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Horse Rock Ridge Research Natural Area

Guidebook Supplement 27

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Abstract

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Horse Rock Ridge Research Natural Area (HRR RNA) was established in June 1995 to protect the best remaining example of a grassy "bald" (treeless area) on the western margin of the Cascade Range and its associated botanical, wildlife, and scenic values. This bald is surrounded by old-growth *Pseudotsuga menziesii*/*Tsuga heterophylla* (Douglas-fir/western hemlock) forest in the Coburg Hills on the eastern edge of the Willamette Valley in western Oregon. The site is recognized for its considerable diversity of plant species that includes both Willamette Valley plants as well as plants more often found in the montane zone of the Cascade Range. There are also several species present at the site that are normally found east of the Cascade Range. This guidebook describes the area, environment, biota, disturbance history, research, and access.

Keywords: Research natural area, vegetation types, vascular plants, lichens, liverworts, mosses, birds, mammals, mollusks, amphibians, reptiles.

Introduction

Horse Rock Ridge Research Natural Area (HRR RNA) was established in June 1995 to protect the best remaining example of a grassy “bald” (treeless area) on the western margin of the Cascade Range and its associated botanical, wildlife, and scenic values (fig. 1). The bald is surrounded by old-growth *Pseudotsuga menziesii*/*Tsuga heterophylla* forest in the Coburg Hills on the eastern edge of the Willamette Valley in western Oregon. The site is recognized for its considerable diversity of plant species that includes both Willamette Valley plants as well as plants more often found in the montane zone of the Cascade Range (Oregon Natural Heritage Advisory Council 1993).¹ There are also several species present at the site that are normally found east of the Cascade Range.

There are two primary communities at this RNA—grassland and forest. Within each of these communities, there are a number of plant associations:

- Grasslands occupy the open, south-facing slopes at HRR, usually occurring in areas with soils shallower than the soil in forested areas. The grassland community consists of three distinct plant associations: *Elymus glaucus* (blue wildrye) association; *Festuca idahoensis* (Idaho fescue) association; and *Stipa lemmonii*/*Racomitrium canescens* (Lemmon’s needlegrass/moss) associations.
- The forest community is classed as a *Pseudotsuga menziesii*/*Tsuga heterophylla* (Douglas-fir/western hemlock) association with an understory dominated by small *Berberis nervosa* (Cascade Oregon grape), *Gaultheria shallon* (salal), and *Symphoricarpos albus* (snowberry). The forest occurs on the deepest soils within the natural area (Vander Schaaf 1993).

This 153-ha (378-acre) area is located in Linn County, Oregon (fig. 2), and is administered by the McKenzie Resource Area of the Eugene District, Bureau of Land Management (BLM). The RNA is situated in section 1, T. 15 S., R. 2 W., Willamette Meridian (44°18’ N. latitude and 122°52’ W. longitude).

Access and Accommodations

To reach the RNA, take U.S. Interstate 5 to Springfield exit 194A. Drive east on Interstate 105 (Oregon state Highway 126) 4.0 mi (6.4 km) to the Marcola exit. Travel north on Marcola Road 0.9 mi (1.4 km), cross the McKenzie River, drive 9.8 mi (15.8 km) to the town of Marcola, and continue northward 3.4 mi (5.5 km) to Shotgun Creek Road BLM 16-1-5. Turn onto this road and drive 3.5 mi (5.6 km) to the Seeley Creek Road BLM 15-1-19.1. Turn onto this road and drive 2.5 mi (4.0 km) and continue on BLM road 15-1-18.2 for 1.5 mi (2.4 km) to a gravel stockpile on the west side of the road. All roads to this point are paved. Park here and proceed on foot northward along the main road 0.1 mi (0.2 km) to BLM road 15-2-1 (closed to all vehicles) and follow it through young timber for 0.6 mi (1.0 km) to the open grasslands.

Or, take Interstate 5 to the Brownsville exit 216. Drive east on Oregon state Highway 228 to Crawfordsville. Just east of this town, turn south on Brush Creek County Road 1900 and drive 2.0 mi (3.2 km) to its intersection with West Fork Brush Creek Road, BLM 14-1-32. Turn onto this road and drive 2.5 mi (4.0 km) and continue on BLM road 15-1-18.2 for 1.0 mi (1.6 km) to a gravel stockpile on the west side of the road. All roads to this point are paved. Park here and proceed on foot northward along the main road 0.1 mi (0.2 km) to BLM road 15-2-1 (closed to all vehicles) and follow it through young timber for 0.6 mi (1.0 km) to the open grasslands.

¹ See appendix for species list.



Figure 1—View northwest toward the summit of Horse Rock Ridge Research Natural Area showing open, south-facing slopes.

Commercial accommodations are available in the Springfield-Eugene metropolitan area and in Brownsville. Commercial air, rail, and bus service is available in Eugene.

Environment

Horse Rock Ridge RNA is located in the Coburg Hills on the divide between the Calapooya and Mohawk River drainages in western Oregon. It lies east of the Willamette Valley and is part of the western slope of the Cascade Range physiographic province. Approximately two-thirds of the RNA has a southern exposure, and the rest of the area lies on a north slope. The topography is rugged with rock outcroppings and steep slopes. The RNA consists of a mosaic of open grasslands, young-growth forest (on areas previously logged), and old-growth forest. The elevation of the RNA ranges from 472 to 873 m (1,550 to 2,864 ft).

The Pacific Ocean, 61 mi (98 km) west of the RNA, gives the area a temperate marine climate—cool, wet winters and warm, dry summers. The RNA lies nearly equidistant between the weather stations at the Eugene airport (to the southwest) and at Foster Dam (to the northeast). Both stations are at elevations much lower than the RNA, with the Eugene airport at an elevation of 109 m (359 ft). Yearly mean precipitation recorded at the Eugene airport for the years 1961 through 1990 was 194 cm (49 in), and at Foster Dam was 209 cm (53 in) (Oregon State University 2001). As the elevation of the RNA is some 600 m (2,000 ft) higher than these two weather stations, precipitation is likely to be considerably more at the RNA. About 70 percent of the precipitation falls from November through March, and only 5 percent from June through August. Most of this is rain, although snow may cover the ground for a few days to a couple of weeks or, rarely, more each year.

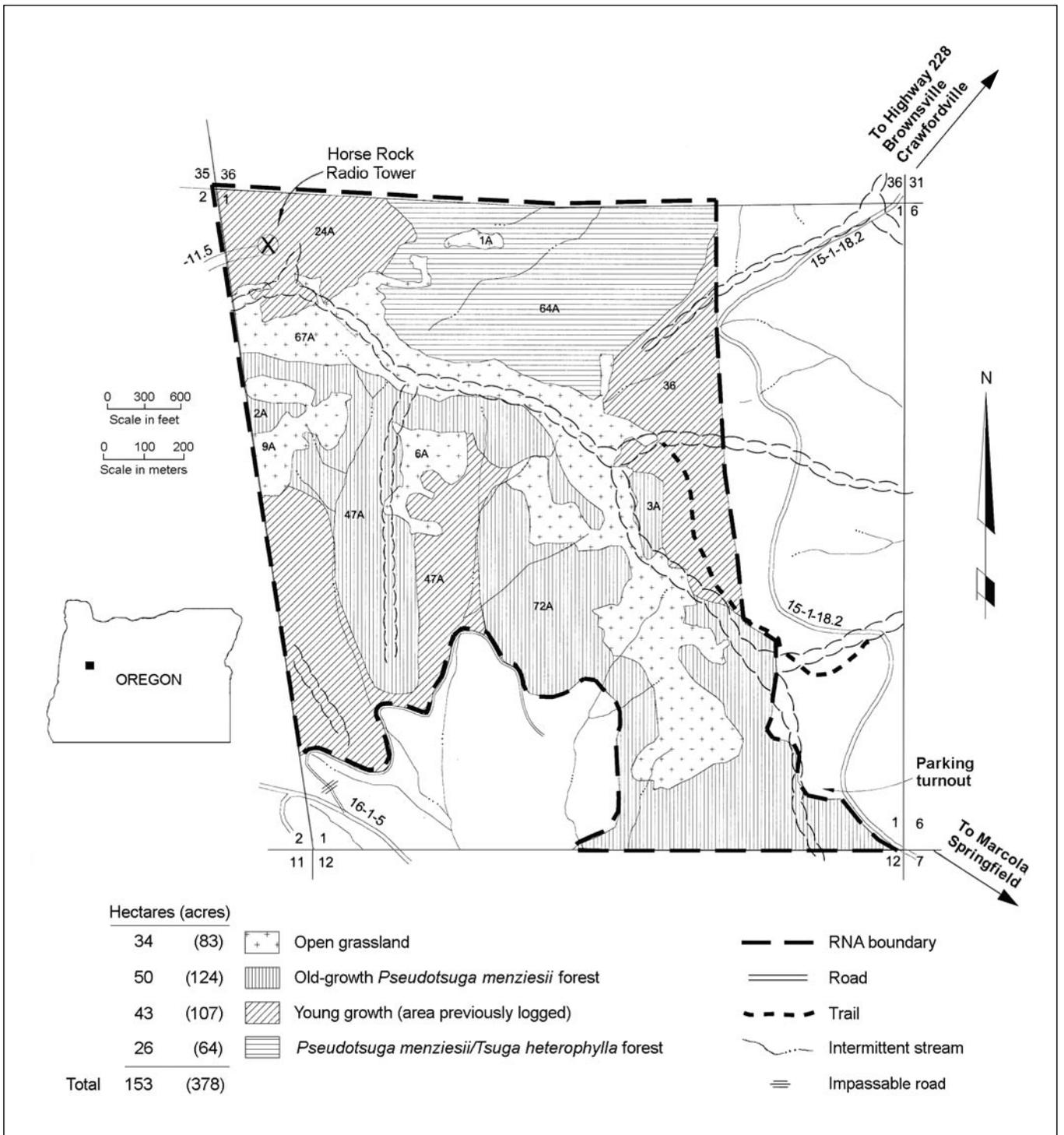


Figure 2—Horse Rock Ridge Research Natural Area.

