UPPER ELK MEADOWS RESEARCH NATURAL AREA

Supplement No. 18[1]

Alan B. Curtis[2]

The Research Natural Area described in this supplement is administered by the Bureau of Land Management, U.S. Department of the Interior. Bureau of Land Management Research Natural Areas are administered by District Offices which are organizational subdivisions of their State Offices. Scientists wishing to use these Research Natural Areas (RNA) should contact the Bureau's State Director. Because this tract is located in Oregon, the responsible individual is the Oregon State Director (Bureau of Land Management, P.O. Box 2965, Portland, Oregon 97208). The manager of the district in which the Research Natural Area is located will be informed of mutually agreed on activities by the State Director. Nevertheless, a scientist should visit the administering District Office when beginning a study and explain the nature, purpose, and duration of activities planned. Permission for brief observational visits to Research Natural Areas can be obtained from District Managers.

Upper Elk Meadows Research Natural Area is part of a Federal system of such tracts established for research and educational purposes. Each RNA constitutes a site where natural features are preserved for scientific purposes and natural processes are allowed to dominate. Their main purposes are to provide:

1. Baseline areas against which effects of human activities can be measured;
2. Sites for study of natural processes in undisturbed ecosystems; and
3. Gene pool preserves for all types of organisms, especially rare and endangered types.

The Federal system is outlined in "A Directory of the Research Natural Areas on Federal Lands of the United States of America."[3]

Of the 96 Federal Research Natural Areas 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). Supplements to the guidebook described additions to the system.

The guiding principle in management of Research Natural Areas is to prevent unnatural encroachments or activities that directly or indirectly modify ecological processes. Logging and uncontrolled grazing are not allowed, for example, nor is public use that might impair scientific or educational values. Management practices necessary for maintenance of ecosystems may be allowed.

Federal Research Natural Areas provide a unique system of publicly owned and protected examples of undisturbed 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. In return, a scientist wishing to use a Research Natural Area is obligated to:

1. Obtain permission from the appropriate administering agency before using the area;[4]

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[1] Supplement No. 18 to "Federal Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators," by Jerry F. Franklin, Frederick C. Hall, C.T. Dyrness, and Chris Maser (U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, 498 p., 1972).

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[3] Federal Committee on Ecological Reserves. A directory of the Research Natural Areas on Federal lands of the United State of America. Washington, DC: U.S. Department of Agriculture, Forest Service; 1977.

[4] Six agencies cooperate in this program in the Pacific Northwest: U.S. Department of Agriculture—Forest Service; U.S. Department of the Interior—Bureau of Land Management, Fish and Wildlife Service, and National Park Service; U.S. Department of Energy; and U.S. Department of Defense.

2. Abide by the administering agency's regulations governing use, including specific limitations on the type of research, sampling methods, and other procedures; and
3. Inform the administering agency on progress of the research, published results, and disposition of collected materials.

The purpose of these limitations is to:

1. Ensure that the scientific and educational values of the tract are not impaired;
2. Accumulate a documented body of knowledge about the tract; and
3. Avoid conflict between studies.

Research must be essentially nondestructive; destructive analysis of vegetation is generally not allowed, nor are studies requiring extensive modification of the forest floor or extensive excavation of soil. Collection of plant and animal specimens should be restricted to the minimum necessary to provide voucher specimens and other research needs. Under no circumstances may collecting significantly reduce population levels of species. Collecting must also be carried out in accordance with applicable State and Federal agency regulations. Within these broad guidelines, appropriate uses of Research Natural Areas are determined by the administering agency.

UPPER ELK MEADOWS RESEARCH NATURAL AREA

A mosaic of open and shrub-covered wetlands surrounded by old-growth *Abies amabilis-Abies grandis* and *Pseudotsuga menziesii* forests.[5]

The Upper Elk Meadows Research Natural Area was established in January 1984 to exemplify the diversity of species in the valleys and mountains of the Cascade Range and the Coast Range. The RNA incorporates a remnant of the old-growth forest that once was prevalent west of the Cascade Range in Oregon. Now this timbered area appears as an island surrounded by a sea of clearcuts and the beginning of a new forest. Botanists have identified 200 species of vascular plants at the RNA. Four distinct plant communities are in the area: open, wet *Carex* meadows; wet *Alnus sinuata-Salix* spp.-*Crataegus douglasii* thickets; open forest dominated by old-growth *Abies amabilis-Abies grandis;* and closed forest dominated by old-growth *Pseudotsuga menziesii* (fig. 1). This 82-ha (203-acre) area is located in Douglas County, Oregon, and is administered by the Dorena Resource Area of the Eugene District of the Bureau of Land Management (BLM). The RNA is situated in section 35, T. 23 S., R. 2 W., Willamette Meridian (lat. 43° 32' N.; long. 122° 54' W.).

[5] Scientific and common names of plant species are listed in table 1.

