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Fox Hollow Research Natural Area: Guidebook Supplement 44

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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 supplement[1] 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 system[2] 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 elements[4] 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.

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[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.

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[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.

Contents

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.

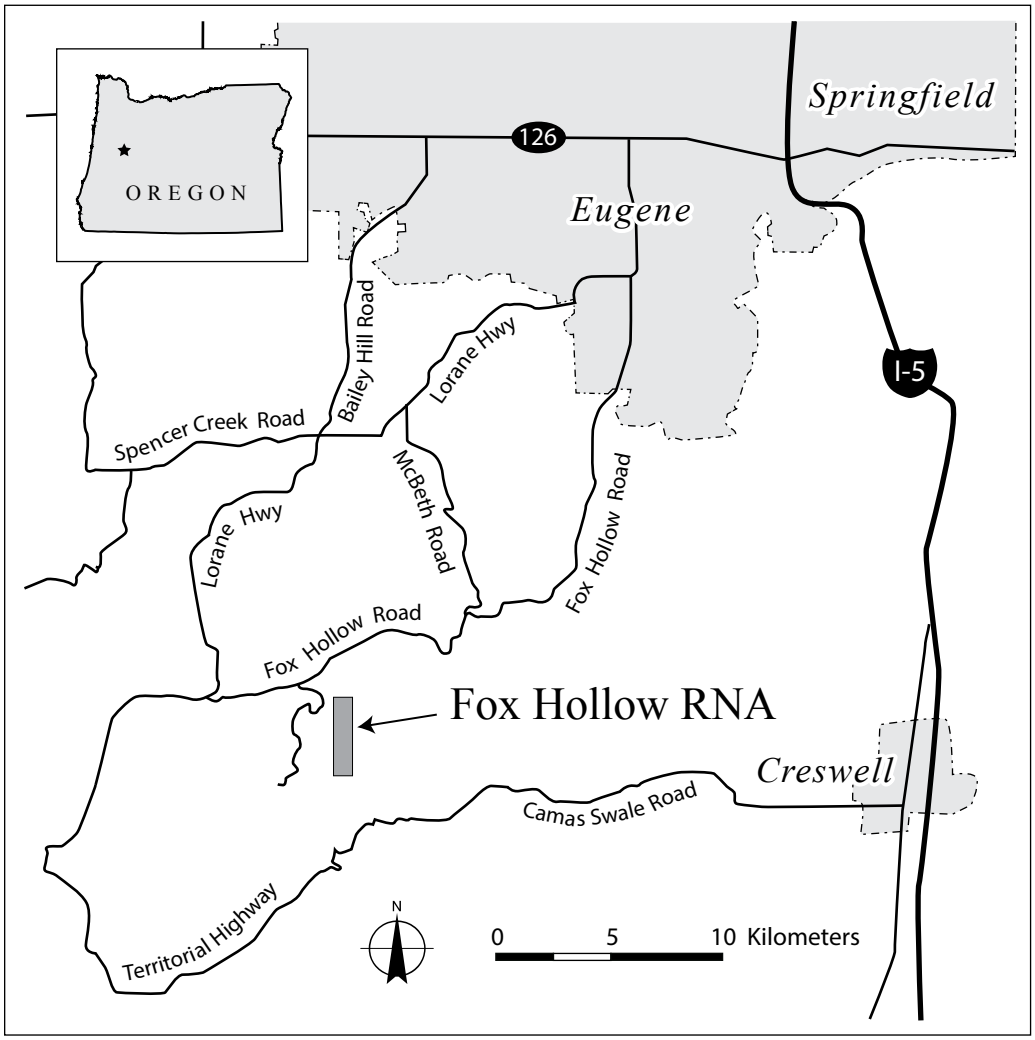

Figure 1—Fox Hollow Research Natural Area (RNA) location and access.