At the Eugene airport, temperatures average 3.8 °C (40 °F) in January and 19.4 °C (67 °F) in July, and the mean annual temperature is 11.1 °C (52 °F). The mean annual temperature at Foster Dam is the same as at the Eugene airport. In summer, the relative humidity at Eugene is usually between 35 and 50 percent, but it occasionally drops below 30 percent. Evaporation at this time far exceeds precipitation and leads to drought.

Stable high-pressure summer airmasses bring clear skies and light winds from the north. In summer and fall, temperature inversions sometimes occur in the Willamette Valley and adjacent areas. In late fall, winter, and spring, unstable low-pressure airmasses bring frequent storms from the Pacific Ocean. Prevailing winds are out of the southwest, and their force sometimes causes extensive windthrow of trees. Wind-speeds of 63 mi per hour (101 km per hour) were recorded at the Eugene airport during the Columbus Day storm in 1962. Large trees that were wind-thrown by this storm can still be seen along the forest/grassland interface in the RNA (fig. 3).

Geology²

The predominant bedrock at HRR is a series of basalt and basaltic andesite flows. These volcanic rocks were deposited during the Oligocene and early Miocene epochs about 24 million years ago. The rocks are extrusive, formed by rapid cooling of molten lava at the surface. The rocks found at HRR have a prevalent “amygdaloidal texture.” When the lava flows cooled, dissolved gasses in the molten rock were trapped in cavities called vesicles. These voids in the rock were filled with other minerals that precipitated from water circulating in the rock just before, or at some time after, consolidation. These other minerals that filled the voids are known as amygdales. At HRR the amygdales are zeolites and quartz, white in color, and round in shape. As the basaltic rocks erode, the zeolite and quartz amygdales break off, and small specimens can be found on the surface of the rock outcrops throughout the area.

Sometime after the lava flows were formed, a nearly vertical crack, or series of cracks developed. The fissure cut steeply across the older flow layers and filled with molten lava to form a dike. This dike is a prominent outcropping of fine-grained basalt that was fractured during the natural cooling process. Owing to its fine-grained texture, the dike is more resistant to erosion, as compared to the amygdaloidal basalt flows. Sections of the dike consist of horizontal columnar jointing. The dike, which is more than 100 meters long, is clearly visible in the grasslands area of the RNA (fig. 4).

Soils³

Soils in the grassland areas are a complex of rock outcrop (60 percent) and Entisols (30 percent). Slopes are typically 55 to 70 percent. These soils exhibit little or no development. Entisols typically occur on young landscapes where the soil material has not been in place long enough for soil processes to form diagnostic horizons (fig. 5). This is the case at HRR where the basalt is very resistant and slopes are steep and actively eroding. Horizontal orientation of the basalt flows also may contribute to the fact that water is readily shed from the site as runoff and is not available for soil formation. Soils here are generally well drained and have loamy or sandy loam textures. Depth is highly variable: 18 cm near exposed bedrock, 36 cm in depositional areas

² Ward, K.; Wiedenbeck, R.; Baitis, K. 2001. Personal communication. Hydrologist, and soil scientists, respectively. USDI Bureau of Land Management, P.O. Box 10226, Eugene, OR 97440-2226.

³ References used: USDA NRCS 1999, USDA SCS 1987.

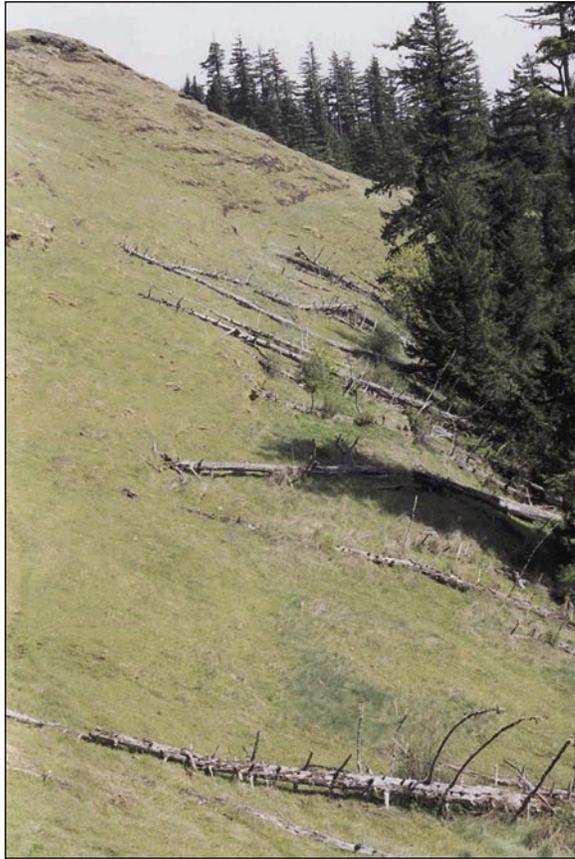


Figure 3—Herbaceous plants cover the steep south-facing slopes of the research natural area. The row of wind-thrown trees at the base of the slope dates from a 1962 windstorm.



Figure 4—The basaltic dike extends from the ridgetop in a southeast direction for more than 100 meters down the slope.



Figure 5—View of basaltic outcrops and shallow Entisols soils.

near drainages, and as deep as 91 cm on the less severe slopes along the main ridgetop where some old-growth *Pseudotsuga menziesii* occurs. Content of gravel and cobble also differs greatly.

Soils in forested portions of the RNA are primarily the Kinney series. These soils are deep and well drained. They formed in colluvium derived dominantly from undifferentiated tuffaceous rock. The soil surface is a cobbly loam about 38 cm thick. The subsoil is a cobbly clay loam about 51 cm thick. Average depth to bedrock is 1.4 m. Many slope phases of Kinney soils are mapped within the RNA, with the largest area occurring on steep (50 to 70 percent) upper slopes. Lower slopes are more moderate (20 to 50 percent). Kinney is a very productive forest soil. Site index is 180 for *Pseudotsuga menziesii* and 140 for *Tsuga heterophylla*, based on height growth over 100 years.

Hydrology⁴

There are several small (roughly ½- to 1-m square) seasonal springs near the ridgetop in the RNA. Although they dry up completely in summer, they support small populations of wetland plants and flow during storm events. Many ephemeral stream channels are found on the lower reaches of the grasslands. These are eroded to bedrock owing to the thin, fragile soil found there, and the channels are typically about 30 cm across (fig. 6).

Lower slopes in the RNA are dissected by several stream channels, but they flow only during late fall, winter, and spring when storms bring adequate moisture from the Pacific Ocean.

Vegetation

Horse Rock Ridge RNA is noted for its diversity of plant communities and species. The checklist of vascular plants for the site includes more than 230 species. None of the plants at this site are federally listed as threatened or endangered.

⁴Ward, K.; Wiedenbeck, R. 2001. Personal communication. Hydrologist and soil scientist, respectively. USDI Bureau of Land Management, P.O. Box 10226, Eugene, OR 97440-2226.



Figure 6—Dry ephemeral stream channel on the upper slope of the research natural area, August 2001.

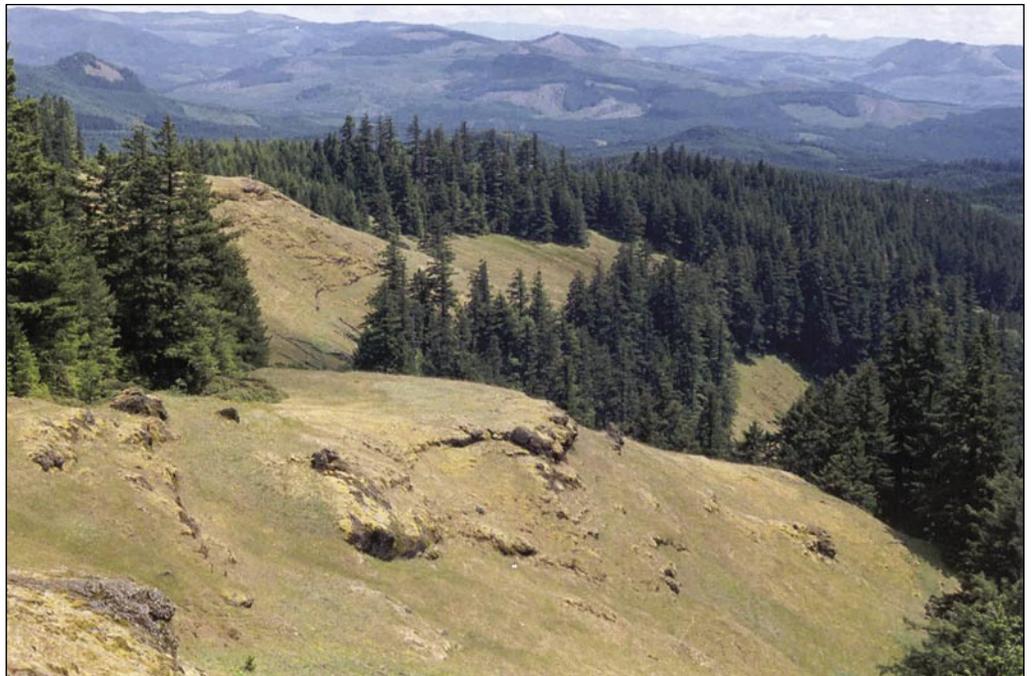


Figure 7—View southeast from the upper slopes of the research natural area.

Grasslands

The grass bald at this RNA is one of the largest on the western slope of the Cascade Range and covers 34 ha (83 acres). Outstanding areas of undisturbed grassland occupy south-facing slopes where there has been no grazing by domestic animals for many decades. The upper slopes receive intense solar radiation and dry out by midsummer (fig. 7).

The grasslands at HRR contain a greater diversity of species than other similar sites on the western slope of the Cascade Range. Many wildflowers are found here, including *Blepharipappus scaber* and *Balsamorhiza deltoidea*, which are more typical of central and eastern Oregon grasslands.

Within the grassland community, there exists a mosaic of plant associations.

