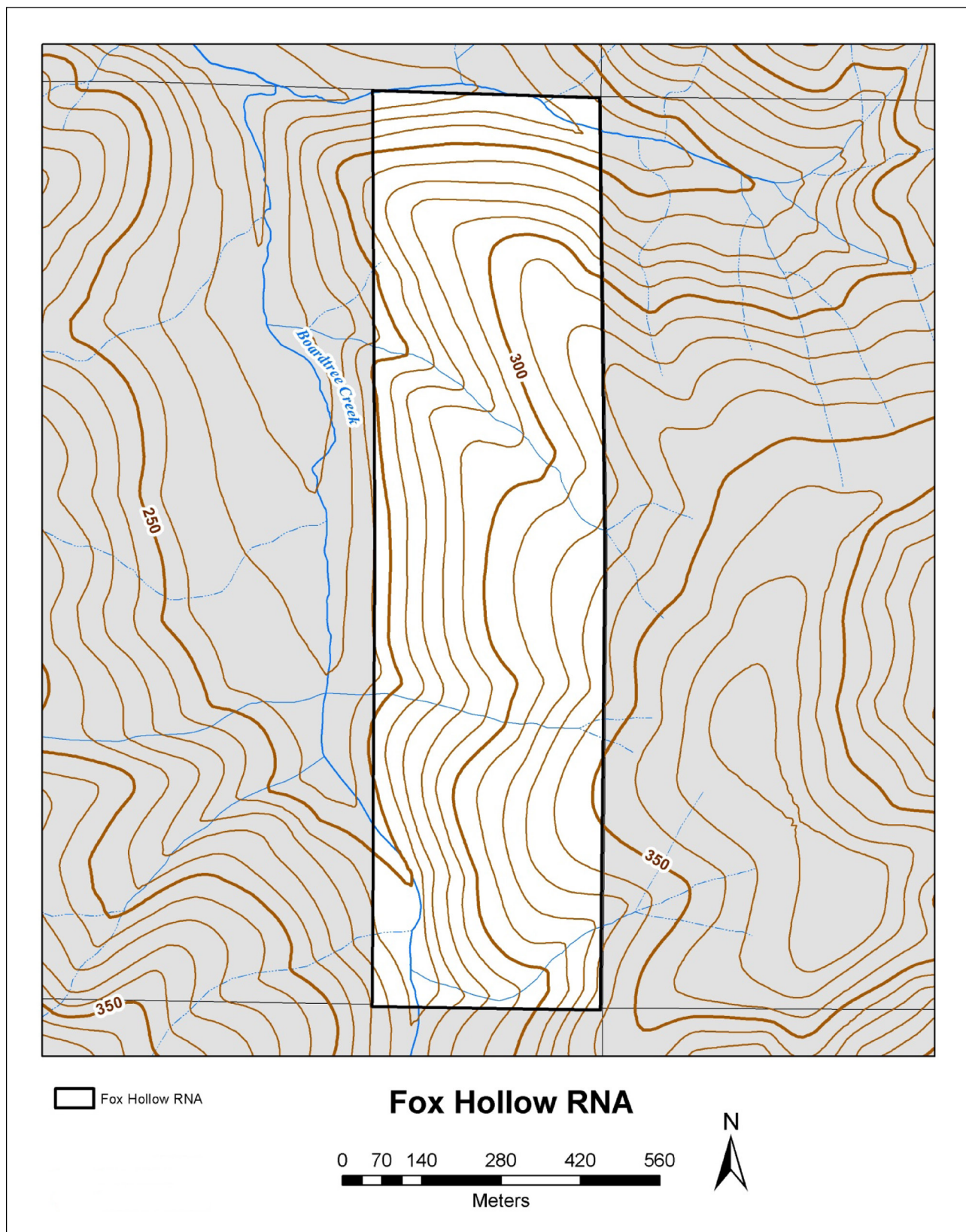


Figure 2—Fox Hollow Research Natural Area (RNA) topography and boundary.

percent of the average annual precipitation falls from June through August (Curtis 1986, WRCC 2010). Average annual snowfall is 152 mm (6 in). Climate parameters are in table 1.

Table 1—Temperature and precipitation summary^a

Parameter	Average
Minimum January temperature	0.8 °C (33.5 °F)
Maximum January temperature	7.9 °C (46.3 °F)
Minimum July temperature	10.8 °C (51.4 °F)
Maximum July temperature	28.0 °C (82.4 °F)
Annual precipitation	1145 mm (45.06 in)
June–August precipitation	63 mm (2.47 in)

^a Period of record: 12/01/1939 to 12/31/2009—Eugene WSO Airport, Oregon (352709).

Vegetation

The RNA is notable for dramatic differences in vegetation (fig. 3) occurring on its north- and south-facing slopes. A reconstruction of historical low- to mid-elevation forest conditions from the mid-19th century indicated the presence of (1) xeric Douglas-fir–chinquapin–Pacific madrone (“laurel”) (*Pseudotsuga menziesii*–*Chrysolepis chrysophylla*–*Arbutus menziesii*) forest on south to west slopes and ridgetops, and (2) more mesic Douglas-fir–Western redcedar (*Pseudotsuga menziesii*–*Thuja plicata*) forest on north slopes and in ravines (Christy et al. 2009). Today, the RNA is dominated by old-growth Douglas-fir, with many ponderosa pines occurring on the drier south-facing slopes and on ridgetops. Incense cedar (*Calocedrus decurrens*), Oregon white oak (*Quercus garryana*), California black oak (*Quercus kelloggii*), and western yew (*Taxus brevifolia*) occur in varying amounts in the forest understory and subcanopy. Grand fir (*Abies grandis*) is actively reproducing under the Douglas-fir canopy, especially on north-facing slopes. Western hemlock (*Tsuga heterophylla*) is notably absent from the area.

Four patches of ponderosa pine occupy ridgetops and south-facing slopes. Two of the largest ponderosa pines have been aged at 176 years, measuring 98 cm d.b.h.¹ and 183 years (112 cm d.b.h.). A slightly smaller Douglas-fir and incense cedar were aged at 145 and 143 years, respectively (Schuller and Green 2010).

Understory shrub cover on north-facing aspects includes vine maple (*Acer circinatum*), oceanspray (*Holodiscus discolor*), and Oregongrape. Ridgetops and southerly exposures are typically more sparsely vegetated, but often support greater plant species diversity. Typical dry-site shrubs include California hazelnut (*Corylus cornuta* var. *californica*), poison oak, oceanspray (*Holodiscus discolor*), and salal.

¹ “d.b.h.” refers to diameter at breast height, a measurement taken at 1.47 m above the ground.

The RNA is notable for dramatic differences in vegetation occurring on its north- and south-facing slopes.