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

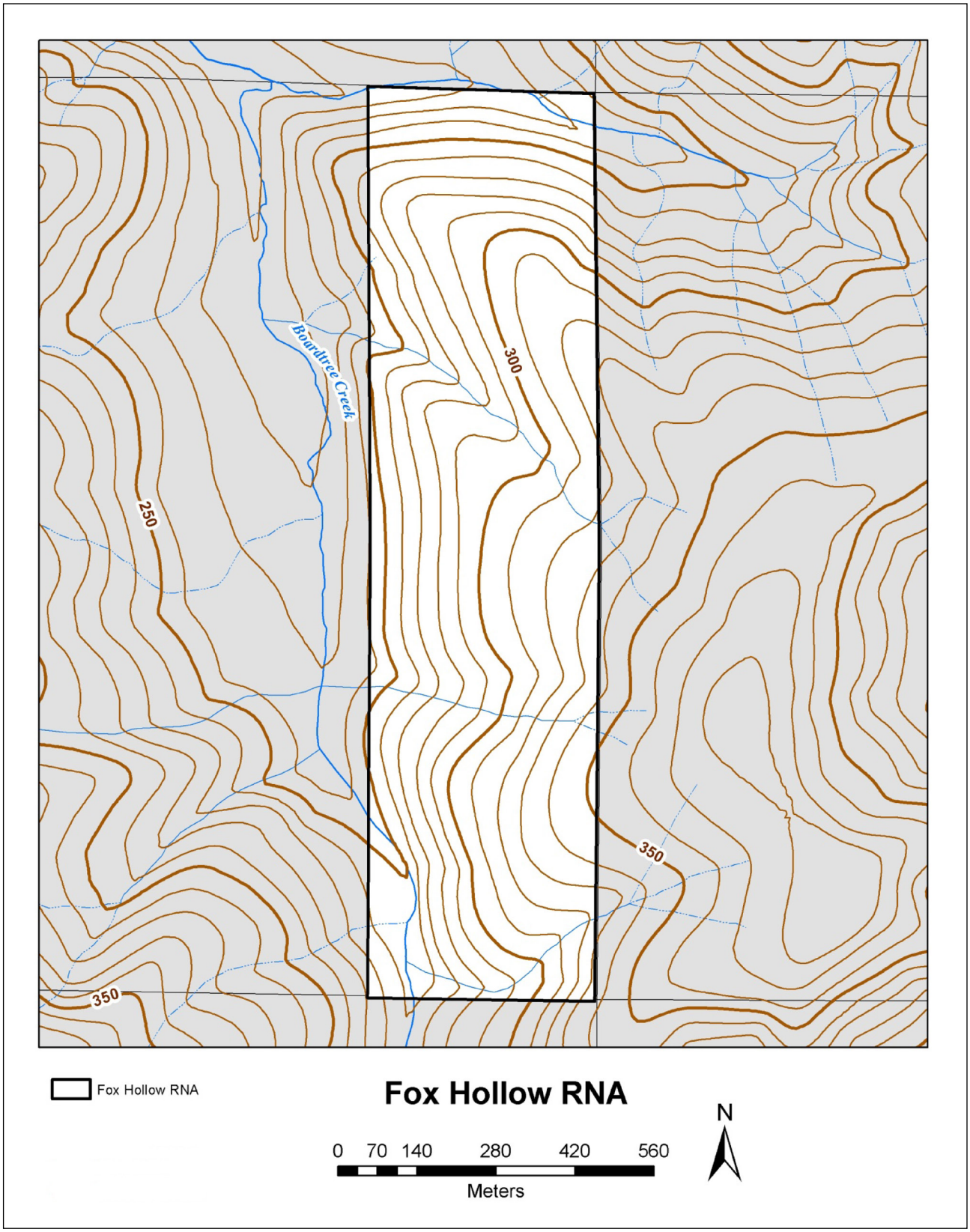

Figure 2—Fox Hollow Research Natural Area (RNA) topography and boundary.

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.

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

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.