The *Festuca idahoensis* association is notable as it is unusual in western Oregon although it is common in arid areas of eastern Oregon and throughout the intermountain West. This association occupies the deepest soils in the grasslands area of the RNA. These sites are often concave and appear to be moister than surrounding areas. The soils may comprise considerable colluvium that has resulted from upslope slumping and soil creep. This association is less weedy and occupies less overall area than the *Elymus glaucus* association.

The *Elymus glaucus* association is the most prominent on the grasslands at HRR. It occurs on convex slopes with moderate soil depths. This association typifies grassy balds on the western slope of the Cascade Range and higher elevations of the Willamette Valley that have not been lost through heavy livestock grazing and invasion by weedy annual grasses and aggressive exotic plants.

The *Stipa lemmonii/Racomitrium canescens* association occurs on slopes over a gravel substrate where there is little or no appreciable soil formation. There are fewer weeds found here as compared to the other grassland associations noted above. A variant of this association is found directly on rock outcrops where *Eriogonum nudum* is prominent in small sites.

There are a few vernal seeps below the ridgeline on the south slope of the RNA. Within the immediate vicinity of the seeps are areas dominated by algal mats and *Carex rossii* with *Mimulus guttatus* of common occurrence. *Juncus kelloggii* also grows there, a species rare in Oregon. This *Mimulus-Juncus* association has surface water present during part of the growing season.

Forest

The forest area at this RNA surrounds the grassland community (fig. 8). Common shrubs that occur in the transition area are *Arctostaphylos columbiana*, *Rhus diversiloba*, *Holodiscus discolor*, and *Amelanchier alnifolia*. Scattered trees occurring in the transition area include *Arbutus menziesii* and *Quercus garryana*.

The forest community is part of the *Pseudotsuga menziesii/Tsuga heterophylla* association with an understory dominated by several species of shrubs including *Berberis nervosa*, *Gaultheria shallon*, and *Symphoricarpos albus* (Franklin and Dyness 1973). This old-growth forest is found on the deepest soils, located mostly along the ridgetop, on the northern and eastern faces of the RNA, and along the lower slopes of the site on the south side.

The *Pseudotsuga menziesii/Tsuga heterophylla* association covers 50 ha (124 acres) and is found on north- and northeast-facing slopes, whereas on other exposures, the old-growth forest is mainly composed of *Pseudotsuga menziesii* and covers 30 ha (64

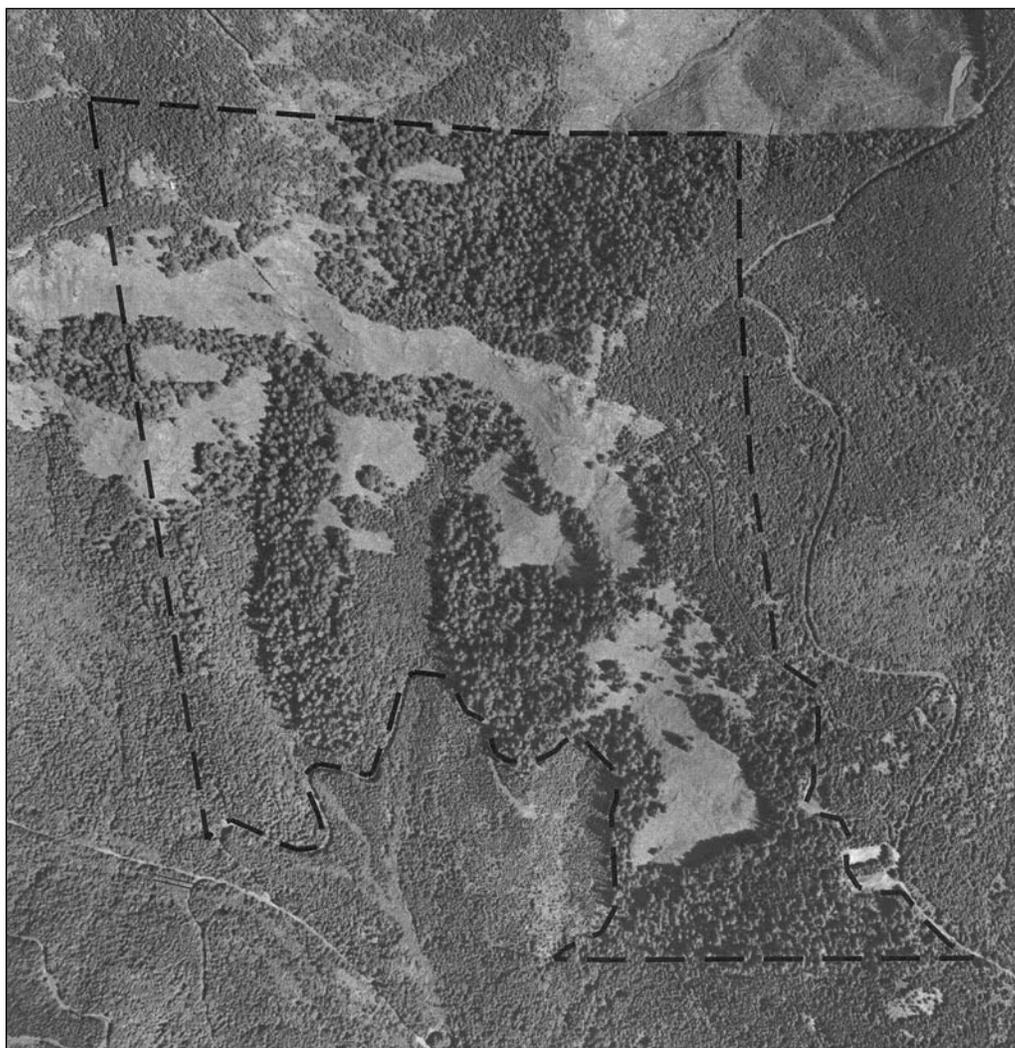


Figure 8—Aerial photo showing the mosaic of grasslands and forests of Horse Rock Ridge Research Natural Area.

acres). On the best sites, old-growth *Pseudotsuga menziesii* grows to 46 m (150 ft) in height with diameters up to 236 cm (5 ft) at breast height. These trees may be 300 years old. On north-facing slopes, associated tree species include *Tsuga heterophylla* and *Thuja plicata*, both shade-tolerant, understory species. *Acer macrophyllum* is the most common broadleaf tree. *Polystichum munitum* is a very common component of the herbaceous community. There are large snags as well as wind-thrown trees scattered throughout. Areas that were clearcut in the past were planted with *Pseudotsuga menziesii* and now comprise a densely stocked new forest covering 43 ha (107 acres) with trees up to 20 cm (8 in) in diameter and 20-plus years old.

See appendix tables 1, 2, and 3 for lists of vascular plants, lichens, and bryophytes—liverworts and mosses—in the RNA.

Fauna

Horse Rock Ridge is a diverse area for wildlife owing to the various vegetative and cover types found there. The variety of habitats, elevations, soils, rock outcrops, seasonably available water, and wildlife foods and the inaccessibility by humans attract wildlife. A list of birds believed to frequent the RNA is given in appendix table 4; mammals are listed in appendix table 5; and mollusks, amphibians, and reptiles are listed in appendix table 6.

History of Disturbance

With settlement of the nearby Willamette Valley in the middle 1850s, people introduced farming and domestic animals to the area. The HRR area was likely grazed by sheep in the early 1900s. Their hooves helped to create bare ground that permitted erosion to occur on the steep slopes and provided a seedbed for introduced weeds. It is not known how severe the grazing was or how many years it may have lasted. It is known that no grazing has occurred since the early 1960s. Thirty-four introduced plants are now established at HRR (see app. table 1). Most of these species occur in small populations within the open areas or surrounding forest. One species, *Senecio jacobaea*, tansy ragwort, is considered a noxious plant.

Land ownership in much of western Oregon is a checkerboard of private and public lands. In the early 1900s, timber companies began to harvest trees and built railroads, and later roads, to transport the logs to the mills. All of the original forest has been removed from private lands surrounding HRR, and the only old growth remains on a portion of the RNA. The surrounding area is now well roaded, and most of the land, regardless of ownership, is valuable commercial forest and is covered by healthy trees.

The Columbus Day (October 1962) windstorm caused extensive blowdown of timber throughout western Oregon. Exposed trees along the edges of open slopes at HRR were wind-thrown (see fig. 3). Later, a salvage timber sale was held to remove the downed timber where the topography permitted. On steeper slopes, trees were not salvaged, and remnants of many large trees felled by the wind can be seen protruding into the grasslands on the southern edge of the grassland/forest boundary. The BLM also has harvested timber as recently as 1980 in section 1 adjacent to the area that is now designated as the RNA. This clearcut area was broadcast burned and planted with Douglas-fir seedlings.

With human population increasing in the southern Willamette Valley, all forest lands are being actively sought out for recreation purposes. To protect the open grassland at the RNA, rock berms have been constructed across several old logging roads within section 1, and a locked gate has been placed on the access road to a radio tower that is located at the very highest point within the RNA. This has reduced damage from vehicles and bikes on the open areas. Occasional hikers have worn a trail into the vegetation on the upper slopes. Since the 1970s, students have made botany field trips to the area. Hunters use the area in autumn.

There is no evidence of wildfire having burned through the RNA. There has been no mining activity on the area.

Research

In 2000, the BLM established transects in the RNA to characterize existing vegetation and to monitor long-term vegetation changes in the grassland, forest, and the ecotone between them. These permanent sample plots will be revisited in the future. Another study monitors forest vegetation to determine air quality by chemical analysis of lichens growing in the area.

The RNA is suited to the study of succession of plant communities, wildlife use of midelevation dry grassland and adjacent forest, soil erosion, and forest growth.

Maps and Aerial Photographs

The topographic map applicable to the RNA is the 15' Marcola, Oregon, quadrangle, scale 1:62,500, issued by the U.S. Geological Survey in 1950. The BLM, Eugene District Office, can supply information on the most recent aerial photographs and forest type maps for the area. Older aerial photos are available for reference at the University of Oregon library map room. For geologic information, consult the reconnaissance geologic map and sections of the western Cascade Range, Oregon, north of latitude 43° N. (Peck et al. 1964).

