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# Round Top Butte Research Natural Area: Guidebook Supplement 46

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

Front cover. Round Top Butte Research Natural Area. Oblique view looking north-northwest across the RNA toward The Nature Conservancy Preserve and the summit of Round Top Butte. Open areas are dominated by the Bluebunch wheatgrass-California oatgrass-Lemmon's needlegrass (*Pseudoroegneria spicata*-*Danthonia californica*-*Achnatherum lemmonii*) upland grassland. Soils are shallow, gravelly loam on the steep, south-facing slope of Round Top Butte.

## Abstract

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This guidebook describes major biological and physical attributes of the 243-ha (600-ac) Round Top Butte Research Natural Area. The area supports high-quality examples of valley upland grasslands and savanna of the Cascade foothills. Plant communities include Oregon white oak (*Quercus garryana*) savanna and open woodland with forbs and grasses; ponderosa pine (*Pinus ponderosa*)–Oregon white oak woodland; bluebunch wheatgrass–California oatgrass–Lemmon’s needlegrass (*Pseudoroegneria spicata*–*Danthonia californica*–*Achnatherum lemmonii*) grasslands; and tufted hairgrass (*Deschampsia cespitosa*)–California oatgrass vernaly flooded prairie.

Keywords: Research natural area, area of critical environmental concern, *Quercus garryana*, Oregon white oak, *Pinus ponderosa*, ponderosa pine, *Pseudoroegneria spicata*, bluebunch wheatgrass, *Danthonia californica*, California oatgrass, *Achnatherum lemmonii*, Lemmon’s needlegrass, valley grassland, savannah, and woodland.

## Preface

The research natural area (RNA) described in this supplement<sup>1</sup> is administered by the Medford District, Bureau of Land Management (BLM), U.S. Department of the Interior.

Round Top Butte RNA is part of a federal system<sup>2</sup> of natural areas established for research and educational purposes.<sup>3</sup> 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<sup>4</sup> 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.

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<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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].

<sup>4</sup> 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.

- 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.

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.<sup>5</sup>

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 Round Top Butte RNA for scientific or educational purposes should contact the Medford 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.

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<sup>5</sup> 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.

- 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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## Introduction

Round Top Butte Research Natural Area (RNA) is located in the foothills of the Cascade Mountains adjacent to the Rogue Valley 9.7 km (6 mi) northeast of Eagle Point in Jackson County, Oregon. The 243-ha (600-ac) site was proposed as an RNA in the Medford District Resource Management Plan/Environmental Impact Statement (USDI 1994) and was subsequently designated under the Record of Decision and Resource Management Plan (USDI 1995).

The Round Top site was established as a RNA because it supports high-quality examples of ecosystem types representative of the foothills of the western Cascade Mountains in southern Oregon (Kagan 2010). These include:

- Oregon white oak (*Quercus garryana*) savanna and open woodland with forbs and grasses.
- Ponderosa pine (*Pinus ponderosa*)-Oregon white oak woodland.
- Bluebunch wheatgrass-California oatgrass-Lemmon's needlegrass (*Pseudoroegneria spicata*-*Danthonia californica*-*Achnatherum lemmonii*) grasslands.
- Tufted hairgrass (*Deschampsia cespitosa*)-California oatgrass vernaly flooded prairie (ONHAC 2010).

In addition, the sticky whiteleaf manzanita-buckbrush (*Arctostaphylos viscida*-*Ceanothus cuneatus*)/bunchgrass chaparral and lowland mixed-conifer forest plant communities are also present at the site. Collectively, these six vegetation types are representative of native vegetation that historically existed in the valleys and foothills of southwestern Oregon and northwestern California (Greene 1985) (see app. 1 for a list of scientific and common names).

In 2011, the National Park Service recognized the ecological significance of Round Top Butte by designating the area as a National Natural Landmark (USDI NPS 2013). This designation acknowledges Round Top Butte as a predominantly unmodified mosaic of ecosystem types, which historically occupied valley bottoms and foothills in southwestern Oregon and northwestern California but which are largely absent today (Kagan 2010). At present, the site is characterized by upland valley grasslands, intermixed with shrublands, savanna, and forest communities. The site also supports forest dominated by old-growth Douglas-fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), and ponderosa pine. Round Top Butte persists today as the best example of the spectrum of plant communities that occupied the valleys and foothills of southern Oregon and northern California prior to Euro-American settlement (USDI NPS 2013).

## Access and Accommodations

Round Top Butte RNA is accessible by vehicle from several directions, although four-wheel drive is needed once off main roads, especially during wet months. The primary access from Eagle Point (north-northeast of Medford, Oregon) is via Highway 62, the Butte Falls highway, and Obenchain Road. From Obenchain Road, take Bureau of Land Management (BLM) road 35-2E-18 to the locked gate at the end of the graveled portion. A key may be obtained from the BLM for the gate lock and a four-wheel drive vehicle can traverse the last 3/4 mile; however, driving this road should be avoided during wet months and fire season. During these periods, access to the northeast corner of the RNA in section 15 is gained by walking the last 3/4 mile of the natural surface road (fig. 1).

Prior to visiting the site, obtain permission to access the area from the BLM, Medford District office in Medford, Oregon. Maps and additional directions to the area are available at this office. Lodging is available in Medford, Oregon.

## Environment

The RNA is situated within the Western Cascade ecoregion and straddles foothills overlooking the Rogue Valley. Section 15 contains gently rolling hills of mostly south-facing slopes, interspersed with flat areas and swales (fig. 2). Elevation ranges from 914 m (3,000 ft) at the north border to 768 m (2,520 ft) at the southwest corner. The Nature Conservancy manages an adjacent parcel of land (Round Top Butte Preserve) in section 10 that includes the south-facing flanks of Round Top Butte. Elevation drops abruptly from the peak at 1125 m (3,690 ft) to a long narrow valley at 914 m (3,000 ft) that runs east-west along the length of the southern border (fig. 2). Round Top Butte is the highest peak in the area, and is surrounded on three sides by other ridges.

Round Top Butte RNA is situated on the slopes of the Western Cascade Mountains, between the geologically younger High Cascade province to the east and the alluvial land forms of the Western Oregon Interior Valley Province to the west. Rocks in the Round Top Butte area originated from volcanic eruptions 25 to 35 million years ago during the Oligocene and late Miocene eras. Subsequent periods of uplifting, folding, faulting, intrusions, and erosion created the present land forms. The most common exposed rock types are andesite, breccia, and tuff (USDA SCS 1993). Volcanic rock outcroppings are present on the flanks of Round Top Butte and at several locations in section 15. Basalt cobbles are scattered across the hillside of the butte and throughout the RNA. Seasonal streams have eroded thin soil layers to

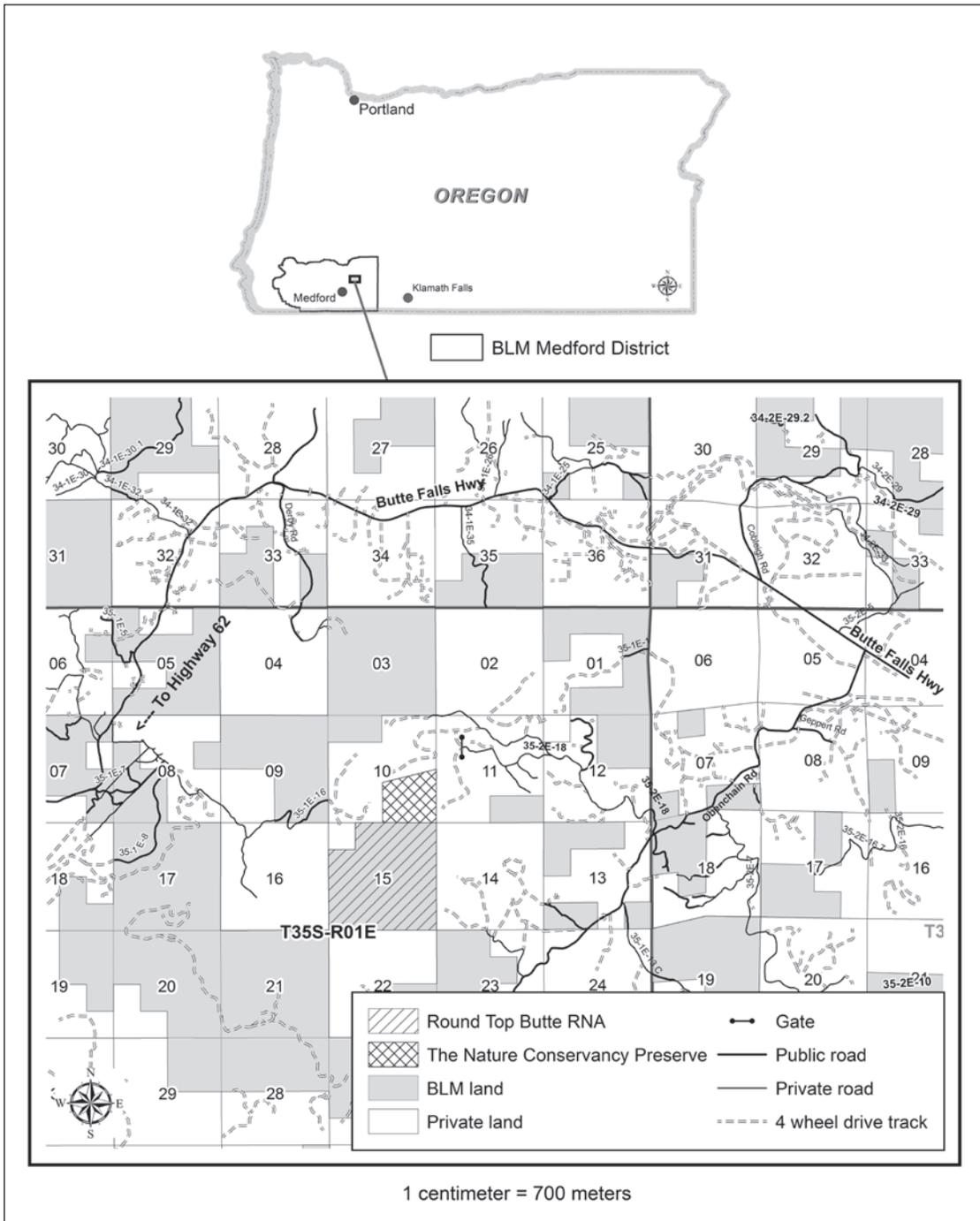


Figure 1—Round Top Butte Research Natural Area (RNA) location and access. BLM = Bureau of Land Management.