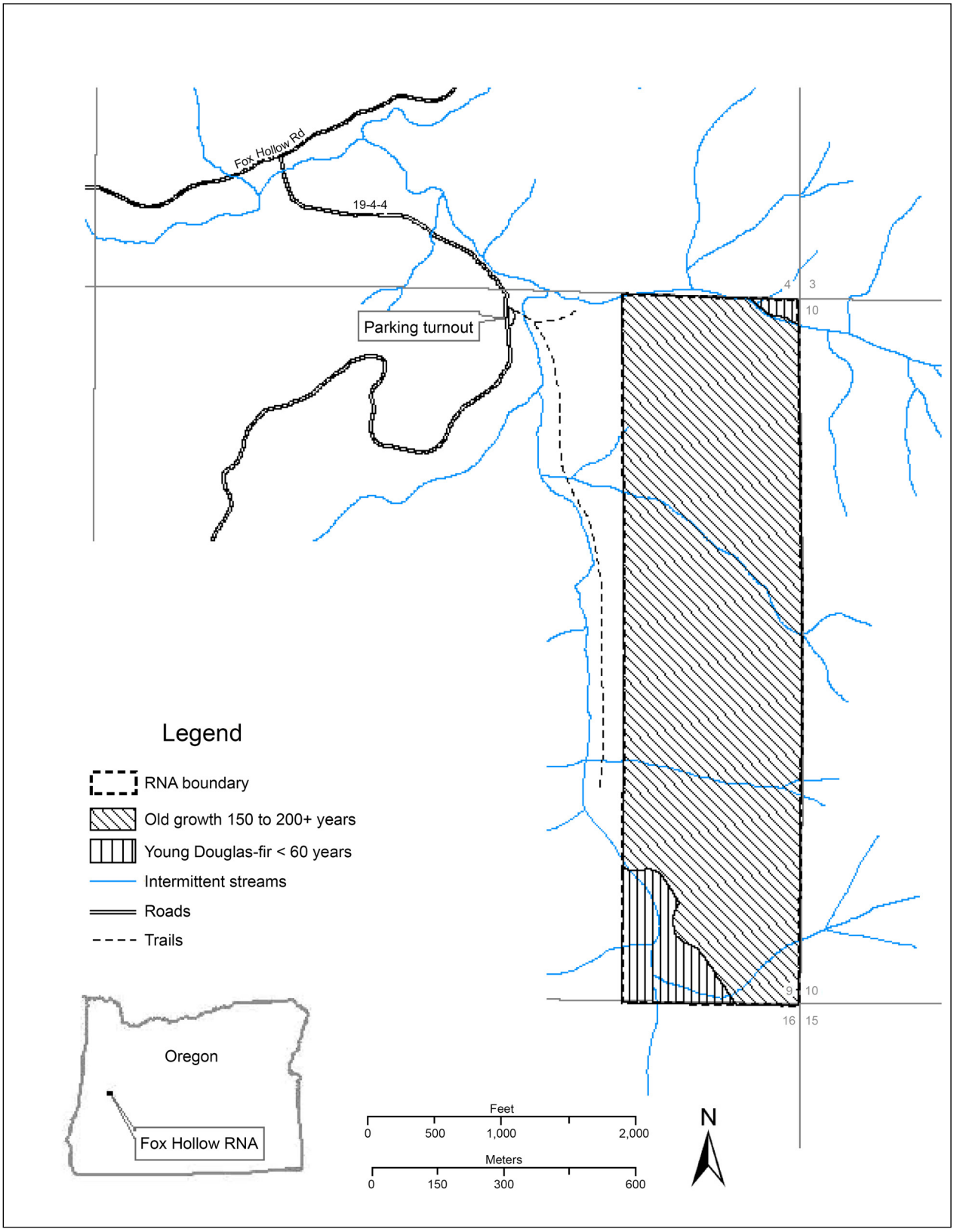

Figure 3—Fox Hollow Research Natural Area (RNA) vegetation and hydrology.

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-m^2 (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 associations[2] (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.