Metric and English Equivalents

1 millimeter (mm) = 0.04 inch (in)

1 centimeter (cm) = 0.4 inch (in)

1 meter (m) = 3.3 feet (ft)

1 kilometer (km) = 0.6 mile (mi)

1 hectare (ha) = 2.47 acres

Degrees Celsius (°C) = (degrees Fahrenheit - 32)/1.8

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Appendix

Table 1—Vascular plants found at Horse Rock Ridge Research Natural Area^a

Scientific name ^b	Common name
<i>Acer circinatum</i> Pursh	Vine maple
<i>Acer glabrum</i> Torr. var. <i>douglasii</i> (Hook.) Dippel	Douglas maple
<i>Acer macrophyllum</i> Pursh	Bigleaf maple
<i>Achillea millefolium</i> L.	Common yarrow
<i>Achlys triphylla</i> (Smith) DC.	Vanillaleaf
<i>Adenocaulon bicolor</i> Hook.	Pathfinder
<i>Adiantum pedatum</i> L.	Maidenhair fern
<i>Agrostis exarata</i> Trin. var. <i>monolepis</i> (Torr.) Hitch.	Spike bentgrass
<i>Agrostis tenuis</i> Sibth. ^c	Colonial bentgrass
<i>Aira caryophyllea</i> L. ^c	Silver hairgrass
<i>Aira praecox</i> L. ^c	Early hairgrass
<i>Allium acuminatum</i> Hook.	Tapertip onion
<i>Allium amplexans</i> Torr.	Slimleaf onion
<i>Allium crenulatum</i> Wieg.	Scalloped onion
<i>Alnus rubra</i> Bong.	Red alder
<i>Amelanchier alnifolia</i> Nutt.	Western serviceberry
<i>Anemone deltoidea</i> Hook.	Threelobed anemone
<i>Apocynum androsaemifolium</i> L.	Spreading dogbane
<i>Aquilegia formosa</i> Fisch.	Sitka columbine
<i>Arabis glabra</i> L. Bernh.	Towermustard
<i>Arbutus menziesii</i> Pursh	Pacific madrone
<i>Arctostaphylos columbiana</i> Piper	Bristly manzanita
<i>Arenaria macrophylla</i> Hook.	Bigleaf sandwort
<i>Arenaria serphillifolia</i> L.	Thyme-leaf sandwort
<i>Arenaria stricta</i> Michx.	Slender sandwort
<i>Aspidotis densa</i> (Brackenr.) Lellinger	Aspidotis
<i>Athyrium filix-femina</i> (L.) Roth	Lady-fern
<i>Athysanus pusillus</i> (Hook.) Greene	Sandweed
<i>Balsamorhiza deltoidea</i> Nutt.	Deltoid balsamroot
<i>Barbarea orthoceras</i> Ledeb.	American wintercress
<i>Berberis aquifolium</i> Pursh	Tall Oregongrape
<i>Berberis nervosa</i> Pursh	Cascade Oregongrape
<i>Blepharipappus scaber</i> Hook.	Blepharipappus
<i>Brassica campestris</i> L. ^c	Field mustard
<i>Brodiaea congesta</i> Smith	Field cluster lily or ookow
<i>Brodiaea coronaria</i> (Salisb.) Engl.	Harvest brodiaea
<i>Brodiaea hyacinthina</i> (Lindl.) Baker	Hyacinth brodiaea
<i>Bromus mollis</i> L. ^c	Soft brome
<i>Bromus orcuttianus</i> Vasey	Orcutt brome
<i>Bromus pacificus</i> Shear	Pacific brome
<i>Bromus rigidus</i> Roth ^c	Ripgut
<i>Callitriche heterophylla</i> var. <i>bolanderi</i> (Hegelm.) Fassett	Water-starwort
<i>Callitriche verna</i> L.	Spring water-starwort
<i>Calocedrus</i> (syn. <i>Libocedrus</i>) <i>decurrens</i> (Torr.) Florin	Incense-cedar
<i>Calochortus tolmiei</i> H. & A.	Cats-ear or Tolmie's mariposa
<i>Calypso bulbosa</i> (L.) Oakes	Calypso orchid

Table 1—Vascular plants found at Horse Rock Ridge Research Natural Area^a (continued)

Scientific name^b	Common name
<i>Camassia leichtlinii</i> (Baker) Wats.	Leichtlin's camas
<i>Campanula scouleri</i> Hook.	Scouler's bellflower
<i>Cardamine oligosperma</i> Nutt.	Little western bittercress
<i>Cardamine pulcherrima</i> var. <i>tenella</i> (Pursh) Hitchc.	Slender toothwort
<i>Carex rossii</i> Boott	Ross sedge
<i>Castanopsis chrysophylla</i> (Dougl.) DC.	Golden chinkapin or chinquapin
<i>Castilleja hispida</i> Benth. var. <i>hispida</i>	Harsh paintbrush
<i>Ceanothus sanguineus</i> Pursh	Redstem ceanothus
<i>Ceanothus velutinus</i> Dougl.	Snowbrush
<i>Centaurium muhlenbergii</i> (Griseb.) Wight	Muhlenberg's centaury
<i>Cerastium nutans</i> Raf.	Nodding chickweed
<i>Cerastium viscosum</i> L. ^c	Sticky cerastium
<i>Cheilanthes gracillima</i> D.C. Eat.	Lace lip-fern
<i>Chimphila menziesii</i> (R. Br.) Spreng.	Little prince's-pine
<i>Chimphilla umbellata</i> (L.) Bart.	Prince's-pine
<i>Chrysanthemum leucanthemum</i> L. ^c	Oxeye-daisy
<i>Circaea alpina</i> L.	Enchanter's nightshade or Circaea
<i>Cirsium vulgare</i> (Savi) Tenore	Bull thistle
<i>Clarkia amoena</i> (Lehm.) Nels. & Macbr.	Farewell-to-spring
<i>Clarkia gracilis</i> (Piper) Nels. & Macbr.	Slender godetia
<i>Clarkia purpurea</i> (Curtis) Nels. & Macbr.	Purple godetia
<i>Collinsia grandiflora</i> Lindl.	Large-flowered blue-eyed Mary
<i>Collinsia parviflora</i> Lindl.	Small-flowered blue-eyed Mary
<i>Collomia heterophylla</i> Hook.	Varied-leaf collomia
<i>Corallorhiza maculata</i> Raf.	Spotted coral-root
<i>Cornus nuttallii</i> Aud.	Pacific dogwood
<i>Corylus cornuta</i> Marsh. var. <i>californica</i> DC.	Hazelnut or California hazel
<i>Crataegus monogyna</i> Jacq. ^c	English hawthorn
<i>Crepis</i> sp. L.	Hawksbeard
<i>Cryptantha intermedia</i> (Gray) Greene	Common cryptantha
<i>Cryptogramma acrostichoides</i> (R. Br.) Clarke	Rock-brake
<i>Cynosurus echinatus</i> L. ^c	Hedgehog dogtail
<i>Cystopteris fragilis</i> (L.) Bernh.	Brittle bladder-fern
<i>Danthonia californica</i> Boland. var. <i>californica</i>	California danthonia
<i>Daucus pusillus</i> Michx.	American carrot
<i>Delphinium menziesii</i> DC.	Menzies' larkspur
<i>Dicentra formosa</i> (Andr.) Walp.	Pacific bleedingheart
<i>Digitalis purpurea</i> L. ^c	Foxglove
<i>Disporum smithii</i> (Hook.) Piper	Fairy lantern
<i>Dodecatheon hendersonii</i> Gray	Broad-leaved shooting star
<i>Dodecatheon pulchellum</i> (Raf.) Merrill var. <i>pulchellum</i>	Dark-throat shooting star
<i>Draba verna</i> L.	Spring whitlow-grass
<i>Elymus glaucus</i> Buckl.	Blue wildrye
<i>Epilobium minutum</i> Lindl.	Small-flowered willow-weed
<i>Epilobium paniculatum</i> Nutt.	Autumn willow-weed
<i>Erigeron compositus</i> Pursh var. <i>glabratus</i> Macoun	Cut-leaved daisy
<i>Eriogonum nudum</i> Dougl.	Barestem buckwheat
<i>Eriophyllum lanatum</i> (Pursh) Forbes.	Woolly sunflower

Table 1—Vascular plants found at Horse Rock Ridge Research Natural Area^a (continued)