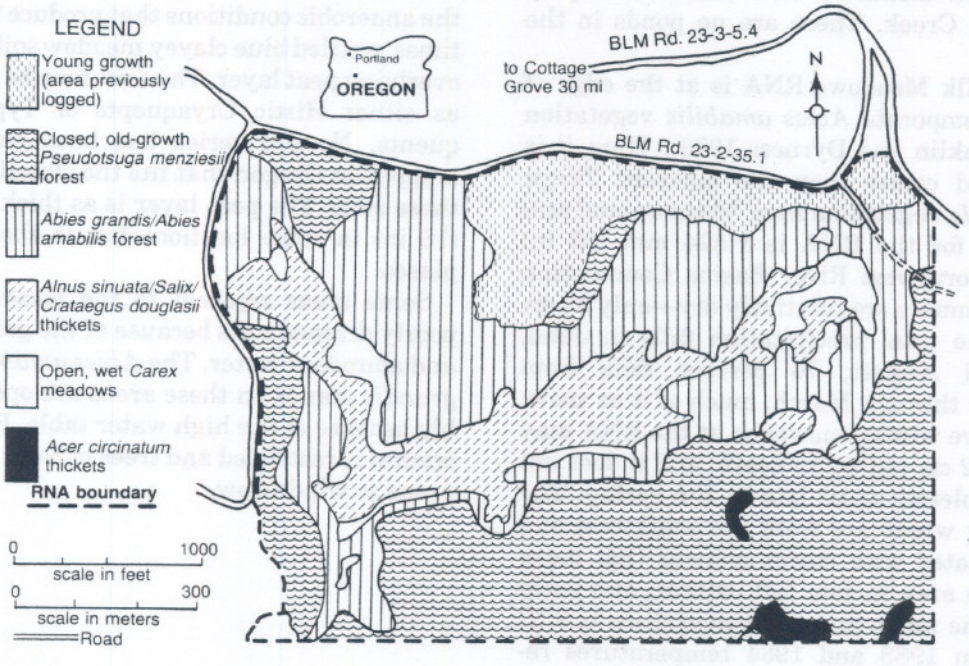

Figure 1.—Plant communities of Upper Elk Meadows Research Natural Area.

Access and Accommodations

To reach the RNA, take U.S. Interstate 5 to Exit 170 (London Road) 4 km (2½ mi) south of Cottage Grove, Oregon. Travel south on London Road for 22 km (14 mi) to the BLM Big River Access Road (No. 23-3-5.4). Drive 22 km (14 mi) to a spur road (No. 23-2-35.1) which is the northern boundary of the RNA.

The closest commercial accommodations are located in Cottage Grove, 48 km (30 mi) to the northwest. Scheduled commercial air service is available at Eugene, 32 km (20 mi) north of Cottage Grove.

Environment

The Upper Elk Meadows RNA is situated on the Calapooya Divide, a westward extension of the Cascade Range in the Western Cascades Province (Franklin and Dyrness 1973). Lying near the crest of a ridge, most of the gentle slopes on the RNA have a southern exposure. Elevations range from 1 219 to 1 311 m (4,000 to 4,300 ft). Several perennial springs, located in the open meadows, flow southwesterly to form Rock Creek. There are no ponds in the RNA.

Upper Elk Meadows RNA is at the edge of the cool temperate *Abies amabilis* vegetation zone (Franklin and Dyrness 1973). Thus, it is wetter and cooler than the adjacent *Tsuga heterophylla* vegetation zone. Mean annual precipitation for the RNA is 1 524 mm (60 in) (Pacific Northwest River Basins Commission 1970). Summers are relatively dry—only 5 percent of the total precipitation falls in June, July, and August; 70 percent falls from November through March, much of it as snow. Cumulative winter snowpack at the RNA may exceed 122 cm (48 in) in depth, and it does not melt completely until late in the spring. The prevailing winds are from the southwest and are associated with storm systems that move across the area in late fall, winter, and early spring. The mean annual temperature is 9 °C (48 °F). In 1983 and 1984 temperatures recorded at the RNA ranged from -18 °C (0 °F) to 28 °C (83 °F).

Soils

Soils in the heavily forested areas fall into two units. The first is dominated by the Keel series, with small inclusions of Winberry and Holderman soils. These soils are generally deep, well-drained, and have clayey-loam textures. Parent material is basalt and other basic volcanic rocks. Timber production on these types of soils is typically high. The second series is the Holderman series which occurs in complex with the Winberry series. The latter soils are scattered throughout the area and represent about 20 percent of the total. These soils vary from moderately deep to shallow and are derived from basalt parent material. Typically these soils have more than 35 percent coarse fragments. Productivity is somewhat less than in the Keel unit.

Basalt underlies the soils in forested areas but is not present in the meadows. This basalt is permeable and collects snowmelt water, which then percolates downward until it encounters a layer of impermeable pyroclastic rock. The water flows laterally on this rock and surfaces at several locations in the meadows. This cold, slow-moving water is responsible for the anaerobic conditions that produce the sometimes mottled blue clayey meadow soils and the overlying peat layer. The soils may be classified as either Histic Cryaquepts or Typic Cryaquents. No soil series has been extensively mapped in Oregon that fits the classification of these soils. The peat layer is as thick as 41 cm (16 in) in some locations but is absent other places.

Some areas adjacent to the meadows have poorly drained soils because of the gentle relief and abundant water. The *Abies amabilis-Abies grandis* stands on these areas are open, probably because of the high water table. Root penetration is restricted and trees on such areas are prone to windthrow.