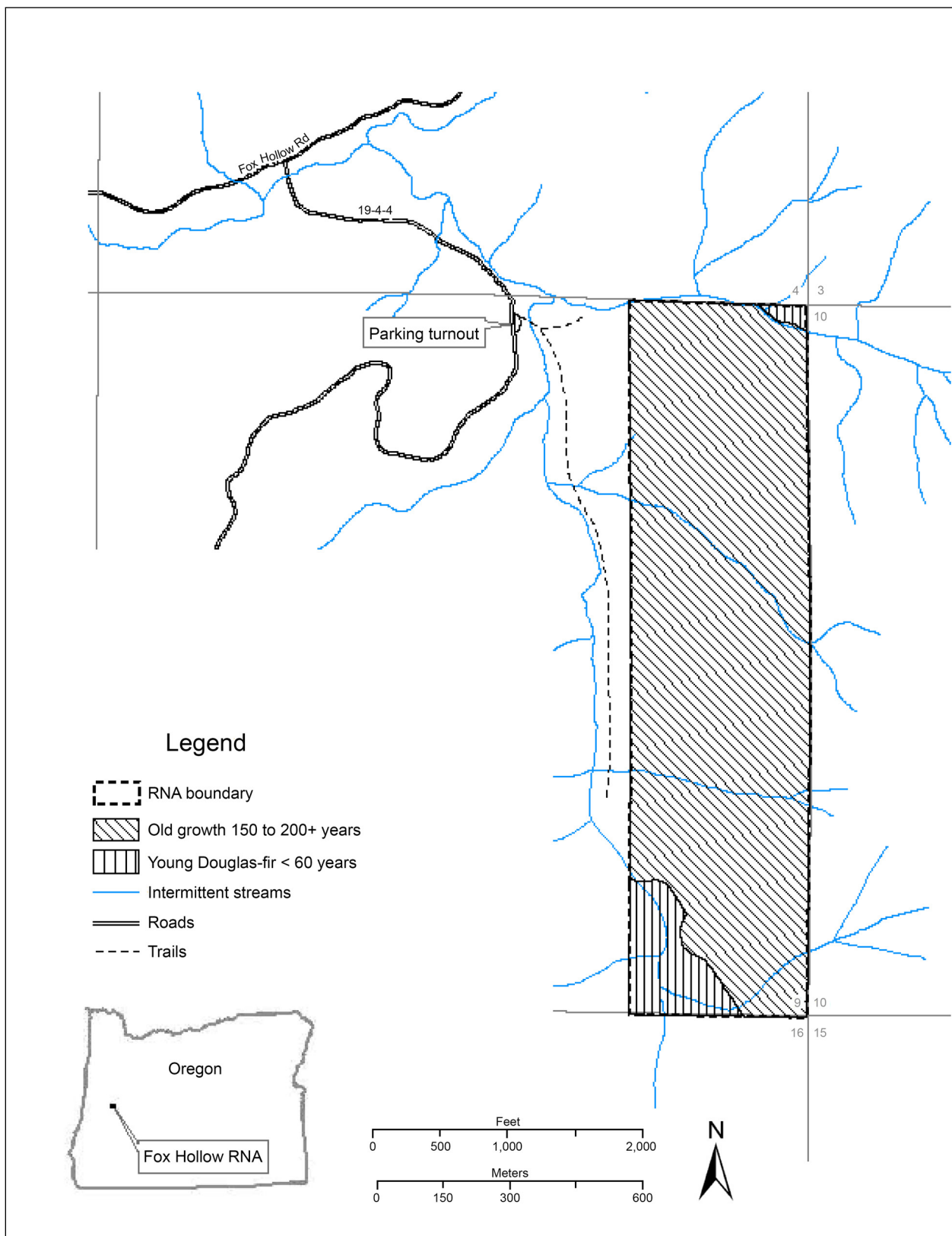


Figure 3—Fox Hollow Research Natural Area (RNA) vegetation and hydrology.

Herbaceous vegetation is represented by western swordfern and sweetcicely (*Osmorhiza berteroi*), especially on the more mesic sites. American trailplant (*Adenocaulon bicolor*), twinflower (*Linnaea borealis*), snowqueen (*Synthyris reniformis*), broadleaf starflower (*Trientalis borealis* ssp. *latifolia*), and bedstraw (*Galium* spp.) characterize the herbaceous layer in slightly drier conditions. Grasses occur frequently, but with low cover. Typical species are western fescue (*Festuca occidentalis*) and Alaska oniongrass (*Melica subulata*) (table 2).

Four, 1000-m² (0.247 ac) circular plots were established in 2000 and remeasured in 2010 to monitor change in vegetation structure and composition over time (table 2). Data were also used to classify plot vegetation into forest plant associations² (Schuller and Greene 2010). Plots were located within the Douglas-fir/poison oak association and the Douglas-fir/oceanspray-snowberry association (table 2). Figure 4 shows a representative example of grand fir regeneration beneath a Douglas-fir canopy on an upper-elevation bench. More mesic conditions support a dense shrub layer that includes California hazelnut and oceanspray, along with western swordfern (fig. 5). Slightly more xeric sites within the RNA are dominated by Douglas-fir and widely scattered, old-growth ponderosa pine. These areas have a low shrub cover; herbaceous species occur with a moderate cover and higher diversity (fig. 6).

Scientific and common names for vascular plants, lichens, bryophytes, and fungi known to occur within the RNA are listed in appendixes 1, 2, 3, and 4, respectively.

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 the species distribution, life history characteristics, and availability of habitat within the RNA.

² 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., *Pseudotsuga menziesii* is shortened to PSME). 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., Douglas-fir/Oregongrape-salal (*Pseudotsuga menziesii*/*Berberis nervosa*-*Gaultheria shallon*). Life form layers are separated by a slash (/). Co-dominants within a layer are separated by a hyphen (-).

Table 2—Plant association, understory coverage, and frequency of four forest plots in Fox Hollow Research Natural Area

	Plot 1		Plot 2		Plot 3		Plot 4	
	Frequency ^b	Cover	Frequency	PSME/TODI	Frequency	PSME/TODI	Frequency	PSME/HODI-SYMPH
Bare ground					7	1		
Coarse litter					4	+		
Fine litter	100	100	7	4	100	97	100	98
Moss	86	33	100	66	100	53	93	26
Lichen	82	5	75	3	79	5	89	6
<i>Corylus cornuta</i> var. <i>californica</i> ^c	—	11	—	37	—	35		
<i>Toxicodendron diversilobum</i>	—	16	—	14	—	7		
<i>Holodiscus discolor</i>			—	9				
<i>Symphoricarpos albus</i>	—	1	—	1			—	1
<i>Rosa gymnocarpa</i>	—	1	—	+				
<i>Berberis nervosa</i>	—	7					—	1
<i>Lonicera ciliosa</i>			—	+	—	+	—	3
<i>Adenocaulon bicolor</i>	11	1	4	+	4	+	64	8
<i>Osmorhiza berteroi</i>	11	1	14	1	11	1	43	1
<i>Polystichum munitum</i>	39	27	14	8	39	18		
<i>Trientalis borealis</i> ssp. <i>latifolia</i>	25	2	21	1	29	2	32	2
<i>Festuca occidentalis</i>	7	+	7	+	14	+	36	1
<i>Synthyris reniformis</i>	36	1	32	1	25	2	14	+
<i>Melica subulata</i>	21	+	25	+	61	1	54	1
<i>Galium triflorum</i>	18	+	18	+	21	+	4	+