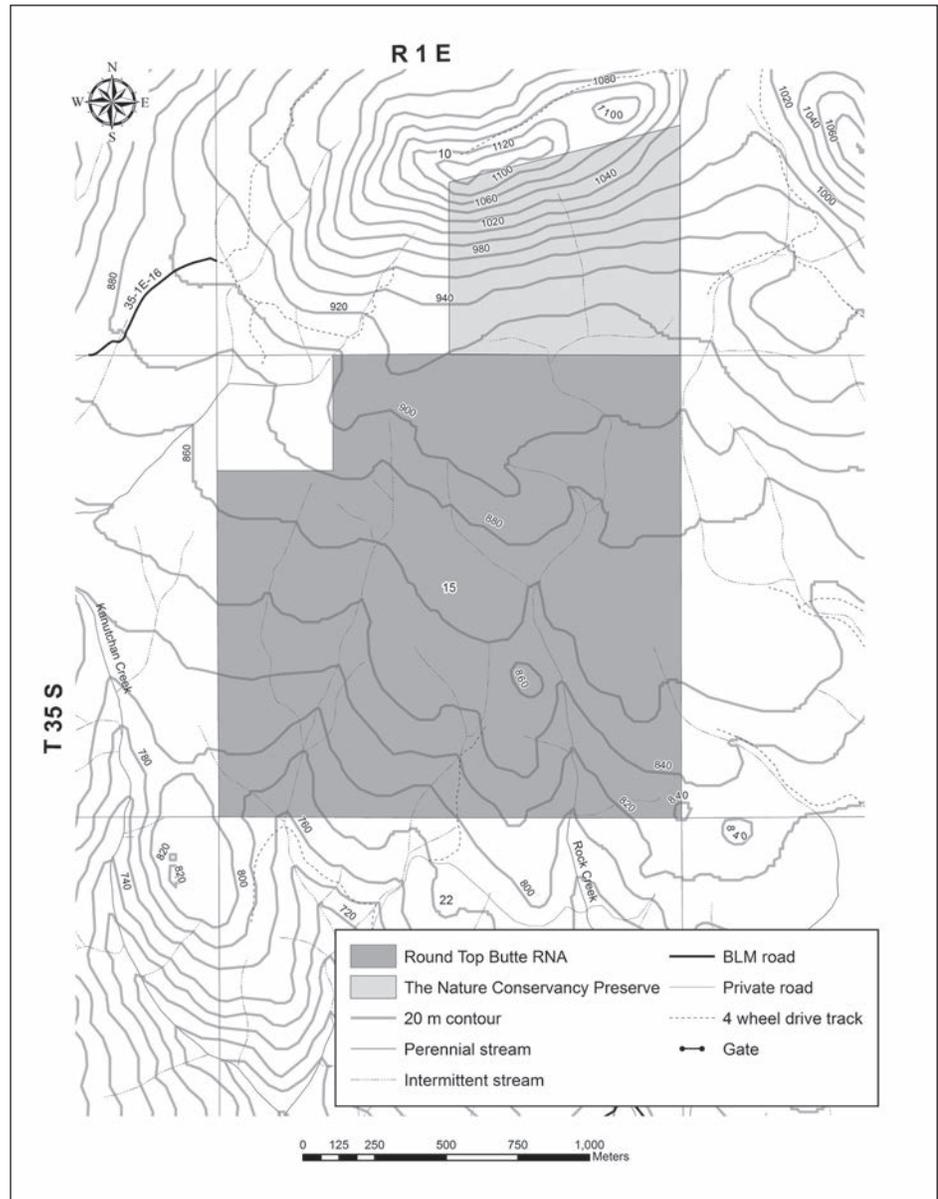


Figure 2—Round Top Butte Research Natural Area (RNA) topography, hydrology, and boundary showing landscape setting of the RNA in relation to The Nature Conservancy Preserve. BLM = Bureau of Land Management.

expose cobbles in shallow channels (fig. 3). Round Top Butte and adjacent Obenchain and Green Top Mountains are believed to be small lava cones (Kagan 2010, Wineteer 2001).

The soils are composed of weathered, volcanic clays. A few areas in the site have some significant soil buildup, but much of the site is rocky with very shallow soil. Soils have been mapped by the U.S. Soil Conservation Service and are classified as five different types. The primary differences have to do with the fineness of



Figure 3—Ephemeral creek bed on the Round Top Butte Research Natural Area composed of basalt rubble within grassland. Large camas (*Camassia leichtlinii*) is flowering within the creek bed. Adjacent, dry-site grassland species outside of the creek bed are mostly dried up.

the clays, the depth and productivity of the soils, and the existing vegetation. However, the latter may reflect fire history as much as soil type (Kagan 2010, Wineteer 2001). The soil series represented within the area are described below. They often occur as soil complexes, with two or more series co-occurring, or occurring with characteristics that are intermediate between two series.

#### **McNull—**

This soil series consists of moderately deep, well-drained soils on hill slopes, formed in colluvium from andesite, tuff, and breccia. Surface soil is loam; subsoil is clay loam, and cobbly clay. Depth to bedrock is 51 to 102 cm (20 to 40 in), permeability is slow, runoff is medium, and hazard of water erosion is moderate. McNull

soils are the most productive in the area, typically support closed forest, the timbered types, while the others support savanna and grassland vegetation

**McMullin—**

McMullin are generally shallow, well drained soils found on hill slopes and plateaus. They are formed in colluvium derived from igneous and metamorphic rock. The surface layer is gravelly loam and the subsoil gravelly clay loam. Depth to bedrock ranges from 31 to 51 cm (12 to 20 in), permeability is moderate, runoff is slow or medium, and hazard of water erosion is slight or moderate.

**Medco—**

The Medco series is moderately deep, moderately well-drained soil formed in colluvium and alluvium derived dominantly from andesite, tuff, and breccia. Surface soil is cobbly clay loam, and subsoils are cobbly clay loam and clay. Depth to bedrock is 51 to 102 cm (20 to 40 in), permeability is very slow, runoff is medium, and hazard of erosion is moderate. The Medco-McMullen stony clay complex and the McNell-McMullen shallow clay loam complex are the most prominent within the plateau located in the northern parts of section 15. These soils support savanna and grassland vegetation (Kagan 2010, USDA SCS 1993, Wineteer 2001).

**Carney—**

Carney are moderately deep, well drained soils found on alluvial fans and hill slopes. Derived mainly from tuff and breccia, all soil layers are clay. Depth to bedrock is 51 to 102 cm (20 to 40 in), permeability is very slow, runoff is slow, and hazard of erosion is slight. This heavy vertisol clay soil is most common within the moist bottomland benches at Round Top Butte RNA.

**Geppert—**

The Geppert series is moderately deep, well-drained soil occurring on plateaus and formed in colluvium from andesite. Surface soils are very cobbly loam while subsurface soils are extremely cobbly clay loam. Depth to bedrock ranges from 51 to 102 cm (20 to 40 in), permeability is moderate, runoff is slow, and hazard of erosion is slight.

The RNA lies in the middle of the lower third of 56-km (35-mi) long Little Butte Creek Watershed. The north and south forks join at Lake Creek to form the main stem of Little Butte Creek, which empties into the Rogue River about 35 km (22 mi) southwest of Eagle Point. High winter and spring flows and low or no summer flow characterize all streams in the watershed (Wheeler 1971).

Hydrology at Round Top involves runoff from precipitation and underground springs. First-order streams originating in or running through the RNA include

Rock Creek, a tributary of Lick Creek; seasonal tributaries of Kanutchen Creek; and ephemeral and intermittent streams (fig. 2). Rainfall and runoff accumulate in flat areas with impermeable clay soils to form wet meadows and vernal pools that persist through spring and early summer, depending on the amount of rainfall (Wineteer 2001).