Biota

Vegetation

The Upper Elk Meadows RNA is a mosaic of open and shrub-covered wetlands surrounded by old-growth forests (figs. 1 and 2). Open wet *Carex* meadows occupy approximately 4 ha (11 acres); wet *Alnus sinuata-Salix-Crataegus douglasii* thickets occupy 12 ha (30 acres); an open forest dominated by old-growth *Abies amabilis-Abies grandis* occupies 30 ha (74 acres); and a closed old-growth forest dominated by *Pseudotsuga menziesii* occupies 27 ha (66 acres). In addition, there is a cutover area and a very small non-forested site.

The wettest vegetation community is the open wet *Carex* meadows, located in the vicinity of perennial springs. Water from these springs flows over the soil surface, keeping it cold and wet. The growing season is also limited by late-persisting snowbanks. In midsummer, however, these meadows are very showy because of the many wildflowers. Major species include *Carex luzulina, C. vesicaria, Scirpus microcarpus, Arnica amplexicaulis, Camassia leichtlinii, Erigeron aliceae, Habenaria dilatata, Polygonum bistortoides, Rudbeckia occidentalis,* and *Senecio triangularis.*

Also common is *Sidalcea cusickii,* a candidate species for listing by the U.S. Fish and Wildlife Service (Meinke 1981). Of special interest are *Botrychium multifidum,* a fern with disjunct populations; *Trifolium howellii,* an uncommon clover growing near the northern limit of its range; and *Hypericum anagalloides,* a dwarf plant often found at higher elevations.

The *Alnus sinuata-Salix* spp.-*Crataegus douglasii* thicket (fig. 3) is an invasive community that is expanding into the open wet *Carex* meadows. These sites are subject to deep accumulations of snow; water flows on the soil surface most of the year; and the soil is very poorly drained. *Alnus sinuata* occurs primarily near the edges of the meadows where it abuts with the *Abies* forest. At these locations *Alnus sinuata* stems are strongly bowed, yet they grow 6 m (20 ft) tall.

Figure 2.—Upper Elk Meadows Research Natural Area showing a mosaic of open and shrub-covered wetlands. Crataegus douglasii *in the center of the picture is a very invasive species that is advancing into open portions of the meadow (right).*

Figure 3.—A nearly impenetrable shrub thicket composed of Alnus sinuata-Salix *spp.*-Crataegus douglasii *occupies the lower portion of the meadow at Upper Elk Meadows Research Natural Area.*

Several *Salix* species, occurring in dense clumps throughout the meadows, are dominant in the lower center portions of the RNA. *Salix geyeriana,* the most common species, seldom reaches more than 4.5 m (15 ft) in height.

Crataegus douglasii forms impenetrable thickets at numerous locations throughout the meadows. The largest individuals are 8 m (26 ft) tall, and ring counts reveal that they are more than 70 years old. Associated with *Crataegus douglasii* is *Pyrus fusca,* although it is less common. Both of these small trees are more commonly found at lower elevations. It is unusual for them to be associated with *Alnus sinuata,* an upper elevation, wet-site species. Two other small trees, *Sorbus sitchensis* and *Prunus emarginata,* also occur in the meadows. There is little coniferous reproduction in either the *Carex* meadows or the *Alnus sinuata-Salix* spp.-*Crataegus douglasii* thicket.

Adjacent to the meadows and situated on moist soil is the forest community dominated by *Abies amabilis-Abies grandis* (fig. 4). This community is the same as Society of American Foresters (SAF) cover type 226 Coastal True Fir-Hemlock (Eyre 1980). Mature specimens of *Abies amabilis,* up to 131 cm (51 in) in diameter at breast height (d.b.h.) and 52 m (171 ft) tall, are present. Mature *Abies grandis* as large as 166 cm (65 in) in d.b.h. and 55 m (180 ft) tall have been found here. Average d.b.h. for trees of both species is between 61 and 91 cm (24 and 36 in). Ring counts on two windthrown *Abies amabilis,* each with a stump diameter of 107 cm (42 in), revealed ages of 160 and 207 years. This old-growth stand presents a parklike appearance, with trees of all age classes, interspersed with numerous openings that are filled with herbaceous plants. One of these plants is *Frasera umpquaensis,* a candidate species for listing by the U.S. Fish and Wildlife Service (Meinke 1981). This southwest Oregon species is at the northern end of its range. Although most known populations of this *Frasera* species are very small, there are several hundred individuals here. Common plants in this forest type are *Achlys triphylla, Cornus canadensis, Linnaea borealis, Pedicularis racemosa,* and *Sidalcea cusickii.* Shrubby species that often form a dense tangle in the understory are *Acer circinatum, Berberis nervosa, Gaultheria shallon, Ribes lacustre,* and *Rhododendron macrophyllum.* Occasional large *Pseudotsuga menziesii* are present.