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[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 PSME/TODI[a]		Plot 2 PSME/TODI		Plot 3 PSME/TODI		Plot 4 PSME/HODI-SYMPH	
	Frequency[b]	Cover	Frequency	Cover	Frequency	Cover	Frequency	Cover
Bare ground					7	1		
Coarse litter			7	4	4	+		
Fine litter	100	100	100	98	100	97	100	98
Moss	86	33	100	66	100	53	93	26
Lichen	82	5	75	3	79	5	89	6
Corylus cornuta var. *californica*[c]	—	11	—	37	—	35		
Toxicodendron diversilobum	—	16	—	14	—	7		
Holodiscus discolor			—	9				
Symphoricarpos albus	—	1	—	1			—	1
Rosa gymnocarpa	—	1	—	+				
Berberis nervosa	—	7					—	1
Lonicera ciliosa			—	+	—	+	—	3
Adenocaulon bicolor	11	1	4	+	4	+	64	8
Osmorhiza berteroi	11	1	14	1	11	1	43	1
Polystichum munitum	39	27	14	8	39	18		
Trientalis borealis ssp. *latifolia*	25	2	21	1	29	2	32	2
Festuca occidentalis	7	+	7	+	14	+	36	1
Synthyris reniformis	36	1	32	1	25	2	14	+
Melica subulata	21	+	25	+	61	1	54	1
Galium triflorum	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 PSME/TODI[a]		Plot 2 PSME/TODI		Plot 3 PSME/TODI		Plot 4 PSME/HODI-SYMPH	
	Frequency[b]	Cover	Frequency	Cover	Frequency	Cover	Frequency	Cover
Galium trifidum ssp. *columbianum*	14	+	11	+	21	1	21	1
Sanicula crassicaulis	7	+	21	1	21	2		
Linnaea borealis	11	+	11	3	11	1		
Campanula scouleri	29	1	18	1				
Fragaria vesca ssp. *bracteata*	21	1	25	1			4	+
Festuca subulata	11	+					14	1
Moehringa macrophylla	7	+			4	+		
Bromus hordaceous			11	+	14	+	18	1
Iris tenax			7	+	7	+	4	+
Collomia heterophylla			14	1	4	+		
Nemophila parviflora			11	+	21	1		
Ligusticum apiifolium			7	+	4	1		
Satureja douglasii			4	+				
Anisocarpus madioides			14	+	7	+	68	9
Cardamine pulcherrimum					14	+	14	+
Pteridium aquilinum							18	4
Cynoglossum grande							18	3
Festuca californica							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.

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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.

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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

The following people merit recognition for their contributions. Jay Ruegger, geographic information system specialist, created the map in figure 1, and Chris Langdon, wildlife biologist, Upper Willamette Resource Area, Eugene District, BLM, reviewed and improved the list of animals in appendix 5. We also thank the three manuscript reviewers: Todd Wilson, wildlife biologist and research natural area coordinator, U.S. Forest Service, Pacific Northwest Research Station; Cindy McCain, forest ecologist, Siuslaw and Willamette National Forests; and Nancy Sawtelle, BLM Eugene District plant ecologist, for reviewing the manuscript. The project is funded through the BLM Eugene District and is administratively supported by the USDA Forest Service Pacific Northwest Research Station.

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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Carroll, G.C.; Carroll, F.E. 1978. Studies on the incidence of coniferous needle endophytes in the Pacific Northwest. Canadian Journal of Botany. 56(24): 3034–3043.

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Appendix 1—Plants[1 2]