Stream surveys conducted by the BLM Medford District during the summer of 1998 identified 14 non-fish-bearing stream reaches. This includes 0.55 km (0.34 mi) of perennial streams, 3.33 km (2.07 mi) of intermittent streams, and 1.37 km (0.85 mi) of ephemeral streams. Stream functioning condition was evaluated and grouped into three categories as follows:

- Properly functioning 0.9 km (0.57 mi)
- Functioning at risk with an upward trend 0.8 km (0.47 mi)
- Functioning at risk with no apparent trends 3.8 km (2.39 mi)

Streams were characterized as low gradient and low flow with narrow, shallow channels, resulting in above-average sediment deposition and fair to good channel stability. Reaches flowing through meadow areas were characterized as functioning at risk because they lack a large woody debris component and canopy coverage. Other stream sections considered at risk were in higher gradient areas that have had active slumping and reaches located near four wheel drive tracks and roads that have had sidewall erosion and sediment deposition (Wineteer 2001).

In the southeastern third of the section, Rock Creek drops approximately 61 m (200 ft) in elevation, cutting a small canyon through this part of the RNA. Rock Creek is fed by underground springs and is the only stream containing water throughout the year. Logjams and drops between pools create natural barriers to fish migration. During summer months, the stream is reduced to an interrupted flow. Recently fallen large downed trees and debris were observed in the streambed and canyon in 1997, indicating that the water level was high during winter flooding in 1997. Freshly eroded streambanks, slides, and rerouted channels also indicated flooding (Wineteer 2001).

## Climate

The RNA is situated on the border between climate zones 1 and 2. Both zones are classified as mesic with a Mediterranean climate of hot, dry summers and cool, wet winters. Most precipitation is received as rainfall. Climate zone 2 is characterized by more precipitation (> 89 cm [> 35 in] per year) than climate zone 1 (< 89 cm [> 35 in] per year) (USDA SCS 1993). From late fall through spring, unstable low-pressure air masses from the Pacific Ocean bring frequent storms, sometimes

accompanied by high winds. During the summer, stable high-pressure air masses bring generally clear skies and temperature inversions. However, during the summer months, the area is also prone to lightning storms, which produces a natural wildfire frequency of 5 to 12 years in the grassland and savanna fuel types (Kagan 2010).

The most comparable weather station is located at Howard Prairie Dam, Oregon (354060), about 37 km (23 mi) southeast of the RNA at 1402 m (4,600 ft) elevation. This weather station likely receives slightly more annual precipitation and a higher proportion of precipitation in the form of snow than actually occurs at Round Top Butte. 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 818 mm (32.2 in) per year. Thirteen percent of the average annual precipitation falls from May through August. Snowfall typically begins in November and often extends through April. January receives the heaviest average snowfall of 729 mm (28.7 in) (WRCC 2012). Table 1 provides an approximation of precipitation and temperature regimes affecting the area.

## Vegetation

Round Top Butte RNA contains a mosaic of upland grasslands, ponderosa pine-oak savannas and woodlands, chaparral, and lower elevation mixed-conifer forests (fig. 4). Collectively, these vegetation communities represent the least modified, highest quality assemblage of their kind remaining in southwestern Oregon. With minor departures, vegetation in these communities are probably much like what they were prior to Euro-American settlement. The distribution of plant communities within the RNA reflects variations in soil type and depth, slope, and aspect (Kagan 2010, Wineteer 2001).

Major plant communities can be identified by a combination of dominant vegetation and physiographic characteristics. Brief descriptions of each plant community follow below.

**Table 1—Temperature and precipitation summary, 9/21/1960 to 9/30/2012—Howard Prairie Dam, Oregon (354060)**

Average minimum January temperature	0.8 °C (20.5 °F)
Average maximum January temperature	7.9 °C (37.3 °F)
Average minimum July temperature	10.8 °C (44.9 °F)
Average maximum July temperature	28.0 °C (79.1 °F)
Average annual precipitation	1145 mm (32.2 in)
Average June–August precipitation	63 mm (2.34 in)

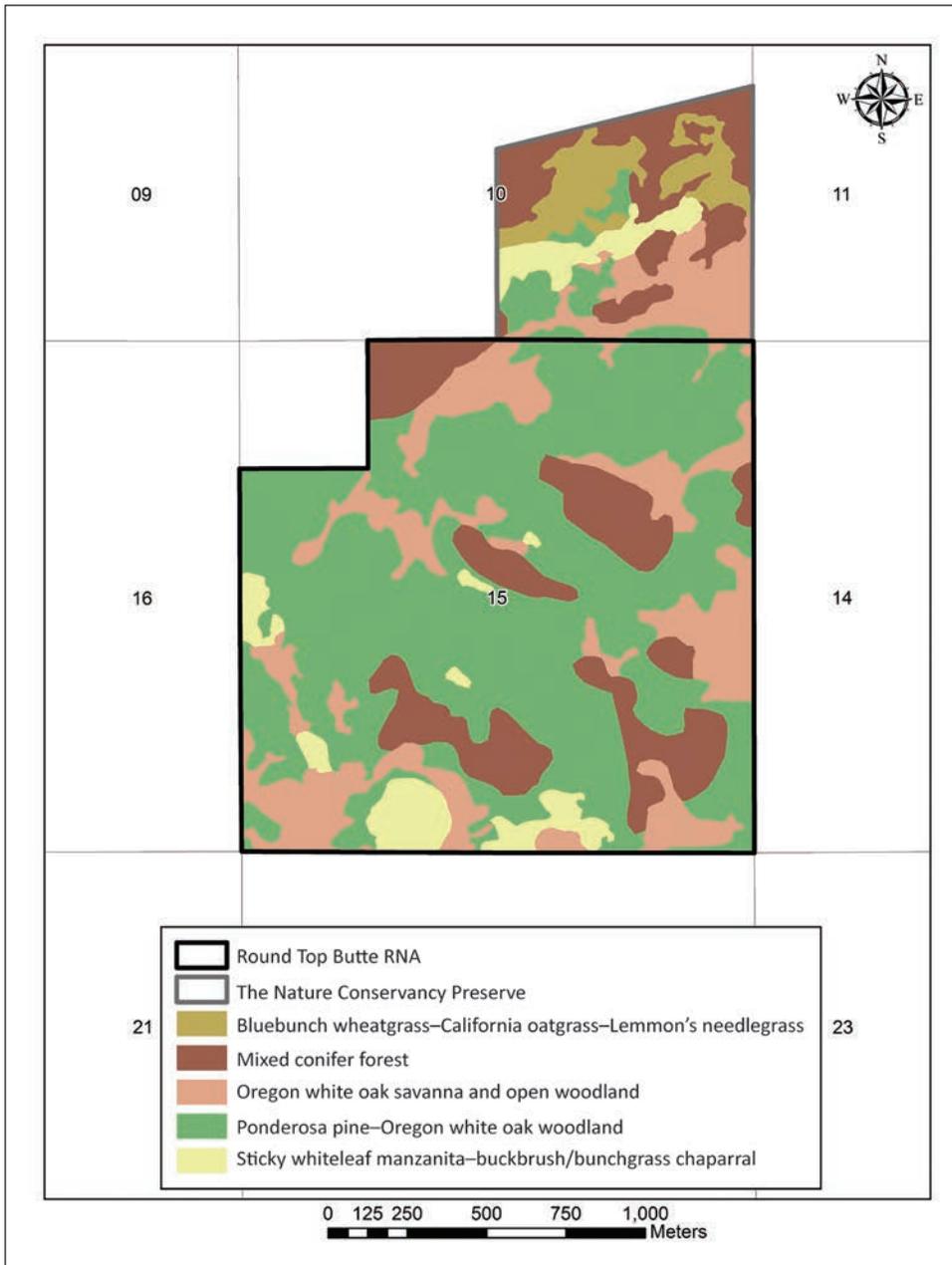


Figure 4—Round Top Butte Research Natural Area (RNA) plant communities.

**Bluebunch wheatgrass–California oatgrass–Lemmon’s needlegrass  
(*Pseudoroegneria spicata*–*Danthonia californica*–*Achnatherum lemmonii*)  
upland grassland—**

This type occurs on shallow, gravelly loam soils on the steep, south-facing slope of Round Top Butte and is typically dominated by the native bunchgrasses such as bluebunch wheatgrass, California oatgrass, Lemmon’s needlegrass, Roemer’s fescue (*Festuca roemeri*), and prairie Junegrass (*Koeleria macrantha*). Native forbs

characteristic of this plant community include deltoid balsamroot (*Balsamorhiza deltoidea*), California sandwort (*Minuartia californica*), Douglas' stitchwort (*Minuartia douglasii*), silverleaf phacelia (*Phacelia hastata*), bluehead gilia (*Gilia capitata*), large camas (*Camassia leichtlinii*), meadow deathcamas (*Zigadenus venenosus*), and California knotweed (*Polygonum californicum*) (see front cover) (Kagan 2010, Wineteer 2001).

Introduced species have become established within this community, especially in areas with disturbed soils. The most conspicuous invasive species include wild oat (*Avena fatua*), soft brome (*Bromus hordeaceus*), hedgehog dogtail (*Cynosurus echinatus*), medusahead (*Taeniatherum caput-medusae*), prickly lettuce (*Lactuca serriola*), and moth mullein (*Verbascum blattaria*). This site is an example of the plant community described by Franklin and Dyrness (1988) as occurring on xeric grassy balds on south-facing valley hillsides with shallow, rocky soils (front cover). Surrounding trees or shrubs do not appear to be encroaching into the meadow (Kagan 2010, Wineteer 2001).