Figure 4.—The Abies amabilis-Abies grandis *forest at Upper Elk Meadows.*

The old-growth *Pseudotsuga menziesii*-dominated forest, SAF cover type 229 Pacific Douglas-Fir (Eyre 1980) (fig. 5), occupies the drier soil sites in the RNA. This is closed-canopy forest with trees 91 to 152 cm (36 to 60 in) in d.b.h.; the largest tree found was 243 cm (96 in) in d.b.h. and 43 m (170 ft) tall. The tallest tree was 56 m (184 ft). Ages of trees exceed 300 years, based on ring counts of stumps on adjacent clearcuts. Other large-size coniferous species present include *Abies amabilis* and *Tsuga heterophylla*. *Pinus monticola* occurs sparingly in this forest along the south boundary of the RNA. Mature *Pinus monticola* reach 97 cm (38 in) in d.b.h. and 49 m (161 ft) in height. Reproduction of *Abies* species is found over much of the area (fig. 6), from seedlings to saplings to poles. Common understory shrubs include *Acer circinatum*, *Gaultheria shallon*, *Rhododendron macrophyllum*, and *Vaccinium membranaceum*. At the driest locations *Xerophyllum tenax* is the major understory plant (fig. 7), whereas *Polystichum munitum*, *Achlys triphylla*, and *Vancouveria hexandra* are found throughout the rest of the area.

A basaltic outcrop and talus slope, 0.4 ha (1 acre) in size and nearly barren of vegetation, occurs at the southwestern corner of the RNA. At this xeric site two rock-loving species of ferns, *Cheilanthes gracillima* and *Cryptogramma crispa*, are found along with the shrub *Pachistima myrsinites*. Lichens cover the rocks. Nearby Rock Creek flows out of the RNA over a falls 12 m (39 ft) high. One plant, *Epilobium luteum*, usually found at higher elevations and not found elsewhere in the RNA, occurs here.

Figure 5.—View of old-growth Pseudotsuga menziesii *forest along the eastern boundary of Upper Elk Meadows Research Natural Area.*

Figure 6.—The dense, old-growth Pseudotsuga menziesii *forest with understory of* Abies *sp. saplings and poles at Upper Elk Meadows Research Natural Area.*

Figure 7.—At the driest sites in Upper Elk Meadows Research Natural Area a xeric plant community has developed under the Pseudotsuga menziesii *overstory. Here* Xerophyllum tenax *is the predominant species.*

Table 1 is a list of plants found in the RNA. Compilation of this list represents seven seasons of field investigations by BLM botanists.

Table 1—Plants in Upper Elk Meadows Research Natural Area[1]

Scientific name	Common name
Abies amabilis (Dougl.) Forbes	Pacific silver fir
Abies grandis (Dougl.) Forbes	Grand fir
Acer circinatum Pursh	Vine maple
Acer glabrum var. *douglasii* (Hook.) Dippel	Douglas' maple
Achillea millefolium L.	Common yarrow
Achlys triphylla (Smith) DC.	Vanillaleaf
Aconitum columbianum var. *howellii* (Nels. & Macbr.) Hitchc.	Columbian monkshood
Actaea rubra (Ait.) Willd.	Baneberry
Adenocaulon bicolor Hook.	Pathfinder
Agoseris aurantiaca (Hook.) Greene	Orange agoseris
Allotropa virgata T. & G.	Candystick
Alnus sinuata (Regel) Rydb.	Sitka alder
Amelanchier alnifolia Nutt.	Western serviceberry
Anagallis arvensis L.[2]	Scarlet pimpernel
Anaphalis margaritacea (L.) B. & H.	Pearly-everlasting
Anemone deltoidea Hook.	Threeleaf anemone
Anemone lyallii Britt.	Lyall's anemone
Angelica arguta Nutt.	Sharptooth angelica
Angelica genuflexa Nutt.	Kneeling angelica
Antennaria luzuloides T. & G.	Woodrush pussy-toes
Aquilegia formosa Fisch.	Sitka columbine
Arenaria macrophylla Hook.	Bigleaf sandwort
Arnica amplexicaulis Nutt.	Clasping arnica
Asarum caudatum Lindl.	Wild ginger
Aster foliaceus var. *parryi* (Eat.) Gray	Leafy aster
Aster modestus Lindl.	Fewflowered aster
Athyrium filix-femina (L.) Roth.	Lady-fern
Barbarea orthoceras Ledeb.	American wintercress
Berberis nervosa Pursh	Oregongrape
Botrychium multifidum (Gmel.) Trevis	Leathery grape-fern
Boykinia major Gray	Sierra boykinia
Bromus sitchensis Trin.	Alaska bromegrass
Calocedrus decurrens (Torr.) Florin	Incense-cedar
Calypso bulbosa (L.) Oakes.	Calypso orchid
Camassia leichtlinii (Baker) Wats.	Leichtlin's camas
Campanula scouleri Hook.	Scouler's bellflower
Cardamine pulcherrima var. *tenella* (Pursh) Hitchc.	Slender toothwort

See footnotes at end of table.

Table 1—Plants in Upper Elk Meadows Research Natural Area[1] (continued)