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

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

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

Scientific name	Common name
Senecio jacobaea L.	Tansy ragwort
Sherardia arvensis L.	Blue fieldmadder
Stachys chamissonis Benth. var. *cooleyae* (A. Heller) G. Mulligan & D. Munro	Coastal hedgenettle
Stellaria sp.	Starwort
Synthyris reniformis (Dougl. ex Benth.) Benth.	Snowqueen
Tellima grandiflora (Pursh) Dougl. ex Lindl.	Bigflower tellima
Thermopsis montana Nutt.	Mountain goldenbanner
Tiarella trifoliata L.	Threeleaf foamflower
Trientalis borealis Raf. ssp. *latifolia* (Hook.) Hultén	Broadleaf starflower
Trifolium bifidum Gray	Notchleaf clover
Trifolium microdon Hook. & Arn.	Thimble clover
Trillium ovatum Pursh	Pacific trillium
Vancouveria hexandra (Hook.) Morr. & Dec.	Inside-out flower
Veronica arvensis L.	Corn speedwell
Vicia americana Muhl. ex Willd.	American vetch
Viola sempervirens Greene	Evergreen violet
Wyethia angustifolia (DC.) Nutt.	California compassplant
Grasses, sedges, and rushes:	
Aira caryophyllaea L.	Silver hairgrass
Carex obnupta L.H. Bailey	Slough sedge
Carex sp.	Sedge
Cynosurus echinatus L.	Bristly dogstail grass
Elymus glaucus Buckl.	Blue wildrye
Festuca californica Vasey	California fescue
Festuca occidentalis Hook.	Western fescue
Festuca subulata Trin.	Bearded fescue
Holcus lanatus L.	Common velvetgrass
Juncus sp.	Rush
Luzula multiflora (Ehrh.) Lej. ssp. *multiflora*	Common woodrush
Melica subulata (Griseb.) Scribn.	Alaska oniongrass
Poa trivialis L.	Rough bluegrass
Scirpus microcarpus J. Presl & C. Presl.	Panicled bulrush
Trisetum cernuum 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:	
Alectoria sarmentosa	(Ach.) Ach.
Alectoria vancouverensis	(Gyelnik) Gyelnik ex Brodo & D. Hawksw.
Bryoria capillaris	(Ach.) Brodo & D. Hawksw.
Bryoria fremontii	(Tuck.) Brodo & D. Hawksw.
Bryoria friabilis	Brodo & D. Hawksw.
Chaenotheca brunneola	(Ach.) Müll.
Chaenotheca furfuracea	(L.) Tibell
Chrysothrix sp.	Mont.
Cladonia cariosa	(Ach.) Sprengel
Cladonia chlorophaea group	(Flörke ex Sommerf.) Sprengel
Cladonia fimbriata	(L.) Fr.
Cladonia furcata	(Hudson) Schrader
Cladonia ochrochlora	Flörke
Cladonia pyxidata	(L.) Hoffm.
Cladonia subsquamosa	Kremp.
Cladonia transcendens	(Vainio) Vainio
Cladonia verruculosa	(Vainio) Ahti
Evernia prunastri	(L.) Ach.
Fuscopannaria pacifica	P. M. Jørg.
Hypogymnia enteromorpha	(Ach.) Nyl.
Hypogymnia imshaugii	Krog
Hypogymnia inactiva	(Krog) Ohlsson
Hypogymnia physodes	(L.) Nyl.
Hypogymnia tubulosa	(Schaerer) Hav.
Icmadophila ericetorum	(L.) Zahlbr.
Leptogium gelatinosum	(With.) J. R. Laundon
Leptogium polycarpum	P. M. Jørg. & Goward
Leptogium tenuissimum group	(Dickson) Körber
Letharia vulpina	(L.) Hue
Lobaria pulmonaria	(L.) Hoffm.
Melanelia exasperatula	(De Not.) O. Blanco et al.
Melanelixia subaurifera	(Nyl.) O. Blanco et al.
Nephroma helveticum	Ach.
Nephroma laevigatum	Ach.
Nephroma resupinatum	(L.) Ach.
Parmelia sulcata	Taylor
Peltigera britannica	(Gyelnik) Holt.
Peltigera collina	(Ach.) Schrader
Peltigera leucophlebia	(Nyl.) Gyelnik
Peltigera membranacea	(Ach.) Nyl.
Peltigera neopolydactyla	(Gyelnik) Gyelnik
Peltigera praetextata	(Flörke ex Sommerf.) Zopf
Physica adscendens	(Fr.) H. Olivier
Platismatia glauca	(L.) W. L. Culb. & C. F. Culb.
Platismatia herrei	(Imshaug) W. L. Culb. & C. F. Culb.
Pseudocyphellaria anomala	Brodo & Ahti