**Oregon white oak savanna or open woodland with forbs or grasses (*Quercus garryana*–*Q. kelloggii*/*Danthonia californica*–*Achnatherum lemmonii* oak/grass savanna)—**

The Round Top Butte grasslands are treated here as savannas. Although some ecologists question whether there are true savannas in the United States, Agee (1993) defined savannas in the Pacific Northwest as shrub/grassland communities with less than 30 percent tree cover and less than 50 trees per hectare (or 49-ft spacing between trees).

Patches of oak/grass savanna are scattered throughout the RNA where soils are predominantly Carney clays. They have sticky shrink-swell soils, which are often moist or have standing pools of water during rainy months. Scattered, large individuals of Oregon white oak and ponderosa pine occur on the margins of savanna openings (fig. 5) (Kagan 2010, Wineteer 2001).

Patches of buckbrush (*Ceanothus cuneatus*) or sticky whiteleaf manzanita (*Arctostaphylos viscida*) occur as dominant shrubs in the driest parts of the savannas. California oatgrass dominates in open meadows, whereas Roemer's fescue dominates under trees and shrubs and in areas with deeper or siltier soil. Native bunchgrasses—California oatgrass, Roemer fescue, prairie Junegrass, and Lemmon's needlegrass—form the majority of vegetative groundcover in the savannas. Major herbs include annual agoseris (*Agoseris heterophylla*), common yarrow (*Achillea millefolium*), woodland strawberry (*Fragaria vesca*), carrotleaf horkelia (*Horkelia daucifolia*), and barestem biscuitroot (*Lomatium nudicaule*). Nonnative



Figure 5—Oregon white oak, California black oak, ponderosa pine, and Pacific madrone forming a semi-closed overstory. Oregon white oak seedling in foreground is surrounded by native bunchgrasses, and the shrubs poison oak and baldhip rose.

species have also become established within the savanna, including soft brome, hedgehog dogtail, and medusahead (Wineteer 2001). The oak/grass savanna at Round Top Butte has previously been described as the Oregon white oak/hedgehog dogtail plant association<sup>1</sup> (Atzet et al. 1996).

<sup>1</sup> 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 associations are generally defined by the dominant or characteristic species that 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., Oregon white oak/hedgehog dogtail = *Quercus garryana*/*Cynosurus echinatus*). Life form layers are separated by a “/”. Co-dominants within a layer are separated by a “.”.

Oak/grass savannas were historically more widespread throughout the Willamette, Umpqua, and Rogue Valleys (Franklin and Dyrness 1988). Before the early 1900s, lightning and anthropogenic fires maintained open savannas and prevented later successional species, such as Douglas-fir and incense cedar, from becoming established and forming mixed-hardwood/conifer woodlands. During the past 100 years, cessation of Native American burning practices, establishment of fire suppression policies and management, and urban and rural development have significantly contributed to the diminution of the oak/grass savanna community in Oregon. Past overgrazing and fire suppression practices have also contributed to the establishment of nonnative annual grasses and forbs that have changed the original species composition of grasslands and oak savannas (Riegel et al. 1992). In the absence of a natural fire regime, encroachment of conifers and shrubs also poses a threat to the oak/grass savanna ecosystem.

**Ponderosa pine–Oregon white oak woodland (*Pinus ponderosa*–*Quercus garryana*–*Q. kelloggii*/*Ceanothus cuneatus*–*Arctostaphylos viscida*/*Danthonia californica*–*Festuca roemerii* woodland)—**

Mixed conifer/hardwood woodlands occur on sites with loamier clay soils. Oregon white oak, California black oak, ponderosa pine, and Pacific madrone (*Arbutus menziesii*) compose the overstory (fig. 6). Patches of Douglas-fir and incense cedar occur on northerly aspects, while pockets of sticky whiteleaf manzanita and buckbrush occupy sites with relatively shallow soil. Grasses and herbs generally occur with less abundance in the woodlands than in the savannas. Typical grasses in the woodlands include the native bunchgrasses California oatgrass, Roemer's fescue, California fescue (*F. californica*), Sandberg bluegrass (*Poa secunda*), prairie Junegrass, and Lemmon's needlegrass. Most of the same herbs occur in the ponderosa pine-Oregon white oak woodland as occur in the oak/grass savanna. However, additional shrub species present include poison oak (*Toxicodendron diversilobum*), western serviceberry (*Amelanchier alnifolia*), birchleaf mountain mahogany (*Cercocarpus betuloides* var. *betuloides*) (Cook and Sundberg 2013), baldhip rose (*Rosa gymnocarpa*), and deerbrush (*Ceanothus integerrimus*). The invasive annual grasses hedgehog dogtail and medusahead occupy some savanna and woodland areas along with yellow star-thistle (*Centaurea solstitialis*), a highly invasive, annual herbaceous species (Wineteer 2001).

According to Franklin and Dyrness (1988), much of the Willamette, Umpqua, and Rogue interior valleys were historically oak/grass savanna maintained by human-caused fires. Many former savannas have been replaced by closed *Quercus* woodlands since the 1850s when most Native Americans were removed and their active burning practices thus ended, followed by active fire suppression methods



Figure 6—Oak/grass savanna and open woodland with Oregon white oak patches alternating with native bunchgrasses (California oatgrass, Roemer’s fescue, prairie Junegrass, and Lemmon’s needlegrass), large camas and diverse mix of herbs.

adopted in the early 1900s. The ponderosa pine/oak woodlands are well represented at Round Top Butte. They are best characterized as examples of the ponderosa pine/California black oak association (Atzet et al. 1996).

**Sticky whiteleaf manzanita–buckbrush/bunchgrass chaparral (*Arctostaphylos viscida*–*Ceanothus cuneatus*/*Achnatherum lemmonii*–*Festuca roemerii* chaparral)—**

Chaparral occurs predominantly on xeric sites with poor soil development (fig. 7). A shrub overstory of sticky whiteleaf manzanita and buckbrush occurring as major dominants is supplemented by a wide variety of other more minor shrubs within this vegetation type. This includes deerbrush, poison oak, and birchleaf mountain



Figure 7—Chaparral composed of buckbrush and perennial bunchgrasses occupying xeric, rocky sites with poor soil development.

mahogany. Understory bunchgrasses consist primarily of Roemer's fescue, Lemmon's needlegrass, California oatgrass, and prairie Junegrass. Shrubs in this plant community have protected native bunchgrasses from heavy grazing (USDI BLM site description). Conspicuous herbs include bigflower agoseris (*Agoseris grandiflora*), common yarrow, woodland strawberry, carrotleaf horkelia, Roesl's penstemon (*Penstemon roezlii*), and Pacific hound's tongue (*Cynoglossum grande*) (Wineteer 2001).

Detling (1961) considered the chaparral plant community of the Rogue Valley to be an extension of California chaparral types, more prominent in this area than in

the slightly more mesic Umpqua Valley and Willamette Valley to the north. Fire is an integral part of fire-dependant chaparral communities. However, in the absence of fire in southwestern Oregon, chaparral may indefinitely occupy the most xeric sites, or be successional to oak or ponderosa pine forest encroachment (Detling 1961).

**Ponderosa pine–sugar pine (*Pinus lambertiana*)–Douglas-fir–incense cedar lower elevation mixed-conifer forest—**

Patches of mixed-conifer forest occur in sections 10 and 15 on sites with either north aspects or deep, well-drained loamy soils. Dominant overstory conifers include Douglas-fir, ponderosa pine, sugar pine, and incense cedar with white fir (*Abies concolor*) occurring as a minor component at higher elevations. Hardwood tree species include Pacific madrone and California black oak. Younger dense stands contain sticky whiteleaf manzanita and buckbrush, which are eventually shaded out by conifers. Poison oak, Piper’s barberry (*Berberis piperiana*), deerbrush, baldhip rose, creeping snowberry (*Symphoricarpos mollis*), common whipplea (*Whipplea modesta*), and three species of honeysuckle (*Lonicera* spp.) are characteristic shrubs. The understory is dominated by the native bunchgrasses California fescue and western fescue (*Festuca occidentalis*). American vetch (*Vicia americana* ssp. *americana*) is a widespread herbaceous species (Kagan 2010, Wineteer 2001). This vegetation assemblage has previously been described as a Douglas-fir-ponderosa pine/poison oak plant association (Atzet et al. 1996).

Bigleaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), white alder (*Alnus rhombifolia*), hazelnut (*Corylus cornuta* var. *californica*), redosier dogwood (*Cornus sericea* ssp. *sericea*), black hawthorn (*Crataegus douglasii*), and field horsetail (*Equisetum arvense*) are the major riparian vegetation bordering Rock Creek (Wineteer 2001).

A list of scientific and common names for vascular plants known to occur within the RNA appears in appendix 1.

## Fauna

Amphibians, reptiles, birds, and mammals known or expected to occur within the RNA are listed in appendix 2. These lists have been derived from field observation (Kagan 2010, USDI BLM 1998, Wineteer 2001) and published literature (Csuti et al. 1997), using species distribution, life history characteristics, and availability of habitat within the RNA as criteria for inclusion on the list.

## Disturbance History

The Northern Takelma, a subgroup of the Takelma people, occupied the area east of the Rogue River and north of Little Butte Creek. They may have visited the Round Top Butte area because of the abundant food sources, such as deer, elk, jackrabbit, squirrel, acorns, camas, mariposa lily, brodiaea, manzanita berries, pine nuts, tarweed, and grass seeds (Atwood and Gray 1995). The area also contains the toolstones jasper and chert (Winthrop 1997).