Table 2—Plant association, understory coverage, and frequency of four forest plots in Fox Hollow Research Natural Area (continued)

	Plot 1		Plot 2		Plot 3		Plot 4	
	Frequency ^b	PSME/TODI ^a	Frequency	PSME/TODI	Frequency	PSME/TODI	Frequency	PSME/HODI-SYMPH
		Cover		Cover		Cover		Cover
<i>Galium trifidum</i> ssp. <i>columbianum</i>	14	+	11	+	21	1	21	1
<i>Sanicula crassicaulis</i>	7	+	21	1	21	2		
<i>Linnaea borealis</i>	11	+	11	3	11	1		
<i>Campanula scouleri</i>	29	1	18	1				
<i>Fragaria vesca</i> ssp. <i>bracteata</i>	21	1	25	1			4	+
<i>Festuca subulata</i>	11	+					14	1
<i>Moehringia macrophylla</i>	7	+			4	+		
<i>Bromus hordeaceus</i>			11	+	14	+	18	1
<i>Iris tenax</i>			7	+	7	+	4	+
<i>Collomia heterophylla</i>			14	1	4	+		
<i>Nemophila parviflora</i>			11	+	21	1		
<i>Ligusticum apiifolium</i>			7	+	4	1		
<i>Satureja douglasii</i>			4	+				
<i>Anisocarpus madrioides</i>			14	+	7	+	68	9
<i>Cardamine pulcherrimum</i>					14	+	14	+
<i>Pteridium aquilinum</i>							18	4
<i>Cynoglossum grande</i>							18	3
<i>Festuca californica</i>							14	2

^a PSME = *Pseudotsuga menziesii*, TODI = *Toxicodendron diversilobum*, HODI = *Holodiscus discolor*, SYMPH = *Symphoricarpos* spp., + = trace (<0.5 percent foliar cover), — = not recorded.^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.



Figure 4—Grand fir regeneration beneath a Douglas-fir canopy on an upper elevation bench.

Disturbance History

Prior to the 1970s, the tract was used for timber production and hunting. A 4.86 ha (12-ac) portion in the southwest corner of the RNA was clearcut and replanted in 1967. In recent years, public recreational use in the vicinity of the site has increased. No active fire-suppression activity has occurred on the site, but long-term region-wide fire suppression may have altered the timing, size, and severity of wildfires within the landscape surrounding the RNA. In the long term, the continued absence of fire in the landscape and successional trends within the tract suggest that the trajectory of the RNA will follow one or two patterns, depending on aspect. On north-facing slopes, grand fir may gradually codominate with Douglas-fir and incense cedar. On south-facing slopes and on ridgelines, Douglas-fir may replace old-growth ponderosa pine, Oregon white oak, and California black oak. Eventual canopy closure on the drier, warmer southerly aspects would contribute to an overall decline in herbaceous plant diversity (USDI BLM 1982a and 1982b).



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Figure 5—Mesic conditions support a dense shrub layer that includes California hazelnut and oceanspray with western swordfern as the dominant herbaceous ground cover.

Research History

The following research and monitoring projects have been undertaken within Fox Hollow RNA (Greene et al.1986, USDI BLM 1982a):

Carroll, G.C.; Carroll, F.E. 1978. Studies on the incidence of coniferous needle endophytes in the Pacific Northwest.

Christy, J.A.; Alverson, E.R.; Dougherty, M.P.; Kolar, S.C.; Alton, C.W.; Hawes, S.M.; Hickman, G.; Hiebler, J.A.; Nielsen, E.M. 2009. Classification of historical vegetation in Oregon, as recorded by General Land Office surveyors.

Cole, D. 1977. Ecosystem dynamics in the coniferous forests of the Willamette Valley, Oregon, U.S.A.

Maser, C. 1973. A preliminary list of mammals, birds, amphibians and reptiles of proposed Camas Swale, Fox Hollow, and Mohawk Research Natural Areas.



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Figure 6—South-facing upper slope with old-growth ponderosa pine and Douglas-fir overstory. Note the sparse shrub cover with moderate herbaceous cover and high diversity.

McCain, C.; Diaz, N. 2002. Field guide to the forested plant association of the Northern Oregon Coast Range.

Neitlich, P.; McCune, B. 1995. Lichen diversity in the upper Willamette and Siuslaw watersheds.

Schuller, R.; Greene, S.; Sawtelle, N.; Downing, G.; Curtis, A.; Widmer, M. 2000. Unpublished monitoring data.

Schuller, R.; Greene, S. 2010. Unpublished monitoring data.

Stone, D. 2009. Fox Hollow RNA lichen and bryophyte survey.

White, D. 1974. Floristic list of proposed Camas Swale, Fox Hollow, and Mohawk Research Natural Areas.

Maps

Maps applicable to Fox Hollow RNA: Topographic—Fox Hollow, Oregon, 7.5 minute, 1:24,000 scale, 1984; Eugene BLM District transportation map, 1:63360 [no date].

Acknowledgments

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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)

