Federal Research Natural Areas in Oregon and Washington A Guidebook for Scientists and Educators. 1972. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

WILDCAT MOUNTAIN RESEARCH NATURAL AREA [1]

Stands of noble fir and associated species on mountain slopes and ridgetops in the western Cascade Range of Oregon.

The Wildcat Mountain Research Natural Area was established on March 18, 1968, to preserve prime examples of noble fir *(Abies procera)* stands as they occur on mountain ridges in the western Cascades of Oregon. The 405-ha. (1,OOO-acre) tract is located in Linn County, Oregon, and is administered by the McKenzie Bridge Ranger District (McKenzie Bridge, Oregon), Willamette National Forest. The tract occupies portions of sections 17, 20, 21, 22, 27, and 28, T. 14 S., R. 6 E., Willamette meridian (fig. WM-1). The southern boundary is marked by Forest Road 147 and the dividing ridge between Browder and Bunchgrass Creeks (fig. WM-1). The northern boundary is based on various natural features used either directly or as control points. It lies at 44°20' N. latitude and 122°06' W. longitude.

ACCESS AND ACCOMMODATIONS

It is easiest to approach the vicinity from either the north (Albany and Sweet Home), using U.S. Highway 20, or from the south (Eugene) using U.S. Highway 126. From U.S. Highway 20, turn south just west of Tombstone Summit onto Forest Road 1345 and follow it to Forest Road 147 and the natural area. From U.S. Highway 126, turn north onto Forest Road 1645 (about 14 km. or 9 miles east of McKenzie Bridge Ranger Station). The natural area can be reached via this and Forest Road 1345 or via Forest Road 147 which leaves Forest Road 1645 about 2.4 km. (1.5 miles) north of U.S. Highway 126.

Forest Road 147 provides access to most of the southern edge of the natural area, and the abandoned Wildcat Mountain trail traverses the western half, terminating at the summit of the mountain.

ENVIRONMENT

The Wildcat Mountain Research Natural Area extends across the summit ridge of Wildcat Mountain onto the north slope of Bunchgrass Mountain (fig. WM-1). Elevations range from about 1,160 m. (3,800 ft.) in the bottom of a drainage in section 22 to 1,632 m. (5,353 ft.) at the summit of Wildcat Mountain. Several distinctive topographic units can be recognized: (1) the southwest face of Wildcat Mountain which has moderate (20- to 40-percent) slopes at its base and increasingly steeper (50- to 70-percent) gradients near the summit; (2) the north face of Wildcat Mountain which is largely steep or precipitous (50- to over 100-percent slopes) and has frequent rock outcrops; and (3) two drainages on the north slope of Bunchgrass Mountain and associated ridges which have steep (30 to 80 percent) but generally not precipitous slopes.

The natural area lies within a geologically older (Eocene to Miocene) part of the Cascade Range known as the western Cascades. A current geologic map indicates the tract is located on "volcanic rocks of the High Cascade Range" which were intruded in the Pliocene and Pleistocene, i.e., the formation

[1] Description prepared by Dr. J. F. Franklin and Dr. C. T. Dyrness, U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Forestry Sciences Laboratory, Corvallis, Oregon.

commonly known as the High Cascade Andesites (Peck et a1. 1964). However, recent studies indicate that" ... these areas of 'High Cascade' rocks which have been mapped within the Western Cascade Province are not to be associated in time or in place of origin with High Cascade volcanism." (Taylor 1968). Topographically the natural area is certainly consistent with the deeply eroded character of the western Cascades, and it lies several kilometers west of the recognized boundary (approximately the McKenzie River) between the western and high Cascades.

The dominant rock type is andesite. V 01canic tuffs, breccias, and possibly, intrusive plugs and dikes also occur in the area. Peck et a1. (1964) have provided some data on the lithology and petrography of the volcanic bedrock. Residual materials are covered with aeolian deposits of volcanic ash except where the ash has been removed by erosion. The source and age of the ash deposits are unknown, but there are many possible vents in adjacent parts of the high Cascades (Taylor 1968).

The wet, cool climate of the natural area is typical of subalpine areas in the Cascade Range. Precipitation is heaviest during the winter months (November through March); only 4 to 5 percent occurs during the summer (June through August). About half of the precipitation occurs as snow and accumulates in winter snowpacks which reach maximum depths of 2 to 3 m. (70 to 120 in.) between February and March. The peak of snowmelt typically occurs in May and is completed by June or early July. There are no nearby climatic stations which provide useful climatic indices for the natural area. However, headquarters of the U.S. Army Corps of Engineers' Willamette Basin Snow Laboratory was located in the pass between Squaw and Wildcat Mountains, about 1 km. (0.5 mile) west of the natural area. Between 1947 and 1951, this laboratory collected data on general climate, snow hydrology, stream-flow, etc., in the Blue River drainage. The following data are average values computed for this drainage (U.S. Army Corps of Engineers North Pacific Division 1956):

Mean annual temperature	7.2°C. (45.0°F.)
Mean January temperature	0.0°C. (32.0°F.)
Mean July temperature	16.7°C. (62.0°F.)
Average annual precipitation	3,188 mm. (125.5 in.)
June through August precipitation	127 mm. (5.0 in.)
Snowfall (water equivalent)	174 cm. (68.5 in.)