Scientific name^b	Common name
<i>Erodium cicutarium</i> (L.) L'Her. ^c	Aifilaria or stork's-bill
<i>Erythronium oregonum</i> Applegate	Giant fawn-lily
<i>Euphorbia peplus</i> L.	Petty spurge
<i>Festuca idahoensis</i> Elmer	Idaho fescue
<i>Festuca megalura</i> Nutt. ^c	Foxtail fescue
<i>Festuca microstachys</i> Nutt. ^c	Small fescue
<i>Festuca occidentalis</i> Hook.	Western fescue
<i>Festuca subulata</i> Trin.	Bearded fescue
<i>Fragaria vesca</i> L. var. <i>crinita</i> (Rydb.) Hitchc.	Strawberry
<i>Fragaria virginiana</i> Duchense var. <i>platyphylla</i> (Rydb.) Hall	Broadpetal strawberry
<i>Fritillaria lanceolata</i> Pursh	Rice-root fritillary
<i>Galium aparine</i> L. var. <i>echinospermum</i> (Wallr.) Farw.	Bedstraw
<i>Galium oreganum</i> Britt.	Oregon bedstraw
<i>Galium triflorum</i> Michx.	Sweetscented bedstraw
<i>Gaultheria shallon</i> Pursh	Salal
<i>Geranium dissectum</i> L. ^c	Cut-leaf geranium
<i>Geranium molle</i> L. ^c	Dovefoot geranium
<i>Gilia capitata</i> Sims	Globe gilia
<i>Githopsis specularioides</i> Nutt.	Githopsis or blue-cup
<i>Gnaphalium palustre</i> Nutt.	Lowland cudweed
<i>Goodyera oblongifolia</i> Raf.	Rattlesnake-plantain
<i>Gratiola ebracteata</i> Benth.	Bractless hedge-hyssop
<i>Habenaria elegans</i> (Lindl.) Boland	Elegant bog-orchid
<i>Heterocodon rariflorum</i> Nutt.	Heterocodon
<i>Heuchera micrantha</i> Dougl. var. <i>micrantha</i>	Small-flowered alumroot
<i>Hieracium albiflorum</i> Hook.	White-flowered hawkweed
<i>Holcus lanatus</i> L. ^c	Common velvet-grass
<i>Holodiscus discolor</i> (Pursh) Maxim.	Ocean-spray
<i>Hordeum geniculatum</i> All. ^c	Barley
<i>Hypericum perforatum</i> L.	Common St. John's wort
<i>Hypochaeris glabra</i> L.	Smooth cats-ear
<i>Hypochaeris radicata</i> L. ^c	False dandelion or spotted cats-ear
<i>Iris chrysophylla</i> Howell	Slender-tubed iris
<i>Iris tenax</i> Dougl.	Oregon iris
<i>Isoetes nuttallii</i> A. Br.	Nuttall's quillwort
<i>Juncus bufonius</i> L.	Toad rush
<i>Juncus kelloggii</i> Engelm.	Kellogg's rush
<i>Kelloggia galioides</i> Torr.	Kelloggia
<i>Koeleria cristata</i> Pers.	Prairie Junegrass
<i>Lactuca muralis</i> (L.) Fresen.	Wall lettuce
<i>Lathyrus polyphyllus</i> Nutt.	Leafy peavine
<i>Leontodon nudicaulis</i> (L.) Merat ^c	Hairy hawkbit
<i>Linanthus bicolor</i> (Nutt.) Greene var. <i>bicolor</i>	Bicolored linanthus
<i>Linnaea borealis</i> L. var. <i>longiflora</i> Torr.	Twinflower
<i>Linum usitatissimum</i> L. ^c	Common flax
<i>Lithophragma parviflora</i> (Hook.) Nutt.	Smallflowered woodlandstar
<i>Lomatium utriculatum</i> (Nutt.) Coult. & Rose	Common lomatium
<i>Lonicera ciliosa</i> (Pursh) DC.	Orange honeysuckle

Table 1—Vascular plants found at Horse Rock Ridge Research Natural Area^a (continued)

Scientific name^b	Common name
<i>Lonicera hispidula</i> (Lindl.) Dougl.	Hairy honeysuckle
<i>Lotus micranthus</i> Benth.	Small-flowered deervetch or lotus
<i>Lupinus lepidus</i> Dougl.	Prairie lupine
<i>Lupinus micranthus</i> Dougl.	Small-flowered field lupine
<i>Luzula campestris</i> (L.) DC. var. <i>congesta</i> (Thuill.) E. Meyer	Field woodrush
<i>Madia exigua</i> (J.E. Smith) Gray	Little tarweed
<i>Madia gracilis</i> (J.E. Smith) Keck	Slender tarweed
<i>Madia madioides</i> (Nutt.) Greene	Woodland tarweed
<i>Madia minima</i> (Gray) Keck	Small-head tarweed
<i>Marah oreganus</i> (T. & G.) Howell	Oregon bigroot
<i>Melica subulata</i> (Griseb.) Scribn.	Alaska oniongrass
<i>Microsteris gracilis</i> (Hook.) Greene var. <i>gracilis</i>	Pink microsteris
<i>Mimulus alsinoides</i> Dougl.	Chickweed
<i>Mimulus guttatus</i> DC.	Yellow monkey-flower
<i>Montia parvifolia</i> (Moc.) Greene	Littleleaf montia
<i>Montia perfoliata</i> (Donn) Howell	Miner's lettuce
<i>Montia sibirica</i> (L.) Howell	Western springbeauty
<i>Montia spanthulata</i> (Dougl.) Howell	Pale montia
<i>Myosotis discolor</i> Pers. ^c	Yellow and blue forget-me-not
<i>Nemophila parviflora</i> Dougl.	Small-flowered nemophila
<i>Nothochelone nemorosa</i> (Dougl.) Straw.	Woodland beard-tongue
<i>Orobanche fasciculata</i> Nutt.	Clustered broomrape
<i>Orobanche uniflora</i> L. var. <i>minuta</i> (Suksd.) Beck	Naked broomrape
<i>Orobanche uniflora</i> L. var. <i>purpurea</i> (Heller) Achey	Naked broomrape
<i>Orothocarpus attenuatus</i> Gray	Narrow-leaved owl-clover
<i>Orthocarpus hispidus</i> Benth.	Hairy owl-clover
<i>Orthocarpus pusillus</i> Benth.	Dwarf owl-clover
<i>Osmorhiza chilensis</i> H. & A.	Mountain sweet-root
<i>Oxalis oregana</i> Nutt.	Oregon oxalis
<i>Pachistima myrsinites</i> (Pursh) Raf.	Oregon boxwood
<i>Penstemon</i> sp. Mitch.	Penstemon
<i>Perideridia gairdneri</i> (H. & A.) Math.	Gairdner's yampah
<i>Phacelia linearis</i> (Pursh) Holz.	Threadleaf phacelia
<i>Phacelia nemoralis</i> Greene	Woodland phacelia
<i>Phacelia sericea</i> (Grah.) Gray var. <i>ciliosa</i> Rydb.	Silky phacelia
<i>Philadelphus lewisii</i> Pursh	Lewis mockorange
<i>Phlox adsurgens</i> Torr.	Woodland phlox
<i>Physocarpus capitatus</i> (Pursh) Kuntze	Pacific ninebark
<i>Pityrogramma triangularis</i> (Kaulf.) Maxon.	Gold-fern
<i>Plagiobothrys scouleri</i> (H. & A.) Johnst.	Scouler's popcorn-flower
<i>Plantago lanceolata</i> L. ^c	English plantain
<i>Plectritis congesta</i> (Lindl.) DC.	Rosy plectritis
<i>Plagiobothrys scouleri</i> (H. & A.) Johnst. var. <i>scouleri</i>	Scouler's popcorn-flower
<i>Poa pratensis</i> L. ^c	Kentucky bluegrass
<i>Poa scabrella</i> (Thurb.) Benth.	Pine bluegrass
<i>Poa secunda</i>	Pine bluegrass
<i>Polypodium glycyrrhiza</i> D.C. Eat.	Licorice-fern
<i>Polystichum munitum</i> (Kaulf.) Presl	Sword-fern

Table 1—Vascular plants found at Horse Rock Ridge Research Natural Area^a (continued)

Scientific name^b	Common name
<i>Potentilla glandulosa</i> Lindl. var. <i>glandulosa</i>	Sticky cinquefoil
<i>Prunella vulgaris</i> L. ^c	Self-heal
<i>Prunus emarginata</i> (Dougl.) Walp.	Bitter cherry
<i>Pseudotsuga menziesii</i> (Mirb.) Franco	Douglas-fir
<i>Psoralea physodes</i> Dougl.	California-tea
<i>Pteridium aquilinum</i> (L.) Kuhn	Bracken fern
<i>Quercus garryana</i> Dougl.	Oregon white oak
<i>Ranunculus occidentalis</i> Nutt. var. <i>occidentalis</i>	Western buttercup
<i>Rhamnus purshiana</i> DC.	Cascara
<i>Rhus diversiloba</i> T. & G.	Poison-oak
<i>Ribes sanguineum</i> Pursh	Red-flowered currant
<i>Rosa gymnocarpa</i> Nutt.	Baldhip rose
<i>Rubus leucodermis</i> Dougl.	Blackcap
<i>Rubus parviflorus</i> Nutt.	Thimbleberry
<i>Rubus ursinus</i> Cham. & Schlecht var. <i>macropetalus</i> (Dougl.) Brown	Pacific blackberry
<i>Rumex acetosella</i> L. ^c	Sheep sorrel
<i>Rumex crispus</i> L. ^c	Curly dock
<i>Salix geyeriana</i> Anderss.	Geyer willow
<i>Salix scouleriana</i> Barratt	Scouler willow
<i>Salix sitchensis</i> Sanson	Sitka willow
<i>Sanicula bipinnatifida</i> Dougl.	Purple sanicle
<i>Sanicula crassicaulis</i> Poepp.	Pacific sanicle
<i>Satureja douglasii</i> (Benth.) Briq.	Yerba buena
<i>Saxifraga caespitosa</i> L. var. <i>subgemma</i> (Engl. & Irmsch.) Hitchc.	Tufted saxifrage
<i>Saxifraga integrifolia</i> Hook. var. <i>integrifolia</i>	Swamp saxifrage
<i>Saxifraga nuttallii</i> Small	Nuttall's saxifrage
<i>Saxifraga occidentalis</i> Wats. var. <i>rufidula</i> (Small) Hitchc.	Western saxifrage
<i>Sedum lanceolatum</i> Torr. var. <i>lanceolatum</i>	Lanceleaved sedum
<i>Sedum oregonense</i> (Wats.) Peck	Creamy stonecrop
<i>Sedum roseum</i> (L.) Scop.	King's crown
<i>Sedum spathulifolium</i> Hook.	Spatula-leaf sedum
<i>Selaginella wallacei</i> Hieron	Wallace's selaginella
<i>Senecio intergerrimus</i> Nutt. var. <i>exaltatus</i> (Nutt.) Cronq.	Western groundsel
<i>Senecio jacobaea</i> L. ^c	Tansy ragwort
<i>Sherardia arvensis</i> L. ^c	Blue field-madder
<i>Sidalcea virgata</i> Howell	Sidalcea
<i>Silene gallica</i> L.	Windmill pink
<i>Smilacina stellata</i> (L.) Desf.	Star-flowered Solomon-plume
<i>Sonchus asper</i> (L.) Hill ^c	Prickly sow-thistle
<i>Spiranthes romanzoffiana</i> Cham.	Hooded ladies-tresses
<i>Stachys cooleyae</i> Heller	Cooley's hedge-nettle
<i>Stellaria nitens</i> Nutt.	Shining chickweed
<i>Stipa lemmonii</i> (Vasey) Scribn.	Lemmon's needlegrass
<i>Symphoricarpos albus</i> (L.) Blake	Common snowberry
<i>Symphoricarpos mollis</i> Nutt.	Creeping snowberry
<i>Synthyris reniformis</i> (Dougl.) Benth.	Snow-queen
<i>Taraxacum officinale</i> Weber ^c	Dandelion
<i>Taxus brevifolia</i> Nutt.	Pacific yew