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Appendix 1—Plants^{1 2}

Scientific name	Common name
Coniferous trees:	
<i>Abies grandis</i> (Dougl.) Forbes	Grand fir
<i>Calocedrus decurrens</i> (Torr.) Florin	Incense cedar
<i>Pinus ponderosa</i> Laws. & C. Laws.	Ponderosa pine
<i>Pseudotsuga menziesii</i> (Mirbel) Franco.	Douglas-fir
<i>Taxus brevifolia</i> Nutt.	Western yew
Deciduous trees >8 m (26.3 ft) tall:	
<i>Acer macrophyllum</i> Pursh	Bigleaf maple
<i>Alnus rubra</i> Bong.	Red alder
<i>Arbutus menziesii</i> Pursh	Pacific madrone
<i>Chrysolepis chrysophylla</i> (Dougl. ex Hook.) Hjelmq.	Giant chinquapin
<i>Cornus nuttallii</i> Aud. ex T. & G.	Pacific dogwood
<i>Corylus cornuta</i> L. var. <i>californica</i> (DC.) Sharp	California hazelnut
<i>Crataegus douglasii</i> Lindl.	Black hawthorn
<i>Fraxinus latifolia</i> Benth.	Oregon ash
<i>Quercus garryana</i> Dougl.	Oregon white oak
<i>Quercus kelloggii</i> Newberry	California black oak
Tall shrubs 2 m to 8 m (6.6 to 26.3 ft) tall:	
<i>Acer circinatum</i> Pursh	Vine maple
<i>Amelanchier alnifolia</i> Nutt.	Saskatoon serviceberry
<i>Cornus sericea</i> L. ssp. <i>occidentalis</i> (T. & G) Fosberg	Western dogwood
<i>Holodiscus discolor</i> (Pursh) Maxim.	Oceanspray
<i>Oemleria cerasiformis</i> (T. & G. ex Hook. & Arn.) Landon	Indian plum
<i>Philadelphus lewisii</i> Pursh	Lewis' mock orange
<i>Physocarpus capitatus</i> (Pursh) Kuntze	Pacific ninebark
<i>Prunus avium</i> (L.) L.	Sweet cherry
<i>Rhamnus purshiana</i> DC.	Cascara
<i>Salix scouleriana</i> Barratt ex Hook.	Scouler's willow
Medium shrubs 0.5 m to 2 m (1.6 to 6.6 ft) tall:	
<i>Berberis aquifolium</i> Pursh	Holly leaved barberry
<i>Cytisus scoparius</i> (L.) Link.	Scotch broom
<i>Gaultheria shallon</i> Pursh	Salal
<i>Lonicera ciliosa</i> (Pursh) Poir. ex DC.	Orange honeysuckle
<i>Lonicera hispidula</i> (Lindl.) Dougl.	Pink honeysuckle
<i>Ribes sanguineum</i> Pursh	Redflower currant
<i>Rosa eglanteria</i> L.	Sweetbriar rose
<i>Rosa gymnocarpa</i> Nutt.	Baldhip rose
<i>Rubus laciniatus</i> Willd.	Evergreen huckleberry
<i>Rubus leucodermis</i> Dougl. ex T. & G.	Whitebark raspberry
<i>Symphoricarpos albus</i> (L.) Blake	Common snowberry
<i>Toxicodendron diversilobum</i> (T. & G) Greene	Pacific poison oak
<i>Vaccinium parvifolium</i> Sm.	Red huckleberry
<i>Viburnum ellipticum</i> Hook.	Common viburnum
Low shrubs < 0.5 m (1.6 ft) tall:	
<i>Berberis nervosa</i> Pursh	Oregongrape
<i>Rubus ursinus</i> Cham. & Schlecht.	California dewberry
<i>Whipplea modesta</i> Torr.	Common whipplea

Scientific name	Common name
Ferns and allies:	
<i>Adiantum pedatum</i> L.	Northern maidenhair
<i>Athyrium filix-femina</i> (L.) Roth.	Common lady fern
<i>Cystopteris fragilis</i> (L.) Bernh.	Brittle bladderfern
<i>Dryopteris arguta</i> (Kaulf.) Watt.	Coastal woodfern
<i>Polypodium glycyrrhiza</i> DC. Eat.	Licorice fern
<i>Polystichum munitum</i> (Kaulf.) C. Presl	Western swordfern
<i>Pteridium aquilinum</i> (L.) Kuhn.	Western brackenfern
Herbs:	
<i>Achillea millefolium</i> L.	Common yarrow
<i>Achlys triphylla</i> (Sm.) DC.	Sweet after death
<i>Actaea rubra</i> (Aiton) Willd.	Red baneberry
<i>Adenocaulon bicolor</i> Hook.	American trailplant
<i>Anemone deltoidea</i> Hook.	Columbian windflower
<i>Anemone lyallii</i> Britt.	Lyall's anemone
<i>Angelica arguta</i> Nutt.	Lyall's angelica
<i>Aquilegia formosa</i> Fisch.	Western columbine
<i>Asarum caudatum</i> Lindl.	Wild ginger
<i>Balsamorhiza deltoidea</i> Nutt.	Deltoid balsamroot
<i>Bellis perennis</i> L.	Lawn daisy
<i>Brodiaea elegans</i> Hoover	Harvest brodiaea
<i>Calochortus tolmiei</i> Hook. & Arn.	Tolmie star-tulip
<i>Calypso bulbosa</i> (L.) Oakes	Fairy slipper
<i>Campanula prenanthoides</i> Dur.	California harebell
<i>Campanula scouleri</i> Hook. ex DC.	Pale bellflower
<i>Cardamine nuttallii</i> Greene var. <i>nuttallii</i>	Palmate toothwort
<i>Cardamine oligosperma</i> Nutt.	Little western bittercress
<i>Centaureium umbellatum</i> Gilig.	European centaury
<i>Cerastium arvense</i> L.	Field chickweed
<i>Cerastium viscosum</i> L.	Sticky chickweed
<i>Chamerion angustifolium</i> (L.) Holub	Fireweed
ssp. <i>circumvagum</i> (Mosq.) Hoch	
<i>Chimaphila umbellata</i> (L.) W. Bartram	Pipsissewa
<i>Circaea alpina</i> L.	Alpine circaea
<i>Cirsium arvense</i> (L.) Scop. var. <i>horridum</i> Wimm. & Grab.	Canada thistle
<i>Cirsium vulgare</i> (Savi) Ten.	Bull thistle
<i>Claytonia perfoliata</i> Donn ex Willd.	Miner's lettuce
<i>Claytonia sibirica</i> L.	Siberian springbeauty
<i>Collinsia parviflora</i> Lindl.	Maiden blue eyed Mary
<i>Collomia heterophylla</i> Hook.	Variableleaf collomia
<i>Coptis laciniata</i> Gray	Cutleaf goldthread
<i>Corallorhiza maculata</i> Raf.	Summer coralroot
<i>Cryptantha intermedia</i> (Gray) Greene	Clearwater cryptantha
<i>Cynoglossum grande</i> Dougl.	Pacific hound's tongue
<i>Daucus carota</i> L.	Queen Anne's lace
<i>Delphinium menziesii</i> DC.	Menzies' larkspur
<i>Dicentra formosa</i> (Andr.) Walp.	Pacific bleeding heart
<i>Epilobium brachycarpum</i> C. Presl	Tall annual willowherb
<i>Epilobium minutum</i> Lindl. ex Lehm.	Chaparral willowherb
<i>Equisetum arvense</i> L.	Field horsetail