The Round Top Butte area may have been intentionally burned by the Takelmas. Native peoples were known to have regularly set small fires in the valleys and surrounding hills of the Rogue Valley to achieve a variety of management purposes that included:

- Driving deer and elk into brush fences and snares
- Increasing forage habitat for wildlife
- Harvesting tarweed and grass seeds
- Promoting growth of edible plants
- Reducing brush around oak trees to make gathering acorns easier
- Cultivating tobacco
- Collecting insects from grasslands
- Removing protective cover from enemies during warfare
- Communicating with tribal members or members of other tribes
- Engaging in ceremonial activities (Pullen 1996)

Historical records indicate that open oak savannas throughout the Oregon interior valleys were more prevalent before 1916 when the Forest Service implemented an active fire suppression policy. Prior to that time, lightning strikes and fires started by Native Americans, and later by pioneers, created a more frequent fire regime, which removed underbrush and later successional species, such as ponderosa pine, incense cedar, and Douglas-fir from the savannas (Atzet and Wheeler 1982, Pullen 1996).

Settlement of southern Oregon by Euro-Americans increased substantially after gold was discovered in Jacksonville in 1852. Newcomers settled throughout the Rogue Valley, using open savannas and grasslands for agriculture and livestock ranching. Conflicts over land between miners and settlers and Native Americans culminated in removal of the remaining members of the Takelma Tribe in 1856 to the Siletz and Grande Ronde Reservations in northwestern Oregon (Wineteer 2001).

Blackened tree trunks and charcoal pieces observed throughout the RNA are evidence of past fire activity. Official fire reports dating back to 1956 indicate five

small wildfires started and were suppressed in sections 10 and 15 between 1956 and 1998 (Dinwiddie 1997).

Exclusion of a natural fire regime has resulted in encroachment of shrubs and conifers along the edges of open oak/grass savanna areas. Underbrush and tree density have increased in woodlands and forest areas, increasing fire fuel loads and the risk of high-intensity, stand-replacement fires (Wineteer 2001).

The open meadows and ponderosa pine/oak savannas at Round Top Butte have historically been managed by Euro-Americans for livestock grazing. Cattle, horses, goats, and sheep grazed throughout the Round Top area from around the 1880s to the early 1980s. Reports indicate the area was heavily grazed by cattle for more than 100 years. Angora goats roamed the area and grazed on the slopes of Round Top Butte during World War II. A herd of 100 to 150 horses ran and grazed in the area sometime between 1956 and 1966 (USDI BLM 1986). Sheep grazed in the mid-1900s in the southeast quadrant of section 15 (USDI BLM 1997). Deer and elk have always foraged on native bunchgrasses and shrubs throughout the area. Cattle have not grazed in the area since sometime before 1988 (Wineteer 2001).

## Research History

The following research and monitoring reports and publications have been undertaken within Round Top Butte RNA.

Atzet, T.; White, D.E.; McCrimmon, L.A.; Martinez, P.A.; Fong, P.R.; Randall, V.D. 1996. Field guide to the forested plant associations of southwestern Oregon.

Johnson, T. 1980. Soil-vegetation inventory.

Kagan, J.S. 2010. Evaluation of Round Top Butte, Jackson County, Oregon, for its merit in meeting national significance criteria as a National Natural Landmark to represent upland valley grasslands and savanna in the North Pacific Border biophysiological province.

Murray, M.P.; Kagan, J. 2001. Round Top Butte—evaluation for National Natural Landmark status.

Schuller, R.; Greene, S.; Wineteer, M.L. 2012. Long-term vegetation monitoring data.

Wineteer, M.L. 2001. Round Top Butte Area of Critical Environmental Concern/Research Natural Area—draft management plan.

Several possible research projects well suited to the ecological setting of the Round Top Butte RNA would be desirable to explore in the future:

- Determine the role of fire in plant community development, composition, and production.
- Monitor changes in plant community composition in response to prescribed fire.
- Monitor changes in plant community composition in response to climate change, especially across ecotones.
- Study the impact of native herbivores on plant community development.

## Maps

Maps applicable to Round Top Butte RNA: Topographic—Obenchain Mountain, Oregon, 7.5 minute; 1:24,000 scale, 1988; Medford District—eastern portion, BLM transportation map, 1:126,720, 2004.

## Acknowledgments

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## English Equivalents

1 hectare (ha) = 2.47 acres (ac)

1 kilometer (km) = 0.62 mile (mi)

1 meter (m) = 3.28 feet (ft)

1 square meter (m<sup>2</sup>) = 10.76 square feet

1 centimeter (cm) = 0.394 inch (in)

1 millimeter (mm) = 0.0394 inch

Degrees Fahrenheit (°F) = 1.8 degrees Celsius + 32

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## Appendix 1—Plants<sup>1 2</sup>

Scientific name	Common name
Coniferous trees:	
<i>Abies concolor</i> (Gord. & Glend.) Lindl. ex Hildebr.	White fir
<i>Calocedrus decurrens</i> (Torr.) Florin	Incense cedar
<i>Pinus lambertiana</i> Dougl.	Sugar pine
<i>Pinus ponderosa</i> Laws. & C. Laws.	Ponderosa pine
<i>Pseudotsuga menziesii</i> (Mirbel) Franco	Douglas-fir
Deciduous trees >8 m (26.3 ft) tall:	
<i>Acer macrophyllum</i> Pursh.	Bigleaf maple
<i>Alnus rhombifolia</i> Nutt.	White alder
<i>Arbutus menziesii</i> Pursh	Pacific madrone
<i>Cornus sericea</i> L. ssp. <i>sericea</i>	Redosier 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. ex Hook.	Oregon white oak
<i>Quercus kelloggii</i> Newb.	California black oak
Tall shrubs 2 to 8 m (6.6 to 26.3 ft) tall:	
<i>Amelanchier alnifolia</i> Nutt.	Western serviceberry
<i>Ceanothus integerrimus</i> Hook. & Arn.	Deerbrush
<i>Cercocarpus betuloides</i> Nutt. var. <i>betuloides</i>	Birchleaf mountain mahogany
<i>Holodiscus discolor</i> (Pursh) Maxim	Oceanspray
<i>Oemleria cerasiformis</i> (Torr. & A. Gray ex Hook. & Arn.) J.W. Landon	Indian plum
<i>Philadelphus lewisii</i> Pursh	Lewis' mockorange
<i>Prunus subcordata</i> Benth.	Klamath plum
Medium shrubs 0.5 to 2 m (1.6 to 6.6 ft) tall:	
<i>Arctostaphylos viscida</i> Parry	Sticky whiteleaf manzanita
<i>Berberis piperiana</i> (Abrams) McMinn	Piper's barberry
<i>Ceanothus cuneatus</i> (Hook.) Nutt.	Buckbrush
<i>Rosa eglanteria</i> L.	Sweetbriar rose
<i>Rosa gymnocarpa</i> Nutt.	Baldhip rose
<i>Rosa pisocarpa</i> A. Gray	Cluster rose
<i>Rubus parviflorus</i> Nutt.	Thimbleberry
<i>Spiraea douglasii</i> Hook.	Douglas' spirea
<i>Symphoricarpos albus</i> (L.) Blake	Common snowberry
<i>Symphoricarpos mollis</i> Nutt.	Creeping snowberry
<i>Toxicodendron diversilobum</i> (T. & G.) Greene	Poison oak
<i>Viburnum ellipticum</i> Hook.	Common viburnum

Low shrubs <0.5 m (1.6 ft) tall:

<i>Lonicera ciliosa</i> (Pursh) Poir. ex DC.	Orange honeysuckle
<i>Lonicera hispidula</i> (Lindl.) Douglas ex Torr. & A. Gray	Pink honeysuckle
<i>Lonicera interrupta</i> Benth.	Chaparral honeysuckle
<i>Rubus armeniacus</i> Focke	Himalayan blackberry
<i>Whipplea modesta</i> Torr.	Common whipplea

Ferns and allies:

<i>Cystopteris fragilis</i> (L.) Bernh.	Brittle bladderfern
<i>Polypodium glycyrrhiza</i> DC. Eat.	Licorice fern
<i>Polystichum munitum</i> (Kaulf.) Presl	Western swordfern
<i>Pteridium aquilinum</i> (L.) Kuhn.	Bracken fern

Herbs:

<i>Achillea millefolium</i> L.	Common yarrow
<i>Achyrachaena mollis</i> Schauer.	Blow wives
<i>Actaea rubra</i> Willd.	Red baneberry
<i>Adenocaulon bicolor</i> Hook.	American trailplant
<i>Agoseris grandiflora</i> (Nutt.) S. Greene	Bigflower agoseris
<i>Agoseris heterophylla</i> (Nutt.) S. Greene	Annual agoseris
<i>Allium acuminatum</i> Hook.	Tapertip onion
<i>Allium amplexans</i> Hook.	Narrowleaf onion
<i>Allium falcifolium</i> Hook. & Arn.	Scythleaf onion
<i>Amsinckia menziesii</i> (Lehm) A. Nels. & J.F. Macbr. var. <i>intermedia</i> (Fisch. & Mey.) Ganders	Common fiddleneck
<i>Anaphalis margaritacea</i> (L.) Benth. & Hook.	Western pearly everlasting
<i>Anchusa officinalis</i> L.	Common bugloss
<i>Anemone deltoidea</i> Hook.	Columbian windflower
<i>Antennaria argentea</i> Benth.	Silver pussytoes
<i>Aquilegia formosa</i> Fisch.	Western columbine
<i>Balsamorhiza deltoidea</i> Nutt.	Deltoid balsamroot
<i>Blepharipappus scaber</i> Hook.	Rough eyelashseed
<i>Bombycilaena californica</i> (Fisch. & A.E. Mey.) Holub. var. <i>californica</i>	Q-tips
<i>Brodiaea</i> sp.	Brodiaea
<i>Calochortus tolmiei</i> Hook. & Arn.	Tolmie star-tulip
<i>Calochortus uniflorus</i> Hook. & Arn.	Monterey mariposa lily
<i>Calycadenia truncata</i> DC.	Oregon western rosinweed
<i>Calypso bulbosa</i> (L.) Oakes	Fairy slipper
<i>Camassia leichtlinii</i> Baker & S. Wats.	Large camas
<i>Campanula prenanthoides</i> (Dur.) McVaugh	California harebell
<i>Cardamine hirsuta</i> L.	Hairy bittercress
<i>Cardamine nuttallii</i> E. Greene	Nuttall's toothwort
<i>Cardamine oligosperma</i> Torr. & A. Gray	Umbel bittercress

<i>Castilleja applegatei</i> Fern. sp. <i>pinetorum</i> (Fern.) Chuang & Heckard	Wavyleaf Indian paintbrush
<i>Castilleja pruinosa</i> Fern.	Frosted Indian paintbrush
<i>Castilleja tenuis</i> (A.A. Heller) Chuang & Heckard	Hairy Indian paintbrush
<i>Centaurea solstitialis</i> L.	Yellow star-thistle
<i>Centaurium muehlenbergii</i> (Griseb.) W. Wight ex Piper	Muehlenberg's centaury
<i>Cerastium glomeratum</i> Thuill.	Sticky chickweed
<i>Chamaesyce</i> sp.	Sandmat
<i>Chimaphila umbellata</i> (L.) Bartram	Pipsissewa
<i>Cichorium intybus</i> L.	Chicory
<i>Cirsium vulgare</i> (Savi.) Ten.	Bull thistle
<i>Clarkia amoena</i> (Lehm.) A. Nels. & J.F. Macks	Farewell to spring
<i>Clarkia lassenensis</i> (Eastw.) F.H. Lewis & M.E. Lewis	Mt. Lassen clarkia
<i>Clarkia purpurea</i> (W. Curtis) A. Nels. & J.F. Macbr. ssp. <i>quadrivulnera</i> (Dougl. ex Lindl.) F.H. Lewis & M.E. Lewis	Winecup clarkia
<i>Clarkia rhomboidea</i> Dougl.	Diamond clarkia
<i>Claytonia parviflora</i> Hook.	Streambank springbeauty
<i>Claytonia perfoliata</i> Willd.	Miner's lettuce
<i>Clinopodium douglasii</i> (Benth.) Kuntze	Yerba buena
<i>Collinsia grandiflora</i> Lindl.	Giant blue eyed Mary
<i>Collinsia parviflora</i> Lindl.	Maiden blue eyed Mary
<i>Collinsia sparsiflora</i> Fisch. & C. Mey. var. <i>sparsiflora</i>	Spinster's blue eyed Mary
<i>Collinsia torreyi</i> A. Gray var. <i>torreyi</i> (S. Wats.) I.M. Johnson	Torrey's blue eyed Mary
<i>Collinsia torreyi</i> A. Gray var. <i>wrightii</i> (S. Wats.) I.M. Johnson	Wright's blue eyed Mary
<i>Collomia grandiflora</i> Lindl.	Grand collomia
<i>Corallorhiza maculata</i> Raf.	Summer coralroot
<i>Crepis pulchra</i> L.	Smallflower hawkbeard
<i>Crocidium multicaule</i> Hook.	Common spring-gold
<i>Cryptantha intermedia</i> (A. Gray) E. Greene	Clearwater cryptantha
<i>Cynoglossum grande</i> Lehm.	Pacific hound's tongue
<i>Daucus carota</i> L.	Queen Anne's lace
<i>Daucus pusillus</i> Mishx.	Wild carrot
<i>Delphinium nuttallianum</i> Pritz. ex Walp.	Twolobe larkspur
<i>Dianthus armeria</i> L. ssp. <i>armeria</i>	Deptford pink
<i>Dianthus barbatus</i> L.	Sweet William
<i>Dichelostemma congestum</i> (Sm.) Kunth	Ookow
<i>Dodecatheon hendersonii</i> A. Gray	Mosquito bills
<i>Downingia bacigalupii</i> Weiler	Bach's calicoflower
<i>Draba verna</i> L.	Spring draba
<i>Epilobium brachycarpum</i> C. Presl	Tall annual willowherb
<i>Epilobium densiflorum</i> (Lindl.) Hoch & P.H. Raven	Denseflower willowherb
<i>Epilobium minutum</i> Lindl. ex Lehm.	Chaparral willowherb

<i>Epilobium pallidum</i> (Eastw.) Hoch & P.H. Raven	Largeflower spike-primrose
<i>Equisetum arvense</i> L.	Field horsetail
<i>Eremocarpus setigerus</i> (Hook.) Benth	Dove weed
<i>Erigeron annuus</i> (L.) Pers.	Eastern daisy fleabane
<i>Erigeron philadelphicus</i> L.	Philadelphia fleabane
<i>Eriophyllum lanatum</i> (Pursh.) Forbes var. <i>integrifolium</i> (Hook.) Smiley	Common woolly sunflower
<i>Erodium cicutarium</i> L.	Redstem stork's bill
<i>Erysimum capitatum</i> (Dougl.) E. Greene	Sandune wallflower
<i>Erythronium hendersonii</i> S. Wats.	Henderson's fawnlily
<i>Fragaria vesca</i> L.	Woodland strawberry
<i>Fritillaria affinis</i> (Schult.) Sealy	Checker lily
<i>Fritillaria recurva</i> Benth.	Scarlet fritillary
<i>Galium aparine</i> L.	Stickywilly
<i>Galium divaricatum</i> Pourr. ex Lam.	Lamarck's bedstraw
<i>Galium parisiense</i> L.	Wall bedstraw
<i>Galium porrigens</i> Demps. var. <i>tenue</i> (Demps.) Demps.	Graceful bedstraw
<i>Geranium dissectum</i> L.	Cutleaf geranium
<i>Geranium oreganum</i> Howell	Oregon geranium
<i>Gilia capitata</i> Sims	Bluehead gilia
<i>Githopsis diffusa</i> A. Gray	San Gabriel bluecup
<i>Goodyera oblongifolia</i> Raf.	Western rattlesnake plantain
<i>Grindelia nana</i> Nutt.	Idaho gumweed
<i>Hemizonia congesta</i> DC. ssp. <i>clevelandii</i> (E. Greene) Bab. & H.M. Hall	Hayfield tarweed
<i>Hemizonia fitchii</i> A. Gray	Fitch's tarweed
<i>Hesperochiron pumilus</i> (Dougl. ex Griseb) Porter	Dwarf hesperochiron
<i>Hesperolinon micranthum</i> (A. Gray) Small	Smallflower dwarf-flax
<i>Hieracium albiflorum</i> Hook.	White hawkweed
<i>Hieracium greenei</i> A. Gray	Green's hawkweed
<i>Horkelia daucifolia</i> (E. Greene) Rydb.	Carrotleaf horkelia
<i>Hypericum perforatum</i> L.	Common St. Johnswort
<i>Iris chrysophylla</i> Howell	Yellowleaf iris
<i>Lactuca serriola</i> L.	Prickly lettuce
<i>Leucanthemum vulgare</i> Lam.	Oxeye daisy
<i>Lilium pardalinum</i> Kellogg ssp. <i>wigginsii</i> (Beane & Voll.) M.W. Skinner	Wiggins' lily
<i>Linanthus bicolor</i> (Nutt.) E. Greene	True babystars
<i>Linum bienne</i> Miller	Pale flax
<i>Linum usitatissimum</i> L.	Common flax
<i>Lomatium nudicaule</i> (Pursh) J.M. Coult. & Rose	Barestem biscuitroot
<i>Lithophragma parviflorum</i> Nutt. ex Torr. & A. Gray	Smallflower woodland-star
<i>Lomatium triternatum</i> (Pursh) J.M. Coult. & Rose	Nineleaf biscuitroot
<i>Lomatium utriculatum</i> (Nutt. ex Torr. & A. Gray) J.M. Coult. & Rose	Common lomatium