Table 1—Vascular plants found at Horse Rock Ridge Research Natural Area^a (continued)

Scientific name^b	Common name
<i>Thalictrum occidentale</i> Gray	Western meadowrue
<i>Thuja plicata</i> Donn	Western redcedar
<i>Thysanocarpus curvipes</i> Hook.	Sand fringe-pod
<i>Trichostema lanceolatum</i> Benth.	Blue-curls or vinegar weed
<i>Trientalis latifolia</i> Hook.	Western starflower
<i>Trifolium microcephalum</i> Pursh	Woolly clover
<i>Trifolium microdon</i> H. & A.	Thimble clover
<i>Trifolium repens</i> L. ^c	White clover
<i>Trifolium subterraneum</i> L. ^c	Subterranean clover
<i>Trifolium tridentatum</i> Lindl.	Sand clover
<i>Trifolium variegatum</i> Nutt.	White-tip clover
<i>Trifolium wormsjoldii</i> Lehm.	Springbank clover
<i>Trillium ovatum</i> Pursh	Trillium
<i>Trisetum canescens</i> Buckl.	Tall trisetum
<i>Tsuga heterophylla</i> (Raf.) Sarg.	Western hemlock
<i>Vaccinium parvifolium</i> Smith	Red huckleberry
<i>Valeriana sitchensis</i> Bong.	Sitka valerian
<i>Veronica arvensis</i> L. ^c	Common speedwell
<i>Viburnum ellipticum</i> Hook.	Oregon viburnum
<i>Vicia americana</i> Muhl.	American vetch
<i>Vicia gigantea</i> Hook.	Giant vetch
<i>Viola sempervirens</i> Greene	Evergreen violet
<i>Whipplea modesta</i> Torr.	Whipplevine or modesty
<i>Zigadenus venenosus</i> Wats. var. <i>venenosus</i>	Death-camas

^a Information supplied by Cheshire Mayrsohn, botanist, and Nancy Wogen, plant ecologist, Bureau of Land Management, Eugene, OR; Alan B. Curtis, retired BLM forester/botanist, Eugene, OR; John Christy, former BLM botanist, Oregon Natural Heritage Program, Portland, OR; Peter Zika, former BLM botanist and consultant, Seattle, WA; Reid Schuller, ecologist, Natural Areas Association, Bend, OR; Bruce Newhouse, botanist, Salix Associates, Eugene, OR.

^b Nomenclature follows Hitchcock and Cronquist (1976). For name changes, refer to Hickman (1993).

^c Introduced species.

Table 2—Lichens found at Horse Rock Ridge Research Natural Area^a

Scientific name^b

Adelolecia pilati (Hepp) Hertl & Hafellner
Alectoria imshaugii Brodo & D. Hawksw.
Alectoria sarmentosa (Ach.) Ach.
Alectoria vancouverensis (Gyelnik) Gyelnik ex Brodo & D. Hawksw.
Arthonia radiata (Pers.) Ach.
Arthopyrenia antecellens (Nyl.) R.C. Harris
Aspicilia caesiocinerea (Nyl. ex Malbr.) Arnold
Aspicilia mastrucata (Wahlenb.) Th. Fr.
Baeomyces rufus (Hudson) Rebent.
Bryoria friabilis Brodo & D. Hawksw.
Bryoria fuscescens (Gyelnik) Brodo & D. Hawksw.
Bryoria sp. sensu McCune & Geiser (1997)
Bryoria pseudofuscescens (Gyelnik) Brodo & D. Hawksw.
Bryoria trichodes (Michaux) Brodo & D. Hawksw.
Buellia punctata (Hoffm.) A. Massal.
Buellia sp. De Not.
Caloplaca ferruginea (Hudson) Th. Fr.
Caloplaca lithophila H. Magn.
Caloplaca trioliensis Zahlbr.
Candelaria concolor (Dickson) Stein
Candelariella dispersa (Rasanen) Hakul.
Candelariella terrigena Rasanen
Candelariella vitellina (Hoffm.) Mull. Arg.
Candelariella xanthostigma (Ach.) Lettau
Catillaria chalybeia (Borrer) A. Massal.
Cavernularia hultenii Degel.
Cetraria chlorophylla (Willd.) Hale
Cetraria orbata (Nyl.) M.J. Lai
Cladonia borealis S. Stenroos
Cladonia cariosa (Ach.) Sprengel
Cladonia chlorophaea (Florke ex Sommerf.) Sprengel
Cladonia fimbriata (L.) Fr.
Cladonia furcata (Hudson) Schrader
Cladonia ochrochlora Florke
Cladonia pocillum (Ach.) Grognot
Cladonia pxyidata (L.) Hoffm.
Cladonia squamosa var. *subsquamosa* (Nyl. ex Leighton) Vainio
Cladonia transcendens (Vainio) Vainio
Cladonia verruculosa (Vainio) Ahti
Coelocaulon aculeatum (Schreber) Link
Collema glebulentum (Nyl. ex Crombie) Degel.
Dermatocarpon intestiniforme (Korber) Hasse
Dermatocarpon miniatum (L.) W. Mann
Diploschistes muscorum (Scop.) R. Sant.
Diploschistes scruposus (Schreber) Norman
Ephebe lanata (L.) Vainio
Ephebe solida Bornet
Euopsis granatina (Sommerf.) Nyl.

**Table 2—Lichens found at Horse Rock Ridge Research Natural Area^a
(continued)**

Scientific name^b

Evernia prunastri (L.) Ach.
Fuscopannaria aurita P.M. Jorg.
Fuscopannaria pulveracea (P.M. Jorg. & Henssen) P.M. Jorg.
Fuscopannaria thiersii P.M. Jorg.
Hypocenomyce castaneocinerea (Rasanen) Timdal
Hypocenomyce scalaris (Ach.) Choisy
Hypogymnia enteromorpha (Ach.) Nyl.
Hypogymnia imshaugii Krog
Hypogymnia inactiva (Krog) Ohlsson
Hypogymnia metaphysodes (Asah.) Rass.
Hypogymnia occidentalis L. Pike
Hypogymnia physodes (L.) Nyl.
Hypogymnia tubulosa (Schaerer) Hav.
Hypotrachyna sinuosa (Sm.) Hale
Japewia tornoensis (Nyl.) Tonsberg
Lecanora carpinea (L.) Vainio
Lecanora hagenii (Ach.) Ach.
Lecanora pacifica Tuck.
Lecanora pulicaris (Pers.) Ach.
Lecanora rupicola (L.) Zahlbr.
Lecanora semitensis Tuck.
Lecanora zosteræ (Ach.) Nyl.
Lecidea atrobrunnea (Raymond ex Lam. & DC.) Schaerer
Lecidea dolodes Nyl.
Lecidea enalla Fr.
Lecidea mannii Tuck.
Lecidea tessellata Florke
Lecidea sp. Ach.
Lecidella elaeochroma (Ach.) Hazsl.
Lecidella stigmatæa (Ach.) Hertel & Leuckert
Lecidella wulfenii (Hepp) Korber
Leprocaulon subalbicans (Lamb) Lamb & Ward
Leproloma cacuminum (A. Massal.) Lothander
Leproloma vouauxii (Hue) J.R. Laundon
Leptochidium albociliatum (Desmaz.) Choisy
Leptogium corniculatum (Hoffm.) Minks
Leptogium lichenoides (L.) Zahlbr.
Leptogium saturninum (Dickson) Nyl.
Leptogium tacomæ P.M. Jorg.
Letharia vulpina (L.) Hue
Lichenella stipatula Nyl.
Lobaria oregana (Tuck.) Mull. Arg.
Lobaria pulmonaria (L.) Hoffm.
Lobaria scrobiculata (Scop.) DC.
Lobothallia alphoplaca (Wahlenb.) Hafellner
Loxosporopsis corallifera Brodo, Henssen & Imahsug
Melanelia exasperatula (Zahlbr.) Essl.