Scientific name	Common name
<i>Equisetum hyemale</i> L.	Scouringrush horsetail
<i>Equisetum telmateia</i> Ehrh.	Giant horsetail
<i>Eriophyllum lanatum</i> (Pursh) Forbes	Common woolly sunflower
<i>Erythronium oregonum</i> Applegate	Giant white fawnlily
<i>Eurybia radulina</i> (A. Gray) G.L. Nesom	Roughleaf aster
<i>Fragaria vesca</i> L. ssp. <i>bracteata</i> (A. Heller) Staudt	Woodland strawberry
<i>Galium aparine</i> L.	Stickywilly
<i>Galium trifidum</i> L. ssp. <i>columbianum</i> (Rydb.) Hultén	Threepetal bedstraw
<i>Galium triflorum</i> Michx.	Sweet scented bedstraw
<i>Geranium molle</i> L.	Dovefoot geranium
<i>Goodyera oblongifolia</i> Raf.	Western rattlesnake plantain
<i>Hieracium albiflorum</i> Hook.	White hawkweed
<i>Hydrophyllum</i> sp.	Waterleaf
<i>Hypericum perforatum</i> L.	St. John's wort
<i>Hypochaeris radicata</i> L.	Hairy cat's-ear
<i>Iris chrysophylla</i> Howell	Yellowleaf iris
<i>Iris tenax</i> Dougl. ex Lindl.	Toughleaf iris
<i>Lathyrus nevadensis</i> Wats.	Sierra pea
<i>Lathyrus polyphyllus</i> Nutt.	Leafy pea
<i>Leucanthemum vulgare</i> Lam.	Oxeye daisy
<i>Ligusticum apiifolium</i> (Nutt. ex T. & G.) Gray	Celeryleaf licoriceroot
<i>Lilium columbianum</i> Leichtlin	Columbia lily
<i>Linnaea borealis</i> L.	Twinflower
<i>Listera cordata</i> (L.) R. Br.	Heartleaf twayblade
<i>Lomatium utriculatum</i> (Nutt.) Coult. & Rose	Common lomatium
<i>Lotus micranthus</i> Benth.	Desert deervetch
<i>Madia gracilis</i> (Sm.) D.D. Keck	Grassy tarweed
<i>Maianthemum racemosum</i> (L.) Link.	Feathery false lily of the valley
<i>Maianthemum stellatum</i> (L.) Desf.	Starry false-Solomonseal
<i>Marah oreganus</i> (T. & G.) Howell	Wild cucumber
<i>Mimulus alsinoides</i> Dougl. ex Benth.	Wingstem monkeyflower
<i>Mimulus guttatus</i> DC.	Seep monkeyflower
<i>Mitella caulescens</i> Nutt.	Slightstemmed miterwort
<i>Moehringia macrophylla</i> (Hook.) Fenzl	Largeleaf sandwort
<i>Nemophila menziesii</i> Hook. & Arn.	Baby blue eyes
<i>Nemophila parviflora</i> Dougl. ex Benth.	Small-flowered nemophila
<i>Oenanthe sarmentosa</i> Presl	Water parsely
<i>Osmorhiza berteroi</i> DC.	Sweetcicely
<i>Oxalis suksdorfii</i> Trel.	Suksdorf woodsorrell
<i>Phacelia nemoralis</i> Greene	Shade phacelia
<i>Piperia elegans</i> (Lindl.) Rydb. ssp. <i>elegans</i>	Elegant piperia
<i>Plectritis congesta</i> (Lindl.) DC.	Shortspur seablush
<i>Potentilla</i> sp.	Cinquefoil
<i>Prosartes smithii</i> (Hook.) Utech, Shinwari & Kawano	Large-flower fairybells
<i>Prunella vulgaris</i> L.	Self heal
<i>Psoralea physodes</i> (Douglas ex Hook.) J. Grimes	Forest scurfpea
<i>Ranunculus uncinatus</i> D. Don	Woodland buttercup
<i>Sanicula bipinnatifida</i> Dougl. ex Hook.	Purple sanicle
<i>Sanicula crassicaulis</i> Poepp. ex DC.	Pacific blacksnakeroot
<i>Satureja douglasii</i> (Benth.) Briq.	Yerba buena

Scientific name	Common name
<i>Senecio jacobaea</i> L.	Tansy ragwort
<i>Sherardia arvensis</i> L.	Blue fieldmadder
<i>Stachys chamissonis</i> Benth. var. <i>cooleyae</i> (A. Heller) G. Mulligan & D. Munro	Coastal hedgenettle
<i>Stellaria</i> sp.	Starwort
<i>Synthyris reniformis</i> (Dougl. ex Benth.) Benth.	Snowqueen
<i>Tellima grandiflora</i> (Pursh) Dougl. ex Lindl.	Bigflower tellima
<i>Thermopsis montana</i> Nutt.	Mountain goldenbanner
<i>Tiarella trifoliata</i> L.	Threelaf foamflower
<i>Trientalis borealis</i> Raf. ssp. <i>latifolia</i> (Hook.) Hultén	Broadleaf starflower
<i>Trifolium bifidum</i> Gray	Notchleaf clover
<i>Trifolium microdon</i> Hook. & Arn.	Thimble clover
<i>Trillium ovatum</i> Pursh	Pacific trillium
<i>Vancouveria hexandra</i> (Hook.) Morr. & Dec.	Inside-out flower
<i>Veronica arvensis</i> L.	Corn speedwell
<i>Vicia americana</i> Muhl. ex Willd.	American vetch
<i>Viola sempervirens</i> Greene	Evergreen violet
<i>Wyethia angustifolia</i> (DC.) Nutt.	California compassplant
Grasses, sedges, and rushes:	
<i>Aira caryophyllaea</i> L.	Silver hairgrass
<i>Carex obnupta</i> L.H. Bailey	Slough sedge
<i>Carex</i> sp.	Sedge
<i>Cynosurus echinatus</i> L.	Bristly dogstail grass
<i>Elymus glaucus</i> Buckl.	Blue wildrye
<i>Festuca californica</i> Vasey	California fescue
<i>Festuca occidentalis</i> Hook.	Western fescue
<i>Festuca subulata</i> Trin.	Bearded fescue
<i>Holcus lanatus</i> L.	Common velvetgrass
<i>Juncus</i> sp.	Rush
<i>Luzula multiflora</i> (Ehrh.) Lej. ssp. <i>multiflora</i>	Common woodrush
<i>Melica subulata</i> (Griseb.) Scribn.	Alaska oniongrass
<i>Poa trivialis</i> L.	Rough bluegrass
<i>Scirpus microcarpus</i> J. Presl & C. Presl.	Panicled bulrush
<i>Trisetum cernuum</i> Trin.	Nodding trisetum

¹ Nomenclature for vascular plants, ferns, and fern-allies follows the Flora of North America (1993+) and the Oregon Flora Project Web site (2011).

² Compiled from field observations (White 1974), Curtis (1986), and Schuller and Greene (2010).