Scientific name	Common name
Carex luzulina Olney	Woodrush sedge
Carex vesicaria L.	Inflated sedge
Castanopsis chrysophylla (Dougl.) DC.	Golden chinquapin
Castilleja miniata Dougl.	Scarlet paintbrush
Cheilanthes gracillima D.C. Eat.	Lace lip-fern
Chimaphila menziesii (R. Br.) Spreng	Little prince's-pine
Chimaphila umbellata (L.) Bart.	Prince's-pine
Chrysanthemum leucanthemum L.[2]	Oxeye-daisy
Cicuta douglasii (DC.) Coult. & Rose	Western water-hemlock
Circaea alpina L.	Enchanter's nightshade
Cirsium arvense (L.) Scop.	Canada thistle
Cirsium vulgare (Savi) Tenore[2]	Bull thistle
Clintonia uniflora (Schult.) Kunth	Queen's cup
Collinsia parviflora Lindl.	Small-flowered blue-eyed-Mary
Collomia heterophylla Hook.	Varied-leaf collomia
Convolvulus nyctagineus Greene	Night-blooming morning-glory
Coptis laciniata Gray	Cutleaf goldthread
Corallorhiza maculata Ref.	Spotted coral-root
Corallorhiza mertensiana Bong.	Western coral-root
Cornus canadensis L.	Bunchberry
Cornus stolonifera var. *occidentalis* (T. & G.) Hitchc.	Red-osier dogwood
Crataegus douglasii Lindl.	Black hawthorn
Cryptogramma crispa (L.) R. Br.	Rock-brake
Delphinium menziesii DC.	Menzies' larkspur
Dicentra formosa (Andr.) Walp.	Pacific bleedingheart
Disporum hookeri (Torr.) Nicholson	Hooker fairy-bell
Dryopteris austriaca (Jacq.) Woynar	Mountain wood-fern
Elymus glaucus Buckl.	Blue wildrye
Epilobium angustifolium L.	Fire weed
Epilobium glandulosum Lehm. var. *glandulosum*	Willow-weed
Epilobium glandulosum Lehm. var. *macounii* (Trel.) Hitchc.	Willow-weed
Epilobium latifolium L.	Red willow-weed
Epilobium luteum Pursh	Yellow willow-weed
Epilobium watsonii var. *watsonii* Barbey	Watson's willow-weed
Equisetum arvense L.	Common horsetail
Erigeron aliceae Howell	Alice fleabane
Eriophyllum lanatum (Pursh) Forbes	Woolly sunflower
Erythronium grandiflorum Pursh *var. grandiflorum*	Pale fawn-lily

See footnotes at end of table.

Table 1—Plants in Upper Elk Meadows Research Natural Area[1] (continued)

Scientific name	Common name
Erythronium oregonum Applegate	Giant fawn-lily
Festuca occidentalis Hook.	Western fescue
Fragaria vesca L.	Woods strawberry
Frasera umpquaensis (Peck & Appleg.)[3]	Umpqua swertia
Galium aparine L.	Bedstraw
Galium oreganum Britt.	Oregon bedstraw
Gaultheria ovatifolia Gray	Oregon wintergreen
Gaultheria shallon Pursh	Salal
Glyceria elata (Nash) Jones	Tall mannagrass
Goodyera oblongifolia Raf.	Rattlesnake-plantain
Habenaria dilatata (Pursh) Hook.	White bog-orchid
Habenaria saccata Greene	Slender bog-orchid
Heracleum lanatum Michx.	Cow-parsnip
Hieracium albiflorum Hook.	White-flowered hawkweed
Hydrophyllum occidentale (Wats.) Gray	Western waterleaf
Hydrophyllum tenuipes Heller	Pacific waterleaf
Hypericum anagalloides C. & S.	Bog St. Johns-wort
Hypericum perforatum L.[2]	Common St. Johns-wort
Hypopitys monotropa Crantz	Pinesap
Iris chrysophylla Howell	Slender-tubed iris
Juncus ensifolius Wikst.	Dagger-leaf rush
Lactuca muralis (L.) Fresen	Wall lettuce
Lathyrus nevadensis var. *pilosellus* (Peck) Hitchc.	Peavine
Lathyrus polyphyllus Nutt.	Leafy peavine
Lilium columbianum Hanson	Tiger lily
Lilium washingtonianum Kell.	Washington lily
Linnaea borealis L.	Twinflower
Listera caurina Piper	Western twayblade
Lomatium martindalei Coult. & Rose	Few-flowered lomatium
Lonicera ciliosa (Pursh) DC.	Orange honeysuckle
Lonicera involucrata (Rich.) Banks	Black twin-berry
Lotus formosissimus Greene	Seaside lotus
Lotus nevadensis (Wats.) Greene	Nevada deervetch
Lotus pinnatus Hook.	Meadow deervetch
Lupinus latifolius Agardh	Broadleaf lupine
Luzula campestris (L.) DC.	Field woodrush
Microsteris gracilis var. *gracilis* (Hook.) Greene	Pink microsteris
Mimulus guttatus DC.	Yellow monkey-flower

See footnotes at end of table.

Table 1—Plants in Upper Elk Meadows Research Natural Area[1] (continued)