**Table 2—Lichens found at Horse Rock Ridge Research Natural Area^a
(continued)**

Scientific name^b

Melanelia fuliginosa (Fr. ex Duby) Essl.
Melanelia panniformis (Nyl.) Essl.
Melanelia subelegantula (Essl.) Essl.
Menegazzia terebrata (Hoffm.) A. Massal.
Mycoblastus sanguinarius (L.) Norman
Neofuscelia verruculifera (Nyl.) Essl.
Nephroma laevigatum Ach.
Nodobryoria oregana (Tuck.) Common & Brodo
Normandina pulchella (Borrer) Nyl.
Ochrolechia oregonensis H. Magn.
Ochrolechia subpallescens Vers.
Ochrolechia upsaliensis (L.) A. Massal
Ophioparma rubicosa (Muell. Arg.) Ekman
Parmelia hygrophila Goward & Ahti
Parmelia pseudosulcata Gyelnik
Parmelia saxatilis (L.) Ach.
Parmelia sulcata Taylor
Parmeliopsis hyperopta (Ach.) Arnold
Peltigera britannica (Gyelnik) Holt.-Hartw. & Tonsb.
Peltigera collina (Ach.) Schrader
Peltigera leucophlebia (Nyl.) Gyelnik
Peltigera membranacea (Ach.) Nyl.
Peltigera praetextata (Florke ex Sommerf.) Zopf
Pertusaria amara (Ach.) Nyl.
Pertusaria borealis Erichsen
Pertusaria leucostoma A. Massal.
Pertusaria ophthalmiza (Nyl.) Nyl.
Pertusaria stenhammari Hellb.
Pertusaria subambigens Dibben
Pertusaria sp. DC.
Phlyctis argena (Sprengel) Flotow
Phlyctis speirea G. Merr.
Phylliscum demangeonii (Moug. & Mont.) Nyl.
Physcia adscendens (Fr.) H. Olivier
Physcia aipolia (Ehrh. ex Humb.) Furnr.
Physcia tenella (Scop.) DC.
Physconia enteroxantha (Nyl.) Poelt
Physconia perisidiosa (Erichsen) Moberg
Pilophorus acicularis (Ach.) Th. Fr.
Placopsis gelida (L.) Lindsay
Placynthiella uliginosa (Schrader) Coppins & P. James
Platismatia glauca (L.) Culb. & C. Culb.
Platismatia herrei (Imshaug) Culb. & C. Culb.
Platismatia stenophylla (Tuck.) Culb. & C. Culb.
Polyblastia sp. A. Massal.
Polychidium muscicola (SW.) Gray
Polysporina simplex (Davies) Vezda

**Table 2—Lichens found at Horse Rock Ridge Research Natural Area^a
(continued)**

Scientific name^b

Porpidia crustulata (Ach.) Hertel & Knoph
Protoparmelia badia (Hoffm.) Hafellner
Protoparmelia ochrococca P.M. Jorg., Rambold & Hertel
Pseudocyphellaria anomala Brodo & Ahti
Pseudocyphellaria anthraxis (Ach.) H. Magn.
Pseudocyphellaria crocata (L.) Vainio
Psora nipponica (Zahlbr.) Gotth. Schneider
Ramalina dilacerata (Hoffm.) Hoffm.
Ramalina farinacea (L.) Ach.
Rhizocarpon copelandii (Korber) Th. Fr.
Rhizocarpon geminatum Korber
Rhizocarpon sp. Ramond ex DC.
Rimularia insularis (Nyl.) Rambold & Hertel
Rinodina archaea (Ach.) Arnold
Rinodina hallii Tuck.
Rinodina stictica Sheard & Tonsberg
Rinodina sp. (Ach.) Gray
Schaereria cinereorufa (Schaerer) Th. Fr.
Schaereria fuscocinerea (Nyl.) Clauzade & Roux
Sphaerophorus globosus (Hudson) Vainio
Stenocybe clavata Tibell
Stereocaulon intermedium (Savicz) H. Magn.
Stereocaulon sterile (Savicz) Lamb ex Krog
Stereocaulon tomentosum Fr.
Sticta fuliginosa (Hoffm.) Ach.
Sticta limbata (Sm.) Ach.
Tephromela atra (Hudson) Hafellner
Thamnolia vermicularis (Sw.) Ach. ex Schaerer
Trapeliopsis flexuosa (Fr.) Coppins & P. James
Trapeliopsis wallrothii (Florke) Hertel & Gotth. Schneider
Umbilicaria phaea Tuck.
Umbilicaria torrefacta (Lightf.) Schrader
Usnea cavernosa Tuck.
Usnea diplotypus Vainio
Usnea filipendula Stirton
Usnea pacificana Halonen
Usnea scabrata Nyl.
Usnea subfloridana Stirton
Usnea wirthii P. Clerc
Xanthoparmelia angustiphylla (Gyelnik) Hale
Xanthoparmelia cumberlandia (Gyelnik) Hale
Xanthoria polycarpa (Hoffm.) Rieber
Xylographa parallela (Ach.:Fr.) Behlen & Desberg

^a Information supplied by Bruce McCune, Professor, Oregon State University, Corvallis, OR; Sherwood, M. 1979. (4 April) Letter on file with: district botanist, USDI Bureau of Land Management, P.O. Box 10226, Eugene, OR 97440-2226.

^b Nomenclature follows Esslinger and Egan (1995).

Table 3—Bryophytes found at Horse Rock Ridge Research Natural Area^a

Scientific name^b

Liverworts:

Asterella californica (Hampe) Underw.
Cephaloziella divaricata (Sm.) Schiffn.
Douinia ovata (Dicks.) H. Buch
Frullania californica (Austin) A. Evans
Gymnomitrium obtusum (Lindb.) Pears.
Marsupella emarginata (Ehrh.) Dumort.
Plagiochila porelloides (Torr. ex Nees) Lindenb.
Scapania americana Muell. Frib.
Scapania paludosa (Muell. Frib.) Muell. Frib.

Mosses:

Amphidium californicum (Hampe ex C. Muell.) Broth.
Anacolia menziesii (Turn.) Par.
Antitrichia curtispindula (Hedw.) Brid.
Atrichum selwynii Aust.
Bartramia pomiformis Hedw.
Blindia acuta (Hedw.) Bruch & Schimp in B.S.G.
Bryum argenteum Hedw.
Bryum miniatum Lesq.
Ceratodon purpureus (Hedw.) Brid.
Claopodium bolanderi Best.
Dicranum scoparium Hedw.
Didymodon vinealis (Brid.) Zand.
Encalypta ciliata Hedw.
Entosthodon fascicularis (Hedw.) C. Muell.
Eurhynchium oreganum (Sull.) Jaeg.
Funaria hygrometrica Hedw.
Grimmia pulvinata (Hedw.) Sm.
Grimmia torquata Hornsch. in Grev.
Homalothecium fulgescens (Mitt. ex C. Muell.) Lawt.
Hylocomium splendens (Hedw.) Schimp. in B.S.G.
Hypnum subimponens Lesq.
Isothecium myosuroides Brid.
Orthotrichum lyellii Hook. & Tayl.
Orthotrichum pulchellum Brunt. in Winch. & Gateh.
Orthotrichum rupestre Schleich. ex Schwaegr.
Orthotrichum speciosum Nees in Sturm
Philonotis fontana (Hedw.) Brid.
Plagiomnium venustum (Mitt.) T. Kop.
Pleuridium subulatum (Hedw.) Rabenh.
Pohlia cruda (Hedw.) Lindb.
Polytrichastrum alpinum (Hedw.) G.L. Sm.
Polytrichum juniperinum Hedw.
Polytrichum piliferum Hedw.
Pseudobraunia californica (Lesq.) Broth.
Racomitrium aciculare (Hedw.) Brid.
Racomitrium canescens (Hedw.) Brid.

**Table 3—Bryophytes found at Horse Rock Ridge Research Natural Area^a
(continued)**

Scientific name^b

Racomitrium elongatum Ehrh. ex Frisv.
Racomitrium heterostichum (Hedw.) Brid.
Rhytidiadelphus triquetrus (Hedw.) Warnst.
Scleropodium cespitans (C. Muell.) L. Koch
Timmiella crassinervis (Hampe) L. Koch
Tortula ruralis (Hedw.) Gaertn. et al.
Trachybryum megaptilum (Sull.) Schof.
Weissia controversa Hedw.

^a Information supplied by John Christy, former BLM botanist, Oregon Natural Heritage Program, Portland, OR, and Bruce Newhouse, botanist, Salix Associates, Eugene, OR.

^b Nomenclature follows Anderson et al. (1990) and Stotler and Crandall-Stotler (1977).

Table 4—Birds expected to use Horse Rock Ridge Research Natural Area^a

Family	Scientific name^b	Common name
Ardeidae	<i>Ardea herodias</i>	Great blue heron
	<i>Butorides virescens</i>	Green heron
Cathartidae	<i>Cathartes aura</i>	Turkey vulture
Accipitridae	<i>Accipiter cooperii</i>	Cooper's hawk
	<i>Accipiter gentilis</i>	Northern goshawk
	<i>Accipiter striatus</i>	Sharp-shinned hawk
	<i>Aquila chrysaetos</i>	Golden eagle
	<i>Buteo jamaicensis</i>	Red-tailed hawk
Falconidae	<i>Falco sparverius</i>	American kestrel
Phasianidae	<i>Bonasa umbellus</i>	Ruffed grouse
	<i>Dendragapus obscurus</i>	Blue grouse
Odontophoridae	<i>Oreortyx pictus</i>	Mountain quail
Columbidae	<i>Columba fasciata</i>	Band-tailed pigeon
	<i>Zenaida macroura</i>	Mourning dove
Tytonidae	<i>Tyto alba</i>	Barn owl
Strigidae	<i>Aegolius acadicus</i>	Northern saw-whet owl
	<i>Bubo virginianus</i>	Great horned owl
	<i>Glaucidium gnoma</i>	Northern pygmy owl
	<i>Otus kennicottii</i>	Western screech owl
	<i>Strix nebulosa</i>	Great gray owl
	<i>Strix occidentalis</i>	Spotted owl
	<i>Strix varia</i>	Barred owl
Caprimulgidae	<i>Chordeiles minor</i>	Common nighthawk
Apodidae	<i>Chaetura vauxi</i>	Vaux's swift
Trochilidae	<i>Selasphorus rufus</i>	Rufous hummingbird
	<i>Stellula calliope</i>	Calliope hummingbird
Picidae	<i>Colaptes auratus</i>	Northern flicker
	<i>Dryocopus pileatus</i>	Pileated woodpecker
	<i>Picoides pubescens</i>	Downy woodpecker
	<i>Picoides villosus</i>	Hairy woodpecker
	<i>Sphyrapicus ruber</i>	Red-breasted sapsucker
Tyrannidae	<i>Contopus cooperi</i>	Olive-sided flycatcher
	<i>Contopus sordidulus</i>	Western wood-pewee
	<i>Empidonax difficilis</i>	Pacific-slope flycatcher
	<i>Empidonax hammondii</i>	Hammond's flycatcher
	<i>Empidonax oberholseri</i>	Dusky flycatcher
Vireonidae	<i>Vireo cassinii</i>	Cassin's vireo
	<i>Vireo gilvus</i>	Warbling vireo
	<i>Vireo huttoni</i>	Hutton's vireo
	<i>Vireo solitarius</i>	Blue-headed vireo