<i>Lotus corniculatus</i> L.	Bird's-foot trefoil
<i>Lotus unifoliolatus</i> (Hook.) Benth. var. <i>unifoliolatus</i>	American bird's-foot trefoil
<i>Lotus wrangelianus</i> Fisch. & Mey.	Chilean bird's-foot trefoil
<i>Lupinus albicaulis</i> Dougl.	Sicklekeel lupine
<i>Lupinus albifrons</i> Benth.	Silver lupine
<i>Lupinus bicolor</i> Lindl.	Miniature lupine
<i>Lupinus latifolius</i> J. Agardh. var. <i>viridiflorus</i> (A.A. Heller) C.P. Smith	Broadleaf lupine
<i>Lupinus lepidus</i> Dougl. ex Lindl.	Pacific lupine
<i>Lupinus polyphyllus</i> Lindl.	Bigleaf lupine
<i>Lythrum hyssopifolium</i> L.	Hyssop loosestrife
<i>Madia elegans</i> D. Don ex Lindley ssp. <i>elegans</i>	Common madia
<i>Madia glomerata</i> Hook.	Mountain tarweed
<i>Madia gracilis</i> (Sm.) D.D. Keck	Grassy tarweed
<i>Madia madioides</i> (Nutt.) E. Greene	Woodland madia
<i>Maianthemum racemosum</i> (L.) Link ssp. <i>racemosum</i>	Feathery false lily of the valley
<i>Microseris lacinata</i> (Hook.) Schultz-Bip.	Cutleaf silverpuffs
<i>Microsteris gracilis</i> (Hook.) Greene var. <i>gracilis</i>	Slender phlox
<i>Mimulus guttatus</i> DC.	Seep monkeyflower
<i>Minuartia californica</i> (A. Gray) Mattf.	California sandwort
<i>Minuartia douglasii</i> (Fenzl ex Torr. & A. Gray) Mattf.	Douglas' stitchwort
<i>Moehringia macrophylla</i> (Hook.) Fenzl	Largeleaf sandwort
<i>Moenchia erecta</i> (L.) P. Gaertn., Mey., & Scherb. var. <i>erecta</i>	Upright chickweed
<i>Montia linearis</i> (Dougl. ex Hook.) E. Greene	Narrowleaf minerslettuce
<i>Myosotis discolor</i> Pers.	Changing forget-me-not
<i>Myosotis laxa</i> Lehm.	Bay forget-me-not
<i>Nasturtium microphyllum</i> Boenn. ex Rchb.	Onerow yellowcress
<i>Navarretia intertexta</i> (Benth.) Hook. ssp. <i>intertexta</i>	Needleleaf navarretia
<i>Navarretia pubescens</i> (Benth.) Hook. & Arn.	Downy pincushionplant
<i>Navarretia sinstra</i> (M.E. Jones) L.A. Johnson ssp. <i>sinistra</i>	Alva Day's pincushionplant
<i>Nemophila pedunculata</i> Dougl. ex Benth.	Littlefoot nemophila
<i>Olsynium douglasii</i> (A. Dietr.) E. P. Bicknell var. <i>douglasii</i>	Douglas' glass-widow
<i>Orobanche fasciculata</i> Nutt.	Clustered broomrape
<i>Orobanche uniflora</i> L.	Oneflowered broomrape
<i>Osmorhiza berteroi</i> DC.	Sweetcicely
<i>Packera cana</i> (Hook.) W.A. Weber & A. Love	Woolly groundsel
<i>Pectocarya pusilla</i> (A. DC.) A. Gray	Little combseed
<i>Penstemon roezlii</i> Regel	Roezl's penstemon
<i>Perideridia howellii</i> (J.M. Coult. & Rose) Mathias	Howell's yampah
<i>Phacelia hastata</i> Dougl. ex Lehm. var. <i>hastata</i>	Silverleaf phacelia
<i>Piperia elegans</i> (Lindl.) Rydb.	Elegant piperia
<i>Piperia transversa</i> Suksd.	Royal rein orchid

<i>Plagiobothrys glyptocarpus</i> (Piper) I.M. Johnst.	Sculptured popcornflower
<i>Plagiobothrys nothofulvus</i> (A. Gray) A. Gray	Rusty popcornflower
<i>Plagiobothrys scouleri</i> (Hook. & Arn.) I.M. Johnst. var. <i>hispidulus</i> (Greene) Dorn	Sleeping popcornflower
<i>Plagiobothrys stipitatus</i> (E. Greene) I.M. Johnst. var. <i>micranthus</i> (Piper) I.M. Johnst.	Stalked popcornflower
<i>Plagiobothrys tenellus</i> (Nutt. ex Hook.) A. Gray	Pacific popcornflower
<i>Plantago lanceolata</i> L.	Narrowleaf plantain
<i>Plectritis congesta</i> (Lindl.) DC.	Shortspur seablush
<i>Polygonum californicum</i> Meisn.	California knotweed
<i>Polygonum douglasii</i> Greene	Douglas' knotweed
<i>Potamogeton nodosus</i> Poiret	Longleaf pondweed
<i>Potentilla drummondii</i> Lehm. ssp. <i>bruciae</i> (Rydb.) D.D. Keck	Drummond's cinquefoil
<i>Potentilla gracilis</i> Dougl. ex Hook. var. <i>gracilis</i>	Slender cinquefoil
<i>Prunella vulgaris</i> L. ssp. <i>lanceolata</i> (Bartr.) Hultén	Lance selfheal
<i>Psilocarphus oreganus</i> Nutt.	Oregon woollyheads
<i>Pterospora andromedea</i> Nutt.	Woodland pinedrops
<i>Pyrola asarifolia</i> Michx. ssp. <i>asarifolia</i>	Liverleaf wintergreen
<i>Pyrola picta</i> Smith	Whiteveined wintergreen
<i>Ranunculus aquatilis</i> L.	White water crowfoot
<i>Ranunculus arvensis</i> L.	Corn buttercup
<i>Ranunculus californicus</i> Benth.	California buttercup
<i>Ranunculus occidentalis</i> Nutt.	Western buttercup
<i>Ranunculus orthorhynchus</i> Hook.	Straightbeak buttercup
<i>Ranunculus uncinatus</i> D. Don ex G. Don	Woodland buttercup
<i>Rumex crispus</i> L.	Curly dock
<i>Sanguisorba annua</i> (Nutt. ex Hook.) Nutt. ex Torr. & A. Gray	Prairie burnet
<i>Sanicula crassicaulis</i> Poepp. ex DC.	Pacific blacksnakeroot
<i>Saxifraga californica</i> Greene	California saxifrage
<i>Saxifraga integrifolia</i> Hook.	Wholeleaf saxifrage
<i>Schoenoplectus acutus</i> (Muhl. ex Bigelow) Á. Löve & D. Löve var. <i>occidentalis</i> (S. Wats.) S.G. Sm.	Tule
<i>Scutellaria antirrhinoides</i> Benth.	Nose skullcap
<i>Senecio integerrimus</i> var. <i>exaltatus</i> (Nutt.) Cronq.	Columbia ragwort
<i>Sidalcea oregana</i> ssp. <i>spicata</i> (Regel) C. Hitchc.	Oregon checkbloom
<i>Silene campanulata</i> ssp. <i>glandulosa</i> C. Hitchc. & Mag.	Red mountain catchfly
<i>Silene hookeri</i> Nutt.	Hooker's silene
<i>Silene noctiflora</i> L.	Nightflowering silene
<i>Sisyrinchium bellum</i> S. Wats.	Western blue-eyed grass
<i>Stachys ajugoides</i> Benth.	Bugle hedgenettle
<i>Stachys rigida</i> Nutt. ex Benth. var. <i>rigida</i>	Rough hedgenettle
<i>Tonella tenella</i> (Benth.) A.A. Heller	Lesser baby innocence
<i>Torilis arvensis</i> (Hudson) Link	Hedgeparsley

<i>Torilis nodosa</i> (L.) Gaertn.	Knotted hedgeparsley
<i>Tragopogon dubius</i> Scop.	Yellow salsify
<i>Trichostema lanceolatum</i> Benth.	Vinegarweed
<i>Trientalis borealis</i> Raf. ssp. <i>latifolia</i> (Hook.) Hultén	Broadleaf starflower
<i>Trifolium bifidum</i> A. Gray	Notchleaf clover
<i>Trifolium dichotomum</i> Hook. & Arn.	Branched Indian clover
<i>Trifolium dubium</i> Sibth.	Suckling clover
<i>Trifolium siskiyouense</i> J.M. Gillett	Siskiyou clover
<i>Trifolium willdenovii</i> Spreng.	Tomcat clover
<i>Trillium albidum</i> Freem.	Giant white wakerobin
<i>Triteleia bridgesii</i> (S. Wats.) E. Greene	Bridge's brodiaea
<i>Triteleia hyacinthina</i> (Lindl.) E. Greene	White brodiaea
<i>Vancouveria hexandra</i> (Hook.) Morren & Decne	White inside-out flower
<i>Verbascum blattaria</i> L.	Moth mullein
<i>Veronica americana</i> (Raf.) Schwein.	American speedwell
<i>Veronica arvensis</i> L.	Corn speedwell
<i>Vicia americana</i> Muhl. ex Willd. ssp. <i>americana</i>	American vetch
<i>Vicia sativa</i> L. ssp. <i>sativa</i>	Garden vetch
<i>Viola glabella</i> Nutt.	Pioneer violet
<i>Viola purpurea</i> Kellogg ssp. <i>quercetorum</i> (M.S. Baker & J.C. Clausen) R.J. Little	Goosefoot violet
<i>Viola sheltonii</i> Torr.	Shelton's violet
<i>Wyethia angustifolia</i> (DC.) Nutt.	California compassplant
<i>Zigadenus venenosus</i> S. Wats. var. <i>venosus</i>	Meadow deathcamas

Grasses, rushes, and sedges:

<i>Achnatherum lemmonii</i> (Vasey) Barkw.	Lemmon's needlegrass
<i>Aira caryophyllea</i> L.	Silver hairgrass
<i>Avena fatua</i> L.	Wild oat
<i>Briza minor</i> L.	Little quakinggrass
<i>Bromus carinatus</i> Hook. & Arn. var. <i>carinatus</i>	California brome
<i>Bromus hordeaceus</i> L.	Soft brome
<i>Bromus tectorum</i> L.	Cheatgrass
<i>Carex multicaulis</i> L. Bailey	Manystem sedge
<i>Carex stipata</i> Muhlenb. var. <i>stipata</i>	Awlfruit sedge
<i>Cynosurus echinatus</i> L.	Hedgehog dogtail
<i>Danthonia californica</i> Bol.	California oatgrass
<i>Deschampsia cespitosa</i> (L.) P. Beauv.	Tufted hairgrass
<i>Deschampsia danthonioides</i> (Trin.) Munro	Annual hairgrass
<i>Deschampsia elongata</i> (Hook.) Munro	Slender hairgrass
<i>Elymus elymoides</i> (Raf.) Swezey	Squirreltail
<i>Elymus elymoides</i> (Raf.) Swezey ssp. <i>brevifolius</i> (Sm.) Barkw.	Squirreltail
<i>Elymus elymoides</i> (Raf.) Swezey ssp. <i>hordeoides</i> (Suksd.) Barkw.	Squirreltail

<i>Elymus glaucus</i> Buckl. ssp. <i>glaucus</i>	Blue wildrye
<i>Festuca californica</i> Vasey	California fescue
<i>Festuca occidentalis</i> Hook.	Western fescue
<i>Festuca roemerii</i> (Pavlick) E.B. Alexeev	Roemer's fescue
<i>Festuca viridula</i> Vasey	Greenleaf fescue
<i>Gastridium phleoides</i> (Nees & Meyen) C.E. Hubbard	Nit grass
<i>Hordeum jubatum</i> L.	Foxtail barley
<i>Juncus brachyphyllus</i> Wieg.	Tuftedstem rush
<i>Juncus bufonius</i> L. var. <i>bufonius</i>	Toad rush
<i>Juncus effusus</i> L. var. <i>exiguus</i> Fern. & Wieg.	Lamp rush
<i>Juncus tenuis</i> Willd.	Poverty rush
<i>Koeleria macrantha</i> (Ledeb.) J.A. Schultes	Prairie Junegrass
<i>Luzula comosa</i> E. Mey.	Pacific woodrush
<i>Melica subulata</i> (Gris.) Scribn.	Alaska oniongrass
<i>Phleum pratense</i> L.	Timothy
<i>Poa pratensis</i> L.	Kentucky bluegrass
<i>Poa secunda</i> J. Presl	Sandberg bluegrass
<i>Pseudoroegneria spicata</i> (Pursh) Á. Löve	Bluebunch wheatgrass
<i>Schoenoplectus acutus</i> (Muhl. ex Bigel.) Á. Löve & D. Löve var. <i>occidentalis</i> (S. Wats.) S.G. Sm.	Tule
<i>Scribneria bolanderi</i> (Thurb.) Hack.	Scribner's grass
<i>Taeniatherum caput-medusae</i> (L.) Nevski	Medusahead
<i>Thinopyrum ponticum</i> (Podp.) Z.-W. Liu & R.-C. Wang	Tall wheatgrass
<i>Vulpia microstachys</i> (Nutt.) Munro var. <i>microstachys</i>	Desert fescue

<sup>1</sup> Nomenclature for vascular plants, ferns, and fern-allies follows the Flora of North America (1993+), and the Oregon Flora Project (Cook and Sundberg 2013). Common names are taken from the U.S. Department of Agriculture, Natural Resource Conservation Service—Plants Database web site: <http://plants.usda.gov/>.

<sup>2</sup> Compiled from field observations of Schuller et al. (2012), Kagan (2012), and Wineteer (2001).

## Appendix 2: Amphibians, Reptiles, Birds, and Mammals<sup>1 2 3</sup>

Family	Scientific name	Common name
Amphibians:		
Salamandridae	<i>Taricha granulosa</i>	Roughskin newt
Hylidae	<i>Pseudacris regilla</i>	Pacific chorus frog
Ranidae	<i>Rana boylei</i>	Foothill yellow-legged frog
	<i>Rana catesbeiana</i>	Bullfrog
Reptiles:		
Emydidae	<i>Actinemys marmorata</i>	Northwestern pond turtle
Anguillidae	<i>Elgaria coerulea</i>	Northern alligator lizard
	<i>Elgaria multicarinata</i>	Southern alligator lizard
	<i>Eumeces skiltonianus</i>	Western skink
Scincidae	<i>Eumeces skiltonianus</i>	Western skink
Colubridae	<i>Pituophis catenifer</i>	Gopher snake
	<i>Thamnophis sirtalis</i>	Common garter snake
Iguanidae	<i>Sceloporus occidentalis</i>	Western fence lizard
Viperidae	<i>Crotalus oreganus</i>	Northern Pacific rattlesnake
Birds:		
Ardeidae	<i>Ardea herodias</i>	Great blue heron
Cathartidae	<i>Cathartes aura</i>	Turkey vulture
Accipitridae	<i>Accipiter gentilis</i>	Northern goshawk
	<i>Accipiter striatus</i>	Sharp-shinned hawk
	<i>Accipiter cooperii</i>	Cooper's hawk
	<i>Buteo jamaicensis</i>	Red-tailed hawk
	<i>Falco sparverius</i>	American kestrel
Falconidae	<i>Falco sparverius</i>	American kestrel
Phasianidae	<i>Bonasa umbellus</i>	Ruffed grouse
	<i>Callipepla californica</i>	California quail
	<i>Meleagris gallopavo</i>	Wild turkey
	<i>Oreortyx pictus</i>	Mountain quail
Columbidae	<i>Columba fasciata</i>	Band-tailed pigeon
	<i>Zenaidura macroura</i>	Mourning dove
Strigidae	<i>Strix nebulosa</i>	Great gray owl
	<i>Strix occidentalis</i>	Spotted owl
	<i>Strix varia</i>	Barred owl
Trochilidae	<i>Selasphorus rufus</i>	Rufous hummingbird
Alcedinidae	<i>Ceryle alcyon</i>	Belted kingfisher
Picidae	<i>Colaptes auratus</i>	Northern flicker
	<i>Dryocopus pileatus</i>	Pileated woodpecker
	<i>Melanerpes lewis</i>	Lewis' woodpecker
	<i>Picoides villosus</i>	Hairy woodpecker
	<i>Sphyrapicus nuchalis</i>	Red-naped sapsucker

Tyrannidae	<i>Contopus borealis</i>	Olive-sided flycatcher
	<i>Empidonax hammondii</i>	Hammond's flycatcher
	<i>Empidonax traillii</i>	Willow flycatcher
	<i>Empidonax difficilis</i>	Pacific-slope flycatcher
Corvidae	<i>Aphelocoma coerulescens</i>	Western scrub jay
	<i>Corvus corax</i>	Common raven
	<i>Cyanocitta stelleri</i>	Steller's jay
Paridae	<i>Baeolophus inornatus</i>	Oak titmouse
	<i>Poecile atricapilla</i>	Black-capped chickadee
	<i>Poecile gambeli</i>	Mountain chickadee
Sittidae	<i>Sitta caroliniensis</i>	White-breasted nuthatch
Certhiidae	<i>Certhia americana</i>	Brown creeper
Troglodytidae	<i>Troglodytes aedon</i>	House wren
Muscicapidae	<i>Sialia mexicana</i>	Western bluebird
	<i>Turdus migratorius</i>	American robin
Vireonidae	<i>Vireo cassinii</i>	Cassin's vireo
Emberizidae	<i>Ammodramus savannarum</i>	Grasshopper sparrow
	<i>Icterus bullockii</i>	Bullock's oriole
	<i>Junco hyemalis</i>	Dark-eyed junco
	<i>Melospiza melodia</i>	Song sparrow
	<i>Passerina amoena</i>	Lazuli bunting
	<i>Pheucticus melanocephalus</i>	Black-headed grosbeak
	<i>Pipilo maculatus</i>	Spotted towhee
	<i>Piranga ludoviciana</i>	Western tanager
	<i>Spizella passerina</i>	Chipping sparrow
	<i>Vermivora ruficapilla</i>	Nashville warbler
	Fringillidae	<i>Carduelis psaltria</i>
Mammals:		
Vespertilionidae	<i>Antrozous pallidus</i>	Pallid bat
	<i>Corynorhinus townsendii</i>	Townsend's big-eared bat
Sciuridae	<i>Sciurus griseus</i>	Western gray squirrel
Canidae	<i>Canis latrans</i>	Coyote
Felidae	<i>Felis concolor</i>	Mountain lion
Cervidae	<i>Cervus elaphus</i>	Elk
	<i>Odocoileus hemionus</i> ssp. <i>columbianus</i>	Black-tailed deer

<sup>1</sup> Compiled from field observations (Kagan, 2010, Wineteer 2001), and from habitat descriptions and distribution maps in: Csuti et al. 1997. Atlas of Oregon wildlife. Corvallis, OR: Oregon State University Press. 492 p. + map.

<sup>2</sup> Nomenclature taken from Csuti et al. 1997. Atlas of Oregon wildlife. Corvallis, OR: Oregon State University Press. 492 p. + map.

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

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