Appendix 2—Lichens^{1 2}

Species name	Authorities
Macrolichens:	
<i>Alectoria sarmentosa</i>	(Ach.) Ach.
<i>Alectoria vancouverensis</i>	(Gyelnik) Gyelnik ex Brodo & D. Hawksw.
<i>Bryoria capillaris</i>	(Ach.) Brodo & D. Hawksw.
<i>Bryoria fremontii</i>	(Tuck.) Brodo & D. Hawksw.
<i>Bryoria friabilis</i>	Brodo & D. Hawksw.
<i>Chaenotheca brunneola</i>	(Ach.) Müll.
<i>Chaenotheca furfuracea</i>	(L.) Tibell
<i>Chrysothrix</i> sp.	Mont.
<i>Cladonia cariosa</i>	(Ach.) Sprengel
<i>Cladonia chlorophaea</i> group	(Flörke ex Sommerf.) Sprengel
<i>Cladonia fimbriata</i>	(L.) Fr.
<i>Cladonia furcata</i>	(Hudson) Schrader
<i>Cladonia ochrochlora</i>	Flörke
<i>Cladonia pyxidata</i>	(L.) Hoffm.
<i>Cladonia subsquamosa</i>	Kremp.
<i>Cladonia transcendens</i>	(Vainio) Vainio
<i>Cladonia verruculosa</i>	(Vainio) Ahti
<i>Evernia prunastri</i>	(L.) Ach.
<i>Fuscopannaria pacifica</i>	P. M. Jørg.
<i>Hypogymnia enteromorpha</i>	(Ach.) Nyl.
<i>Hypogymnia imshaugii</i>	Krog
<i>Hypogymnia inactiva</i>	(Krog) Ohlsson
<i>Hypogymnia physodes</i>	(L.) Nyl.
<i>Hypogymnia tubulosa</i>	(Schaerer) Hav.
<i>Icmadophila ericetorum</i>	(L.) Zahlbr.
<i>Leptogium gelatinosum</i>	(With.) J. R. Laundon
<i>Leptogium polycarpum</i>	P. M. Jørg. & Goward
<i>Leptogium tenuissimum</i> group	(Dickson) Körber
<i>Letharia vulpina</i>	(L.) Hue
<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>Nephroma helveticum</i>	Ach.
<i>Nephroma laevigatum</i>	Ach.
<i>Nephroma resupinatum</i>	(L.) Ach.
<i>Parmelia sulcata</i>	Taylor
<i>Peltigera britannica</i>	(Gyelnik) Holt.
<i>Peltigera collina</i>	(Ach.) Schrader
<i>Peltigera leucophlebia</i>	(Nyl.) Gyelnik
<i>Peltigera membranacea</i>	(Ach.) Nyl.
<i>Peltigera neopolydactyla</i>	(Gyelnik) Gyelnik
<i>Peltigera praetextata</i>	(Flörke ex Sommerf.) Zopf
<i>Physcia adscendens</i>	(Fr.) H. Olivier
<i>Platismatia glauca</i>	(L.) W. L. Culb. & C. F. Culb.
<i>Platismatia herrei</i>	(Imshaug) W. L. Culb. & C. F. Culb.
<i>Pseudocyphellaria anomala</i>	Brodo & Ahti

Species name	Authorities
<i>Pseudocyphellaria anthraspis</i>	(Ach.) H. Magn.
<i>Pseudocyphellaria crocata</i>	(L.) Vainio
<i>Ramalina dilacerata</i>	(Hoffm.) Hoffm.
<i>Ramalina farinacea</i>	(L.) Ach.
<i>Ramalina thrausta</i>	(Ach.) Nyl.
<i>Sphaerophorus globosus</i>	(Hudson) Vainio
<i>Sphaerophorus tuckermanii</i>	Räsänen
<i>Sphaerophorus venerabilis</i>	Wedin, Högnabba & Goward
<i>Tuckermannopsis chlorophylla</i>	(Willd.) Hale
<i>Tuckermannopsis orbata</i>	(Nyl.) M. J. Lai
<i>Usnea</i> sp.	Dill. ex Adans.
<i>Usnea filipendula</i> group	Stirton
<i>Usnea flavocardia</i>	Räsänen
<i>Usnea glabrata</i>	(Ach.) Vainio
<i>Usnea longissima</i>	Ach.
<i>Usnea scabrata</i>	(Ach.) Vainio
Crustose lichen:	
<i>Ochrolechia oregonensis</i>	H. Magn.

¹ Nomenclature for macrolichen and microlichen species follows Esslinger (2010).

² Compiled from field surveys by Neitlich and McCune (1995) and Stone (2009).

Appendix 3—Bryophytes^{1 2}

Scientific name and authorities	Common name
<i>Amphidium californicum</i> (Hampe ex Müll. Hal.) Broth.	California amphidium moss
<i>Antitrichia curtipendula</i> (Hedw.) Brid.	Antitrichia moss
<i>Atrichum selwynii</i> Austin	Selwyn's atrichum moss
<i>Blepharostoma trichophyllum</i> (L.) Dumort.	—
<i>Bryum</i> sp.	Bryum moss
<i>Buxbaumia</i> sp.	Buxbaumia moss
<i>Cephalozia lunulifolia</i> (Dumort.) Dumort	—
<i>Chiloscyphus coadunatus</i> (Sw.) R.M. Schust. & J.J. Engel	—
<i>Chiloscyphus pallescens</i> (Ehrh. ex Hoffm.) Dumort.	—
<i>Chiloscyphus profundus</i> (Nees) J.J. Engel & R.M. Schust.	—
<i>Claopodium bolanderi</i> Best	Bolander's claopodium moss
<i>Claopodium whippleanum</i> (Sull.) Renauld & Cardot	Whipple's claopodium moss
<i>Conocephalum conicum</i> (L.) Dumort.	—
<i>Dendroalsia abietina</i> (Hook.) E. Britton	Dendroalsia moss
<i>Dicranoweisia cirrata</i> (Hedw.) Lindb. ex Milde	Dicranoweisia moss
<i>Dicranum howellii</i> Renauld & Cardot	Howell's dicranum moss
<i>Dicranum tauricum</i> Sapeh.	Dicranum
<i>Didymodon</i> sp.	Didymodon moss
<i>Didymodon fallax</i> (Hedw.) R.H. Zander	Didymodon moss
<i>Ditrichum</i> sp.	Ditrichum moss
<i>Epipterygium tozeri</i> (Grev.) Lindb.	Tozer's epipterygium moss
<i>Eurhynchium oreganum</i> (Sull.) A. Jaeger	Oregon eurhynchium moss
<i>Eurhynchium praelongum</i> (Hedw.) Schimp.	Eurhynchium moss
<i>Fissidens bryoides</i> Hedw.	Bryoid fissidens moss
<i>Fissidens ventricosus</i> Lesq.	Fissidens moss
<i>Frullania bolanderi</i> Austin	—
<i>Frullania californica</i> (Austin) A. Evans	—
<i>Frullania nisquallensis</i> Sull.	—
<i>Homalothecium fulgescens</i> (Mitt. ex Müll. Hal.) E. Lawton	Tree mat homalothecium moss
<i>Homalothecium nuttallii</i> (Wilson) A. Jaeger	Nuttall's homalothecium moss
<i>Hylocomium splendens</i> (Hedw.) Schimp.	Splendid feather moss
<i>Hypnum circinale</i> Hook.	Hypnum moss
<i>Isothecium cristatum</i> (Hampe) H. Rob.	Isothecium moss
<i>Isothecium myosuroides</i> Brid.	Isothecium moss
<i>Jungermannia</i> sp.	Jungermannia moss
<i>Lepidozia reptans</i> (L.) Dumort.	—
<i>Leucolepis acanthoneuron</i> (Schwägr.) Lindb.	Leucolepis umbrella moss
<i>Lophocolea</i> sp.	—
<i>Lophozia</i> sp.	—
<i>Lophozia incisa</i> (Schrad.) Dumort.	—
<i>Metaneckera menziesii</i> (Hook.) Steere	Menzies' metaneckera moss
<i>Neckera douglasii</i> Hook.	Douglas' neckera moss
<i>Orthotrichum consimile</i> Mitt.	Orthotrichum moss
<i>Orthotrichum lyellii</i> Hook. & Taylor	Lyell's orthotrichum moss
<i>Plagiochila porelloides</i> (Torr. ex Nees) Lindenb.	—
<i>Plagiomnium insigne</i> (Mitt.) T. Kop.	Plagiomnium moss
<i>Plagiomnium venustum</i> (Mitt.) T. Kop.	Plagiomnium moss
<i>Plagiothecium denticulatum</i> (Hedw.) Schimp.	Toothed plagiothecium moss
<i>Plagiothecium undulatum</i> (Hedw.) Schimp.	Undulate plagiothecium moss