Species name	Authorities
Pseudocyphellaria anthraspis	(Ach.) H. Magn.
Pseudocyphellaria crocata	(L.) Vainio
Ramalina dilacerata	(Hoffm.) Hoffm.
Ramalina farinacea	(L.) Ach.
Ramalina thrausta	(Ach.) Nyl.
Sphaerophorus globosus	(Hudson) Vainio
Sphaerophorus tuckermanii	Räsänen
Sphaerophorus venerabilis	Wedin, Högnabba & Goward
Tuckermannopsis chlorophylla	(Willd.) Hale
Tuckermannopsis orbata	(Nyl.) M. J. Lai
Usnea sp.	Dill. ex Adans.
Usnea filipendula group	Stirton
Usnea flavocardia	Räsänen
Usnea glabrata	(Ach.) Vainio
Usnea longissima	Ach.
Usnea scabrata	(Ach.) Vainio
Crustose lichen:	
Ochrolechia oregonensis	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
Amphidium californicum (Hampe ex Müll. Hal.) Broth.	California amphidium moss
Antitrichia curtipendula (Hedw.) Brid.	Antitrichia moss
Atrichum selwynii Austin	Selwyn's atrichum moss
Blepharostoma trichophyllum (L.) Dumort.	—
Bryum sp.	Bryum moss
Buxbaumia sp.	Buxbaumia moss
Cephalozia lunulifolia (Dumort.) Dumort	—
Chiloscyphus coadunatus (Sw.) R.M. Schust. & J.J. Engel	—
Chiloscyphus pallescens (Ehrh. ex Hoffm.) Dumort.	—
Chiloscyphus profundus (Nees) J.J. Engel & R.M. Schust.	—
Claopodium bolanderi Best	Bolander's claopodium moss
Claopodium whippleanum (Sull.) Renauld & Cardot	Whipple's claopodium moss
Conocephalum conicum (L.) Dumort.	—
Dendroalsia abietina (Hook.) E. Britton	Dendroalsia moss
Dicranoweisia cirrata (Hedw.) Lindb. ex Milde	Dicranoweisia moss
Dicranum howellii Renauld & Cardot	Howell's dicranum moss
Dicranum tauricum Sapeh.	Dicranum
Didymodon sp.	Didymodon moss
Didymodon fallax (Hedw.) R.H. Zander	Didymodon moss
Ditrichum sp.	Ditrichum moss
Epipterygium tozeri (Grev.) Lindb.	Tozer's epipterygium moss
Eurhynchium oreganum (Sull.) A. Jaeger	Oregon eurhynchium moss
Eurhynchium praelongum (Hedw.) Schimp.	Eurhynchium moss
Fissidens bryoides Hedw.	Bryoid fissidens moss
Fissidens ventricosus Lesq.	Fissidens moss
Frullania bolanderi Austin	—
Frullania californica (Austin) A. Evans	—
Frullania nisquallensis Sull.	—
Homalothecium fulgescens (Mitt. ex Müll. Hal.) E. Lawton	Tree mat homalothecium moss
Homalothecium nuttallii (Wilson) A. Jaeger	Nuttall's homalothecium moss
Hylocomium splendens (Hedw.) Schimp.	Splendid feather moss
Hypnum circinale Hook.	Hypnum moss
Isothecium cristatum (Hampe) H. Rob.	Isothecium moss
Isothecium myosuroides Brid.	Isothecium moss
Jungermannia sp.	Jungermannia moss
Lepidozia reptans (L.) Dumort.	—
Leucolepis acanthoneuron (Schwägr.) Lindb.	Leucolepis umbrella moss
Lophocolea sp.	—
Lophozia sp.	—
Lophozia incisa (Schrad.) Dumort.	—
Metaneckera menziesii (Hook.) Steere	Menzies' metaneckera moss
Neckera douglasii Hook.	Douglas' neckera moss
Orthotrichum consimile Mitt.	Orthotrichum moss
Orthotrichum lyellii Hook. & Taylor	Lyell's orthotrichum moss
Plagiochila porelloides (Torr. ex Nees) Lindenb.	—
Plagiomnium insigne (Mitt.) T. Kop.	Plagiomnium moss
Plagiomnium venustum (Mitt.) T. Kop.	Plagiomnium moss
Plagiothecium denticulatum (Hedw.) Schimp.	Toothed plagiothecium moss
Plagiothecium undulatum (Hedw.) Schimp.	Undulate plagiothecium moss