Scientific name	Common name
Mitella caulescens Nutt.	Leafy mitrewort
Mitella ovalis Greene	Oval-leaved mitrewort
Montia parvifolia (Moc.) Greene	Littleleaf montia
Montia sibirica (L.) Howell	Western springbeauty
Nemophila parviflora Dougl.	Smallflowered nemophila
Osmorhiza chilensis H. & A.	Mountain sweet-root
Oxalis oregana Nutt.	Oregon oxalis
Pachistima myrsinites (Pursh) Raf.	Oregon boxwood
Pedicularis racemosa Dougl.	Sickletop lousewort
Penstemon cardwellii Howell	Cardwell's penstemon
Penstemon Rattanii Gray[3]	Rattan's penstemon
Perideridia gairdneri (H. & A.) Math.	Gairdner's yampah
Phacelia linearis (Pursh) Holz.	Threadleaf phacelia
Phacelia nemoralis Greene	Woodland phacelia
Pheleum pratense L.[2]	Timothy
Pinus monticola Dougl.	Western white pine
Pleuricospora fimbriolata Gray	Fringed-pinesap
Polemonium carneum Gray	Great polemonium
Polygonum bistortoides Pursh	American bistort
Polygonum minimum Wats.	Broadleaf knotweed
Polystichum munitum (Kaulf.) Presl	Sword-fern
Populus trichocarpa T. & G.	Black cottonwood
Potentilla arguta Pursh	Tall cinquefoil
Potentilla glandulosa Lindl.	Sticky cinquefoil
Prunella vulgaris L.[2]	Self-heal
Prunus emarginata (Dougl.) Walp.	Bitter cherry
Pseudotsuga menziesii (Mirb.) Franco	Douglas-fir
Pteridium aquilinum (L.) Kuhn.	Bracken fern
Pyrola asarifolia Michx.	Alpine pyrola
Pyrola picta Smith	White-vein pyrola
Pyrola secunda L.	One-sided wintergreen
Pyrus fusca Raf.	Western crabapple
Ranunculus uncinatus D. Don	Little buttercup
Rhamnus purshiana DC.	Cascara
Rhododendron macrophyllum G. Don	Pacific rhododendron
Ribes binominatum Hel.[3]	Siskiyou gooseberry
Ribes bracteosum Dougl.	Stink currant
Ribes lacustre (Pers.) Poir.	Prickly currant
Ribes sanguineum Pursh	Red-flowered currant
Rosa gymnocarpa Nutt.	Baldhip rose
Rubus lasiococcus Gray	Dwarf bramble
Rubus leucodermis Dougl.	Blackcap

See footnotes at end of table.

Table 1—Plants in Upper Elk Meadows Research Natural Area[1] (continued)

Scientific name	Common name
Rubus parviflorus Nutt.	Thimbleberry
Rubus spectabilis Pursh	Salmonberry
Rubus ursinus Cham. & Schlecht.	Pacific blackberry
Rudbeckia occidentalis Nutt.	Black head
Rumex acetosella L.[2]	Sheep sorrel
Rumex occidentalis var. *procerus* (Greene) Howell	Western dock
Salix geyeriana Anderss.	Geyer willow
Salix scouleriana Barratt	Scouler willow
Sambucus cerulea Raf.	Blue elderberry
Sambucus racemosa var. *arborescens* (T. & G.) Gray	Red elderberry
Saxifraga bronchialis L. var. *vespertina* (Small) Rosend.[4]	Matted saxifrage
Scirpus microcarpus Presl	Small-fruited bulrush
Senecio jacobaea L.[2]	Tansy ragwort
Senecio sylvaticus L.[2]	Wood groundsel
Senecio triangularis Hook.	Arrowleaf groundsel
Sidalcea cusickii Piper	Cusick's sidalcea
Smilacina racemosa (L.) Desf.	False Solomons-seal
Smilacina stellata (L.) Desf.	Star-flowered Solomon-plume
Sorbus sitchensis Roemer	Sitka mountain-ash
Spiranthes romanzoffiana Cham.	Ladies-tresses
Stachys cooleyae Heller	Cooley's hedge-nettle
Stachys palustris L.	Swamp hedge-nettle
Stellaria calycantha (Ledeb.) Bong.	Northern starwort
Streptopus amplexifolius var. *americanus* (L.) DC.	Clasping-leaved twisted-stalk
Symphoricarpos albus (L.) Blake	Common snowberry
Synthyris reniformis (Dougl.) Benth.	Snow-queen
Taxus brevifolia Nutt.	Pacific yew
Thalictrum occidentale Gray	Western meadowrue
Thuja plicata Donn.	Western redcedar
Tiarella trifoliata var. *unifoliata* (Hook.) Kurtz.	Coolwort foamflower
Trautvetteria caroliniensis (Walt.) Vail.	False bugbane
Trientalis latifolia Hook.	Western starflower
Trifolium howellii Wats.	Bigleaf clover
Trillium ovatum Pursh	Trillium
Tsuga heterophylla (Raf.) Sarg.	Western hemlock
Urtica dioica L.	Stinging nettle
Vaccinium membranaceum Dougl.	Big huckleberry
Vaccinium parvifolium Smith	Red huckleberry
Vancouveria hexandra (Hook.) Morr. & Dec.	White inside-out-flower

See footnotes at end of table.

Table 1—Plants in Upper Elk Meadows Research Natural Area[1] (continued)

Scientific name	Common name
Veronica serpyllifolia var. *humifusa* (Dickson) Vahl	Thyme-leaved speedwell
Vicia americana var. *villosa* (Kell.) Hermann	American vetch
Viola glabella Nutt.	Stream violet
Viola sempervirens Greene	Evergreen violet
Xerophyllum tenax (Pursh) Nutt.	Beargrass

[1] Nomenclature follows Hitchcock and Cronquist (1976). Information supplied by Alan B. Curtis, forester/botanist, U.S. Department of the Interior, Bureau of Land Management, Eugene, Oregon, and John Christy, botanist, formerly with Bureau of Land Management, Eugene, Oregon.