**Table 4—Birds expected to use Horse Rock Ridge Research Natural Area^a
(continued)**

Family	Scientific name^b	Common name
Corvidae	<i>Corvus brachyrhynchos</i>	American crow
	<i>Corvus corax</i>	Common raven
	<i>Cyanocitta stelleri</i>	Steller's jay
	<i>Perisoreus canadensis</i>	Gray jay
Hirundinidae	<i>Progne subis</i>	Purple martin
	<i>Tachycineta thalassina</i>	Violet-green swallow
Paridae	<i>Poecile atricapillus</i>	Black-capped chickadee
	<i>Poecile rufescens</i>	Chestnut-backed chickadee
Aegithalidae	<i>Psaltriparus minimus</i>	Bushtit
Certhiidae	<i>Certhia americana</i>	Brown creeper
Sittidae	<i>Sitta canadensis</i>	Red-breasted nuthatch
Troglodytidae	<i>Troglodytes troglodytes</i>	Winter wren
Regulidae	<i>Regulus calendula</i>	Ruby-crowned kinglet
	<i>Regulus satrapa</i>	Golden-crowned kinglet
Turdidae	<i>Catharus guttatus</i>	Hermit thrush
	<i>Catharus ustulatus</i>	Swainson's thrush
	<i>Ixoreus naevius</i>	Varied thrush
	<i>Turdus migratorius</i>	Robin
Parulidae	<i>Dendroica coronata</i>	Yellow-rumped warbler
	<i>Dendroica nigrescens</i>	Black-throated gray warbler
	<i>Dendroica occidentalis</i>	Hermit warbler
	<i>Dendroica townsendi</i>	Townsend's warbler
	<i>Oporornis tolmiei</i>	MacGillivray's warbler
	<i>Vermivora celata</i>	Orange-crowned warbler
	<i>Wilsonia pusilla</i>	Wilson's warbler
Thraupidae	<i>Piranga ludoviciana</i>	Western tanager
Emberizidae	<i>Junco hyemalis</i>	Dark-eyed junco
	<i>Melospiza melodia</i>	Song sparrow
	<i>Pipilo erythrophthalmus</i>	Rufous-sided towhee
Cardinalidae	<i>Pheucticus melanocephalus</i>	Black-headed grosbeak
Fringillidae	<i>Carduelis pinus</i>	Pine siskin
	<i>Carduelis tristis</i>	American goldfinch
	<i>Carpodacus purpureus</i>	Purple finch
	<i>Coccothraustes vespertinus</i>	Evening grosbeak
	<i>Loxia curvirostra</i>	Red crossbill

^a Information supplied by Paula Larson, wildlife biologist, Bureau of Land Management, Eugene, OR, and Charles Thomas, former BLM wildlife biologist.

^b Birds listed are expected to use the area at some time of year.

^c Nomenclature follows National Geographic Society (1999).

Table 5—Mammals expected to use Horse Rock Ridge Research Natural Area^a

Family	Scientific name^b	Common name
Didelphiidae	<i>Didelphis marsupialis</i>	Opossum
Soricidae	<i>Sorex trowbridgei</i>	Trowbridge shrew
	<i>Sorex vagrans</i>	Vagrant shrew
Talpidae	<i>Neurotrichus gibbsi</i>	Shrew-mole
	<i>Scapanus orarius</i>	Pacific mole
Vespertilionidae	<i>Antrozous pallidus</i>	Pallid bat
	<i>Eptesicus fuscus</i>	Big brown bat
	<i>Lasionycteris noctivagans</i>	Silver-haired bat
	<i>Lasiurus cinereus</i>	Hoary bat
	<i>Myotis californicus</i>	California myotis
	<i>Myotis evotis</i>	Long-eared myotis
	<i>Myotis lucifugus</i>	Little brown myotis
	<i>Myotis thysanodes</i>	Fringed myotis
	<i>Myotis volans</i>	Long-legged myotis
	<i>Myotis yumanensis</i>	Yuma myotis
	<i>Plecotus townsendi</i>	Western big-eared bat
Ursidae	<i>Ursus americanus</i>	Black bear
Procyonidae	<i>Procyon lotor</i>	Raccoon
Mustelidae	<i>Mephitis mephitis</i>	Striped skunk
	<i>Mustela erminea</i>	Short-tailed weasel
	<i>Mustela frenata</i>	Long-tailed weasel
	<i>Spilogale putorius</i>	Spotted skunk
Canidae	<i>Canis latrans</i>	Coyote
	<i>Urocyon cinereoargenteus</i>	Gray fox
	<i>Vulpes fulva</i>	Red fox
Felidae	<i>Felis concolor</i>	Mountain lion
	<i>Lynx rufus</i>	Bobcat
Aplodontiidae	<i>Aplodontia rufa</i>	Mountain beaver
Sciuridae	<i>Eutamias townsendi</i>	Townsend chipmunk
	<i>Glaucomys sabrinus</i>	Northern flying squirrel
	<i>Sciurus griseus</i>	Western gray squirrel
	<i>Tamiasciurus douglasi</i>	Chickaree
Cricetidae	<i>Clethrionomys occidentalis</i>	Western redback vole
	<i>Microtus oregoni</i>	Creeping or Oregon vole
	<i>Microtus townsendi</i>	Townsend vole
	<i>Neotoma fuscipes</i>	Dusky-footed woodrat
	<i>Peromyscus maniculatus</i>	Deer mouse
	<i>Phenacomys longicaudus</i>	Red tree vole
Zapodidae	<i>Zapus trinotatus</i>	Pacific jumping mouse

**Table 5—Mammals expected to use Horse Rock Ridge Research Natural Area^a
(continued)**

Family	Scientific name^b	Common name
Leporidae	<i>Lepus americanus</i>	Snowshoe hare
	<i>Sylvilagus bachmani</i>	Brush rabbit
Erethizontidae	<i>Erethizon dorsatum</i>	Porcupine
Cervidae	<i>Cervus elaphus</i>	Elk
	<i>Odocoileus hemionus</i>	Blacktail deer

^a Information supplied by Paula Larson, BLM wildlife biologist, Eugene, OR; and Charles Thomas, former BLM wildlife biologist.

^b Mammals listed are expected to use the area at some time of year.

^c Nomenclature follows Burt and Grossenheider (1980).

Table 6—Mollusks, amphibians, and reptiles expected to use Horse Rock Ridge Research Natural Area^{a b}

Scientific name ^c	Common name
Mollusks:	
Probably present—	
<i>Ancotrema sportella</i>	Beaded lancetooth (snail)
<i>Ariolimax columbianus</i>	Pacific bananaslug
<i>Haplotrema vancouverense</i>	Robust lancetooth (snail)
<i>Monadenia fidelis</i>	Pacific sideband (snail)
Possibly present—	
<i>Ancotrema hybridum</i>	Oregon lancetooth (snail)
<i>Carychium occidentale</i>	Western thorn (small snail ^d)
<i>Cryptomastix germana</i>	Pygmy Oregonian (small snail ^d)
<i>Deroceras laeve</i>	Meadow slug
<i>Euconulus fulvus alaskensis</i>	Western brown hive (small snail ^d)
<i>Megomphix hemphilli</i>	Oregon megomphix ^e (snail)
<i>Nearctula rowelli</i>	Threaded vertigo (small snail ^d)
<i>Pristiloma arcticum crateris</i>	Crater Lake tightcoil ^e (small snail ^d)
<i>Pristiloma lansingi</i>	Denticulate tightcoil (small snail ^d)
<i>Pristiloma stearnsii</i>	Striate tightcoil (small snail ^d)
<i>Prophysaon andersoni</i>	Reticulate taildropper (slug)
<i>Prophysaon coeruleum</i>	Blue-gray taildropper (slug)
<i>Prophysaon dubium</i>	Papillose taildropper (slug)
<i>Punctum randolphii</i>	Conical spot (small snail ^d)
<i>Striatura pugetensis</i>	Northwest striate (small snail ^d)
<i>Vespericola columbianus</i>	Northwest hesperian (snail)
Amphibians:	
Probably present—	
<i>Ambystoma gracile</i>	Northwestern salamander
<i>Dicamptodon tenebrosus</i>	Pacific giant salamander
<i>Ensatina eschscholtzii</i>	Ensatina (salamander)
<i>Hyla regilla</i>	Pacific treefrog
<i>Plethodon dunni</i>	Dunn's salamander
<i>Taricha granulosa</i>	Rough-skinned newt
Possibly present—	
<i>Aneides ferreus</i>	Clouded salamander ^e
<i>Batrachoseps wrightorum</i>	Oregon slender salamander ^e
<i>Rana aurora aurora</i>	Northern red-legged frog ^e
Reptiles:	
Probably present—	
<i>Charina bottae</i>	Rubber boa
<i>Diadophis punctatus</i>	Ringneck snake
<i>Elgaria coerulea</i>	Northern alligator lizard
<i>Eumeces skiltonianus</i>	Western skink
<i>Thamnophis ordinoides</i>	Northwestern garter snake
<i>Thamnophis sirtalis</i>	Common garter snake

Table 6—Mollusks, amphibians, and reptiles expected to use Horse Rock Ridge Research Natural Area^{a b} (continued)

Scientific name ^c	Common name
Possibly present—	
<i>Coluber constrictor</i>	Racer (snake)
<i>Contia tenuis</i>	Sharptail snake ^e
<i>Elgaria multicarinata</i>	Southern alligator lizard
<i>Pituophis catenifer</i>	Gopher snake
<i>Sceloporus occidentalis</i>	Western fence lizard
<i>Thamnophis elegans</i>	Western terrestrial garter snake

^a Information supplied by John Applegarth, wildlife biologist, Bureau of Land Management, Eugene, OR 97440.

^b Species listed are expected to use the area at some time of year.

^c Nomenclature follows Turgeon (1998) for mollusks, Leonard et al. (1993) for amphibians, and Storm and Leonard (1995) for reptiles.

^d For this list a “small snail” is defined as having a shell that is less than 1 centimeter in diameter or length when mature.

^e Species listed as “special status” with the Oregon Natural Heritage Program as of February 2001.

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