Scientific name and authorities	Common name
Polytrichum juniperinum Hedw.	Juniper polytrichum moss
Porella cordaeana (Huebener) Moore	—
Porella navicularis (Lehm. & Lindenb.) Lindb.	—
Porotrichum bigelovii (Sull.) Kindb.	Bigelow's porotrichum moss
Porotrichum vancouveriense (Kindb.) H.A. Crum	Vancouver porotrichum moss
Pseudotaxiphyllum elegans (Brid.) Z. Iwats.	Elegant pseudotaxiphyllum moss
Racomitrium elongatum Ehrh. ex Frisvoll	Elongate racomitrium moss
Radula complanata (L.) Dumort.	—
Rhizomnium glabrescens (Kindb.) T. Kop.	Rhizomnium moss
Rhytidiadelphus triquetrus (Hedw.) Warnst.	Rough goose neck moss
Riccardia latifrons (Lindb.) Lindb.	—
Riccardia multifida (L.) A. Gray	—
Riccia sp.	—
Scapania bolanderi Austin	—
Scapania undulata (L.) Dumort.	—
Scleropodium obtusifolium (A. Jaeger) Kindb.	Obtuseleaf scleropodium moss
Syntrichia laevipila Brid.	—
Tetraphis pellucida Hedw.	Tetraphis moss
Timmiella crassinervis (Hampe) L.F. Koch	Timmiella moss
Trachybryum megaptilum (Sull.) Schof.	Trachybryum moss
Weissia controversa 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
Crucibulum crucibuliforme (Scop.) V.S. White	—
Fomitopsis pinicola (Sw.) P. Karst.	Red-belt conk
Galerina marginata (Batsch) Kühner	Deadly galerina
Helvella compressa (Snyder) N.S. Weber	Compressed elfin saddle
Helvella fibrosa (Wallr.) Korf	Fibrous elfin saddle
Helvella maculata N.S. Weber	Fluted brown elfin saddle
Hericium erinaceus (Bull.) Pers	Lion's mane
Hygrocybe punicea (Fr.) P. Kumm.	Scarlet waxy cap
Inocybe lilacina (Peck) Kauffman	Lilac inocybe
Inocybe sororia Kauffman	Corn silk inocybe
Lepiota clypeolaria (Bull.) P. Kumm.	Shaggy-stalked parasol
Lycoperdon marginatum Vittad.	Peeling puffball
Marasmius plicatulus Peck	Pleated marasmius
Naematoloma fasciculare (Huds.) P. Karst.	Sulfur tuft
Phaeolus schweinitzii (Fries) Pat.	Deer mushroom
Pseudohydnum gelatinosum (Scop.) P. Karst.	Toothed jelly fungus
Russula cyanoxantha (Schaeff.) Fr.	Variegated russula
Stropharia ambigua (Peck) Zeller	Questionable stropharia
Trametes versicolor (L.) Lloyd	Turkey tail
Tremella mesenterica (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	*Ambystoma gracile*	Northwestern salamander
	Ambystoma macrodactylum	Long-toed salamander
Dicamptodontidae	*Dicamptodon tenebrosus*	Pacific giant salamander
Plethodontidae	*Aneides ferreus*	Clouded salamander
	Ensatina eschscholtzi	Ensatina
	Plethodon dunni	Dunn's salamander
	Plethodon vehiculum	Western redback
Salamandridae	*Taricha granulosa*	Roughskin newt
Bufonidae	*Bufo boreas*	Western toad
Hylidae	*Pseudacris regilla*	Pacific treefrog
Ranidae	*Rana aurora*	Red-legged frog
Reptiles:		
Anguidae	*Elgaria coerulea*	Northern alligator lizard
	Elgaria multicarinata	Southern alligator lizard
Scincidae	*Eumeces skiltonianus*	Western skink
Boidae	*Charina bottae*	Rubber boa
Colubridae	*Contia tenuis*	Sharptail snake
	Diadophis punctatus	Ringneck snake
	Thamnophis elegans	Western terrestrial garter snake
	Thamnophis ordinoides	Northwestern garter snake
	Thamnophis sirtalis	Common garter snake
Iguanidae	*Sceloporus occidentalis*	Western fence lizard
Birds:		
Cathartidae	*Cathartes aura*	Turkey vulture
Accipitridae	*Accipiter cooperii*	Cooper's hawk
	Accipiter gentilis	Northern goshawk
	Accipiter striatus	Sharp-shinned hawk
	Buteo jamaicensis	Red-tailed hawk
Falconidae	*Falco columbarius*	Merlin
Phasianidae	*Bonasa umbellus*	Ruffed grouse
	Callipepla californica	California quail
	Dendragapus obscurus	Blue grouse
	Oreortyx pictus	Mountain quail
Columbidae	*Columba fasciata*	Band-tailed pigeon
	Zenaida macroura	Mourning dove
Strigidae	*Aegolius acadicus*	Northern saw-whet owl
	Asio otus	Long-eared owl
	Bubo virginianus	Great horned owl
	Glaucidium gnoma	Northern pygmy-owl
	Otus kennicottii	Western screech-owl
	Strix occidentalis caurina	Northern spotted owl
	Strix varia	Barred owl
Caprimulgidae	*Chordeiles minor*	Common nighthawk

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

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

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