[2] Introduced species.

[3] Nomenclature follows Peck (1961).

[4] Found north of RNA boundary.

Fauna

The combination of timber types, meadows, and talus slopes provides diverse wildlife habitat.

A list of reptiles and amphibians believed to inhabit the RNA is found in table 2. Birds in the RNA are listed in table 3, mammals in table 4. There are no signs of beaver *(Castor canadensis)* activity now or in the past at the RNA.

Table 2—Reptiles and amphibians in Upper Elk Meadows Research Natural Area[1]

Order	Scientific name	Common name
Anura	*Bufo boreas*	Western toad
	Hyla regilla	Pacific treefrog
	Rana boyli	Foothill yellow-legged frog
	Rana cascadae	Cascades frog
Caudata	*Ambystoma gracile*	Northwestern salamander
	Dicamptodon ensatus	Pacific giant salamander
	Plethodon dunni	Dunn's salamander
	Rhyacotriton olympicus	Olympic salamander
	Taricha granulosa	Roughskin newt
Squamata	* *Gerrhonotus coeruleus*	Northern alligator lizard
	Thamnophis elegans	Western terrestrial garter snake
	Thamnophis sirtalis	Common garter snake

[1] Nomenclature follows Collins et al. (1978). Reptiles and amphibians listed are believed to use the area at some time of year. Information supplied by Charles Thomas, wildlife biologist, U.S. Department of the Interior, Bureau of Land Management, Eugene, Oregon.

*Indicates presence verified by sight, sound, or sign.

Table 3—Birds in Upper Elk Meadows Research Natural Area[1]

Order	Scientific name	Common name
Falconiformes	*Accipiter cooperii*	Cooper's hawk
	Accipiter gentilis	Goshawk
	Accipiter striatus	Sharp-shinned hawk
	* *Buteo jamaicensis*	Red-tailed hawk
	* *Cathartes aura*	Turkey vulture
Galliformes	*Bonasa umbellus*	Ruffed grouse
	* *Dendragapus obscurus*	Blue grouse
Columbiformes	* *Columba fasciata*	Band-tailed pigeon
Strigiformes	*Aegolius acadicus*	Saw-whet owl
	Bubo virginianus	Great horned owl
	* *Glaucidium gnoma*	Pygmy owl
	* *Strix occidentalis*	Spotted owl
Apodiformes	*Chaetura vauxi*	Vaux's swift
	* *Selasphorus rufus*	Rufous hummingbird
	Stellula calliope	Calliope hummingbird
Piciformes	* *Colaptes auratus*	Common flicker
	* *Dendrocopos villosus*	Hairy woodpecker
	* *Dryocopus pileatus*	Pileated woodpecker
	* *Sphyrapicus varius*	Yellow-bellied sapsucker
Passeriformes	**Carpodacus cassinii*	Cassin's finch
	**Catharus guttata*	Hermit thrush
	**Certhia familiaris*	Brown creeper
	**Corvus branchyrhynchos*	American crow
	**Corvus corax*	Common raven
	**Cyonocitta stelleri*	Steller's jay
	**Dendroica coronata*	Yellow-rumped warbler
	**Dendroica occidentalis*	Hermit warbler
	**Dendroica townsendi*	Townsend's warbler
	**Empidonax hammondi*	Hammond's flycatcher
	Empidonax oberhalseri	Dusky flycatcher
	**Hesperiphona vespertina*	Evening grosbeak
	**Ixoreus naevius*	Varied thrush
	**Junco hyemalis*	Dark-eyed junco
	**Loxia curvirostra*	Red crossbill
	**Melospiza lincolnii*	Lincoln's sparrow[2]
	**Melospiza melodia*	Song sparrow
	**Nuttallornis borealis*	Olive-sided flycatcher
	**Parus gambeli*	Mountain chickadee

See footnotes at end of table.

Table 3—Birds in Upper Elk Meadows Research Natural Area[1] (continued)

Order	Scientific name	Common name
Passeriformes (continued)	**Parus rufescens*	Chestnut-backed chickadee
	**Perisoreus canadensis*	Gray jay
	**Piranga ludoviciana*	Western tanager
	**Regulus calendula*	Ruby-crowned kinglet
	**Regulus satrapa*	Golden-crowned kinglet
	**Sitta canadensis*	Red-breasted nuthatch
	**Spinus pinus*	Pine siskin
	**Troglodytes troglodytes*	Winter wren
	**Turdus migratorius*	Robin
	Vireo huttoni	Hutton's vireo
	**Wilsonia pusilla*	Wilson's warbler

[1] Nomenclature follows Bertrand and Scott (1979). Birds listed are believed to use the area at some time of year. Information supplied by Charles Thomas, wildlife biologist, U.S. Department of the Interior, Bureau of Land Management, Eugene, Oregon.

[2] Possible disjunct population, or at least a western extreme for this species.

*Indicates presence verified by sight or sound.