Scientific name and authorities	Common name
<i>Polytrichum juniperinum</i> Hedw.	Juniper polytrichum moss
<i>Porella cordaeana</i> (Huebener) Moore	—
<i>Porella navicularis</i> (Lehm. & Lindenb.) Lindb.	—
<i>Porotrichum bigelovii</i> (Sull.) Kindb.	Bigelow's porotrichum moss
<i>Porotrichum vancouveriense</i> (Kindb.) H.A. Crum	Vancouver porotrichum moss
<i>Pseudotaxiphyllum elegans</i> (Brid.) Z. Iwats.	Elegant pseudotaxiphyllum moss
<i>Racomitrium elongatum</i> Ehrh. ex Frisvoll	Elongate racomitrium moss
<i>Radula complanata</i> (L.) Dumort.	—
<i>Rhizomnium glabrescens</i> (Kindb.) T. Kop.	Rhizomnium moss
<i>Rhytidiadelphus triquetrus</i> (Hedw.) Warnst.	Rough goose neck moss
<i>Riccardia latifrons</i> (Lindb.) Lindb.	—
<i>Riccardia multifida</i> (L.) A. Gray	—
<i>Riccia</i> sp.	—
<i>Scapania bolanderi</i> Austin	—
<i>Scapania undulata</i> (L.) Dumort.	—
<i>Scleropodium obtusifolium</i> (A. Jaeger) Kindb.	Obtuseleaf scleropodium moss
<i>Syntrichia laevipila</i> Brid.	—
<i>Tetraphis pellucida</i> Hedw.	Tetraphis moss
<i>Timmiella crassinervis</i> (Hampe) L.F. Koch	Timmiella moss
<i>Trachybryum megaptilum</i> (Sull.) Schof.	Trachybryum moss
<i>Weissia controversa</i> Hedw.	Controversial weissia moss

— = No common name available.

¹ Nomenclature and common names follow USDI NRCS (2011a).

² Compiled from field surveys by Stone (2009) and USDI BLM (2011).

Appendix 4—Fungi^{1 2}

Scientific name	Common name
<i>Crucibulum crucibuliforme</i> (Scop.) V.S. White	—
<i>Fomitopsis pinicola</i> (Sw.) P. Karst.	Red-belt conk
<i>Galerina marginata</i> (Batsch) Kühner	Deadly galerina
<i>Helvella compressa</i> (Snyder) N.S. Weber	Compressed elfin saddle
<i>Helvella fibrosa</i> (Wallr.) Korf	Fibrous elfin saddle
<i>Helvella maculata</i> N.S. Weber	Fluted brown elfin saddle
<i>Hericium erinaceus</i> (Bull.) Pers	Lion's mane
<i>Hygrocybe punicea</i> (Fr.) P. Kumm.	Scarlet waxy cap
<i>Inocybe lilacina</i> (Peck) Kauffman	Lilac inocybe
<i>Inocybe sororia</i> Kauffman	Corn silk inocybe
<i>Lepiota clypeolaria</i> (Bull.) P. Kumm.	Shaggy-stalked parasol
<i>Lycoperdon marginatum</i> Vittad.	Peeling puffball
<i>Marasmius plicatulus</i> Peck	Pleated marasmius
<i>Naematoloma fasciculare</i> (Huds.) P. Karst.	Sulfur tuft
<i>Phaeolus schweinitzii</i> (Fries) Pat.	Deer mushroom
<i>Pseudohydnum gelatinosum</i> (Scop.) P. Karst.	Toothed jelly fungus
<i>Russula cyanoxantha</i> (Schaeff.) Fr.	Variegated russula
<i>Stropharia ambigua</i> (Peck) Zeller	Questionable stropharia
<i>Trametes versicolor</i> (L.) Lloyd	Turkey tail
<i>Tremella mesenterica</i> (Schaeff.) Retz	Witch's butter

— = No common name available.

¹ Nomenclature follows Mycobank (2011).

² Compiled from field surveys by USDI BLM (2011).

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

Family	Scientific name	Common name
Amphibians:		
Ambystomatidae	<i>Ambystoma gracile</i>	Northwestern salamander
	<i>Ambystoma macrodactylum</i>	Long-toed salamander
Dicamptodontidae	<i>Dicamptodon tenebrosus</i>	Pacific giant salamander
Plethodontidae	<i>Aneides ferreus</i>	Clouded salamander
	<i>Ensatina eschscholtzi</i>	Ensatina
	<i>Plethodon dunni</i>	Dunn's salamander
	<i>Plethodon vehiculum</i>	Western redback
Salamandridae	<i>Taricha granulosa</i>	Roughskin newt
Bufo	<i>Bufo boreas</i>	Western toad
Hylidae	<i>Pseudacris regilla</i>	Pacific treefrog
Ranidae	<i>Rana aurora</i>	Red-legged frog
Reptiles:		
Anguillidae	<i>Elgaria coerulea</i>	Northern alligator lizard
	<i>Elgaria multicarinata</i>	Southern alligator lizard
Scincidae	<i>Eumeces skiltonianus</i>	Western skink
Boidae	<i>Charina bottae</i>	Rubber boa
Colubridae	<i>Contia tenuis</i>	Sharptail snake
	<i>Diadophis punctatus</i>	Ringneck snake
	<i>Thamnophis elegans</i>	Western terrestrial garter snake
	<i>Thamnophis ordinoides</i>	Northwestern garter snake
	<i>Thamnophis sirtalis</i>	Common garter snake
Iguanidae	<i>Sceloporus occidentalis</i>	Western fence lizard
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
Falconidae	<i>Falco columbarius</i>	Merlin
Phasianidae	<i>Bonasa umbellus</i>	Ruffed grouse
	<i>Callipepla californica</i>	California quail
	<i>Dendragapus obscurus</i>	Blue grouse
	<i>Oreortyx pictus</i>	Mountain quail
Columbidae	<i>Columba fasciata</i>	Band-tailed pigeon
	<i>Zenaidura macroura</i>	Mourning dove
Strigidae	<i>Aegolius acadicus</i>	Northern saw-whet owl
	<i>Asio otus</i>	Long-eared owl
	<i>Bubo virginianus</i>	Great horned owl
	<i>Glaucidium gnoma</i>	Northern pygmy-owl
	<i>Otus kennicottii</i>	Western screech-owl
	<i>Strix occidentalis caurina</i>	Northern spotted owl
Caprimulgidae	<i>Strix varia</i>	Barred owl
	<i>Chordeiles minor</i>	Common nighthawk