Table 4—Mammals in Upper Elk Meadows Research Natural Area[1]

Order	Scientific name	Common name
Marsupialia	*Didelphis virginiana*	Common opossum
Insectivora	*Neurotrichus gibbsii*	Shrew-mole
	Scapanus orarius	Pacific Coast mole
	Sorex bendirii	Pacific shrew
	Sorex trowbridgii	Trowbridge's shrew
	Sorex vagrans	Vagrant shrew
Chiroptera	*Antrozous pallidus*	Pallid bat
	Eptesicus fuscus	Big brown bat
	Lasionycteris noctivagans	Silver-haired bat
	Lasiurus cinereus	Hoary bat
	Myotis californicus	California myotis
	Myotis evotis	Long-eared myotis
	Myotis lucifugus	Little brown myotis
	Myotis thysanodes	Fringed myotis
	Myotis volans	Long-legged myotis
	Myotis yumanensis	Yuma myotis
	Plecotus townsendii	Townsend's big-eared bat

See footnotes at end of table.

Table 4—Mammals in Upper Elk Meadows Research Natural Area[1] (continued)

Order	Scientific name	Common name
Lagomorpha	*Lepus americanus*	Snowshoe hare
	Ochotona princeps	Pika
Rodentia	**Aplodontia rufa*	Mountain beaver
	Arborimus longicaudus	Red tree vole
	Clethrionomys californicus	California red-backed vole
	Erethizon dorsatum	Porcupine
	Eutamias townsendii	Townsend's chipmunk
	Glaucomys sabrinus	Northern flying squirrel
	Microtus longicaudus	Long-tailed vole
	Microtus oregoni	Oregon vole
	Microtus townsendii	Townsend's vole
	Neotoma cinerea	Bushy-tailed woodrat
	**Peromyscus maniculatus*	Deer mouse
	**Tamiasciurus douglasii*	Chickaree
	Thomomys mazama	Mazama pocket gopher
	Zapus trinotatus	Pacific jumping mouse
Carnivora	*Canis latrans*	Coyote
	Cervus elaphus	Roosevelt elk
	Felis concolor	Mountain lion
	Felis rufus	Bobcat
	Martes americana	Marten
	Martes pennanti	Fisher
	Mustela erminea	Shorttail weasel
	Mustela frenata	Long-tailed weasel
	Mustela vison	Mink
	**Odocoileus hemionus*	Blacktail deer
	**Procyon lotor*	Raccoon
	Spilogale putorius	Spotted skunk
	Urocyon cinereoargenteus	Gray fox
	**Ursus americanus*	Black bear

[1] Nomenclature follows Jones et al. (1975). Mammals listed are believed to use the area at some time of year. Information supplied by Charles Thomas, wildlife biologist, U.S. Department of the Interior, Bureau of Land Management, Eugene, Oregon.

*Indicates presence verified by sight, sound, or sign.

Research

No research studies are known to be in progress on the RNA. The area is suitable for studying succession of plant communities and wildlife use of midelevation wet meadows and adjacent forests; it is an excellent site for studying the invasion of shrubby species into open, wet meadows. It is believed that this invasion was once held in check through browsing by big game species (deer and elk). Now, because a network of roads has been built (providing hunter access) and extensive adjacent areas have been clearcut (allowing herbaceous forage plants to grow where only dense forests previously existed), big game is seldom seen in natural openings at Upper Elk Meadows.

Maps and Aerial Photographs

The map applicable to Upper Elk Meadows RNA is: **Topographic**—Culp Creek, Oregon, quadrangle, scale 1:62,500, issued by the U.S. Geological Survey in 1955; **Geologic**—Reconnaissance Geologic Map and Sections of the Western Cascade Range, Oregon, north of latitude 43° N. (Peck 1964). The Bureau of Land Management, Eugene District Office, can supply information on the most recent aerial photos and forest type maps for the area.

History of Disturbance

There is no evidence of wildfire having occurred within Upper Elk Meadows RNA. It is doubtful that domestic livestock have grazed in the meadows.

During the 1860's miners opened a trail (later improved to a road) along the Calapooya Divide, and the springs of Upper Elk Meadows were a favorite camping site. Today a rock-surfaced logging road (BLM road No. 23-2-35.1) lies at the approximate location of the earlier road.

In the early 1970's timber was cut from a large area, including 8.5 ha (21 acres) now inside the RNA boundary. A shelterwood system was designed to favor natural reproduction, and seed trees were left standing for an additional 4 years. Natural reproduction appeared sparse, so the area was planted in 1976 and again in 1980 with *Pseudotsuga menziesii* seedlings. The dominant herbaceous plant in the cutover area at this time (early 1980's) is *Epilobium angustifolium*. Very little *Cirsium arvense* or *Senecio jacobaea* has invaded the area.

In 1983 new blowdown was removed where it blocked the road just to the west of the cutover area.

The balsam woolly aphid *(Chermes piceae)* has infected mature *Abies* spp. and has killed some of the overstory. As early as 1969, *Abies* spp. understory trees showed typical symptoms of light infestation by balsam woolly aphid.[6]

Many mature *Pinus monticola* have died within the last 10 years. The cause of death is believed to be from infection by white pine blister rust, *Cronartium ribicola*.

The forest at Upper Elk Meadows RNA is susceptible to windthrow. The south boundary is particularly vulnerable because the adjacent timber on private land has been cut. The hard winter conditions of 1981-82 resulted in blowdown of mature timber at several locations in the RNA.

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[6] Letter on file at Eugene District Office, Bureau of Land Management, November 20, 1969, from USDA Forest Service, Forestry Sciences Laboratory, Corvallis, Oregon.

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