Family	Scientific name	Common name
Apodidae	<i>Chaetura vauxi</i>	Vaux's swift
Trochilidae	<i>Calypte anna</i>	Anna's hummingbird
	<i>Selasphorus rufus</i>	Rufous hummingbird
Picidae	<i>Colaptes auratus</i>	Northern flicker
	<i>Dryocopus pileatus</i>	Pileated woodpecker
	<i>Picoides pubescens</i>	Downy 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 peewee
	<i>Empidonax hammondi</i>	Hammond's flycatcher
	<i>Empidonax traillii</i>	Willow flycatcher
	<i>Tyrannus verticalis</i>	Western kingbird
Hirundinidae	<i>Progne subis</i>	Purple martin
	<i>Tachycineta bicolor</i>	Tree swallow
	<i>Tachycineta thalassina</i>	Violet-green swallow
Corvidae	<i>Perisoreus Canadensis</i>	Gray jay
	<i>Cyanocitta stelleri</i>	Steller's jay
	<i>Corvus brachyrhynchos</i>	American crow
	<i>Corvus corax</i>	Common raven
Paridae	<i>Parus atricapillus</i>	Black-capped chickadee
	<i>Parus rufescens</i>	Chestnut-backed chickadee
Aegithalidae	<i>Psaltiriparus minimus</i>	Bushtit
Sittidae	<i>Sitta canadensis</i>	Red-breasted nuthatch
	<i>Sitta carolinensis</i>	White-breasted nuthatch
Certhiidae	<i>Certhia americana</i>	Brown creeper
Troglodytidae	<i>Thryomanes bewickii</i>	Bewick's wren
	<i>Troglodytes troglodytes</i>	Winter wren
Muscicapidae	<i>Catharus guttatus</i>	Hermit thrush
	<i>Catharus ustulatus</i>	Swainson's thrush
	<i>Chamaea fasciata</i>	Wrentit
	<i>Ixoreus naevius</i>	Varied thrush
	<i>Regulus satrapa</i>	Golden-crowned kinglet
	<i>Sialia mexicana</i>	Western bluebird
	<i>Turdus migratorius</i>	American robin
Bombycillidae	<i>Bombycilla cedrorum</i>	Cedar waxwing
Vireonidae	<i>Vireo cassinii</i>	Cassin's vireo
	<i>Vireo gilvus</i>	Warbling vireo
	<i>Vireo huttonii</i>	Hutton's vireo
Emberizidae	<i>Dendroica coronate</i>	Yellow-rumped warbler
	<i>Dendroica nigrescens</i>	Black-throated gray warbler
	<i>Dendroica occidentalis</i>	Hermit warbler
	<i>Dendroica petechial</i>	Yellow warbler
	<i>Junco hyemalis</i>	Dark-eyed junco
	<i>Melospiza melodia</i>	Song sparrow
	<i>Molothrus ater</i>	Brown-headed cowbird
	<i>Oporornis tolmiei</i>	MacGillivray's warbler

Family	Scientific name	Common name
Fringillidae	<i>Passerella iliaca</i>	Fox sparrow
	<i>Pheucticus melanocephalus</i>	Black-headed grosbeak
	<i>Pipilo maculatus</i>	Spotted towhee
	<i>Piranga rubra</i>	Western tanager
	<i>Spizella passerine</i>	Chipping sparrow
	<i>Wilsonia pusilla</i>	Wilson's warbler
	<i>Zonotrichia atricapilla</i>	Golden-crowned sparrow
	<i>Zonotrichia leucophrys</i>	White-crowned sparrow
	<i>Carduelis pinus</i>	Pine siskin
	<i>Carduelis psaltria</i>	Lesser goldfinch
	<i>Carduelis tristis</i>	American goldfinch
	<i>Coccothraustes vespertinus</i>	Evening grosbeak
	<i>Loxia curvirostra</i>	Red crossbill
Mammals:		
Didelphidae	<i>Didelphis virginiana</i>	Virginia opossum
Soricidae	<i>Sorex bendirii</i>	Marsh shrew
	<i>Sorex pacificus</i>	Pacific shrew
	<i>Sorex sonomae</i>	Fog shrew
	<i>Sorex trowbridgii</i>	Trowbridge's shrew
Talpidae	<i>Neotrichus gibbsii</i>	Shrew-mole
	<i>Scapanus orarius</i>	Coast mole
Vespertilionidae	<i>Eptesicus fuscus</i>	Big brown bat
	<i>Lasionycteris noctivagans</i>	Silver-haired bat
	<i>Lasiurus cinereus</i>	Hoary bat
	<i>Myotis californicus</i>	California myotis
	<i>Myotis evotis</i>	Long-eared myotis
	<i>Myotis lucifugus</i>	Little brown bat
	<i>Myotis thysanodes</i>	Fringed myotis
	<i>Myotis volans</i>	Long-legged myotis
Leporidae	<i>Sylvilagus bachmani</i>	Brush rabbit
Sciuridae	<i>Glaucomys sabrinus</i>	Northern flying squirrel
	<i>Sciurus griseus</i>	Western gray squirrel
	<i>Tamias townsendii</i>	Townsend's chipmunk
	<i>Tamiasciurus douglasii</i>	Douglas' squirrel
Muridae	<i>Clethrionomys californicus</i>	Western red-backed vole
	<i>Microtus logicaudus</i>	Long-tailed vole
	<i>Microtus oregoni</i>	Creeping vole
	<i>Microtus townsendii</i>	Townsend's vole
	<i>Neotoma fuscipes</i>	Dusky-footed woodrat
	<i>Peromyscus maniculatus</i>	Deer mouse
	<i>Phenacomys albipes</i>	White-footed vole
	<i>Phenacomys longicaudus</i>	Red tree vole
Dipodidae	<i>Zapus trinotatus</i>	Pacific jumping mouse
Erethizontidae	<i>Erethizon dorsatum</i>	Common porcupine
Castoridae	<i>Castor canadensis</i>	American beaver

Family	Scientific name	Common name
Canidae	<i>Canis latrans</i>	Coyote
	<i>Urocyon cinereoagrenteus</i>	Common gray fox
	<i>Vulpes vulpes</i>	Red fox
Ursidae	<i>Ursus americanus</i>	Black bear
Procyonidae	<i>Procyon lotor</i>	Common raccoon
Mustelidae	<i>Mephitis mephitis</i>	Striped skunk
	<i>Mustela ermine</i>	Short-tailed weasel
	<i>Mustela frenata</i>	Long-tailed weasel
	<i>Spilogale gracilis</i>	Western spotted skunk
Felidae	<i>Felis concolor</i>	Mountain lion
	<i>Lynx rufus</i>	Bobcat
Cervidae	<i>Cervus elaphus</i>	Elk
	<i>Odocoileus hemionus columbianus</i>	Black-tailed deer

¹ Compiled from field observations (Curtis 1986, Maser 1973), and from habitat descriptions and distribution maps in Csuti et al. 1997.

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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