Since the mean elevation for the basin under study is 1,045 m. (3,430 ft.), temperatures are lower on the natural area and precipitation is higher; an isohyetal map suggests 3,810 to 4,065 mm. (150 to 160 in.) of annual precipitation on the natural area (U.S. Army Corps of Engineers North Pacific Division 1956). The numerous data collected at the Willamette Basin Snow Laboratory are summarized in "Snow Hydrology: Summary Report of the Snow Investigations" (U .S. Army Corps of Engineers North Pacific Division 1956) and are on file at the division office in Portland, Oregon.

Soils in the area are poorly developed Brown Podzolics. In some locations it is difficult to discern any profile development. Generally, however, the surface 15 to 30 cm. (6 to 12 in.) of soil is a weakly expressed B2ir horizon comprised of dark brown, very friable loam or sandy loam with weak subangular blocky structure. This soil material can be described as "fluffy" and is always of very low bulk density. Soil texture usually shows little variation throughout the profile. Stone content increases with depth and often reaches 50 to 60 percent by volume at 45 to 60 cm. (17.71 to 23.62 in.). Despite abundant andesite fragments in the profile these soils are apparently largely derived from aeolian deposits of volcanic ash. Forest floor thickness ranges from 4 to 8 cm. (1.5 to 3 in.) and is occasionally underlain by a very thin, discontinuous A2 horizon.

BIOTA

Approximately 288 ha. (710 acres) of the Wildcat Mountain Research Natural Area are forested. A detailed breakdown of this area by National Forest inventory type, SAF cover type (Society of American Foresters 1954), composition, and age class is provided

in table WM-1. Areas of SAF cover types can be summarized as follows: [2]

No.	*Name*	*Area*
226	Pacific Silver Fir-Hemlock (noble fir-dominated)	209 ha. (517 acres)
226	Pacific Silver Fir-Hemlock (Pacific silver fir-dominated)	38 ha. (95 acres)
205	Mountain Hemlock-Subalpine Fir	22 ha. (55 acres)
230	Douglas-Fir-Western Hemlock	17 ha. (43 acres)

There are 117 ha. (289 acres) of non-forested lands within the natural area, which include rocky cliffs, meadows of various types, and brushfields (fig. WM-2). Kuchler (1964) types represented include Silver Fir-Douglas Fir Forest (3) and Fir-Hemlock Forest (4). Most of the natural area lies within the *Abies amabilis* Zone; the *Tsuga mertensiana* Zone is represented at higher elevations (Franklin and Dyrness 1969).

The most important and nearly ubiquitous tree species in the natural area is noble fir. Pure,130-year-old stands located in the southwestern quarter and 300-year-old stands in the eastern third of the natural area provide excellent examples of this species. Pacific silver fir *(Abies amabilis),* Douglas-fir *(Pseudotsuga menziesii),* and mountain hemlock *(Tsuga mertensiana)* are common associates. Pacific silver fir is absent from the overstory in some of the pure noble fir stands but is present everywhere as seedlings and saplings; in a few stands at highest elevations Pacific silver fir and mountain hemlock are the only species present. Douglas-fir is most abundant in the drainage in section 22 and is nearly absent at higher elevations. Some of the 130year-old stands contain residual 450-year-old Douglas-fir specimens which survived the destruction of the previous stand; young, 130-year-old Douglas-firs in such stands are generally subordinate in the crown canopy to dominant noble firs.

Other tree species present within the natural area are western white pine *(Pinus monticola),* Alaska-cedar *(Chamaecyparis nootkatensis),* and western hemlock *(Tsuga heterophylla).* The pine is scattered throughout the area, but much of it is presently dead or dying from attacks by bark beetles and white pine blister rust. Alaska-cedar is generally found on rocky habitats along the ridgetops and around some meadow areas. Western hemlock is essentially confined to lower elevations.

Mensurational data have been collected only from the younger forest stands in the natural area. Dominant noble fir in the highly productive southwestern part of the natural area average 75- to 100-cm. (30- to 40-in.) d.b.h. and 50 to 55 m. (160 to 180 ft.) tall. Ring counts on roadside stumps indicate a range in age from 120 to 137 years; these data substantiate the age class recognized in the 1960 inventory. Douglas-fir of the same age in these stands average 15 to 30 cm. (6 to 12 in.) smaller in diameter and 2 to 5 m. (5 to 15 ft.) shorter than the dominant noble firs. The scattered old-growth Douglas-firs are commonly 125- to 150-cm. (50- to 60-in.) d.b.h. and about 450 years old. Dominant Pacific silver fir and mountain hemlock stands growing on poorer sites average 30- to 60-cm. (12- to 24-in.) d.b.h. and 30 to 35 m. (l00 to 120 ft.) tall at 120 to 130 years. Trees found in stands over 130 years of age are, of course, larger in size, given comparable site conditions. Maximum diameters observed to date are 186.7 cm. (73.5 in.) at b.h. for noble fir and 91.4 cm. (36.0 in.) b.h. for Pacific silver fir.

Based on size class distributions, successional trends apparently favor gradual replacement of most forest tree species by Pacific silver fir. The degree to which successional processes have advanced varies greatly, especially with stand age, but the trend in compositional changes is generally clear. For example, Pacific silver fir seedlings and saplings are abundant in many of the young (130-year-old), pure noble fir stands; but there are relatively few specimens of any

[2] Assignment of some forest stands in this area to SAF cover types was, in part, arbitrary due to inadequacies in the type definitions (Society of American Foresters 1954). Mixtures of Pacific silver fir and mountain hemlock were assigned to types 226 or 205 based on the relative importance of the two species. All areas dominated by noble fir or a mixture of Douglas-fir and noble fir were assigned to type 226.

species in intermediate size classes. In older stands, Pacific silver fir commonly dominates both seedling and intermediate size classes (fig. WM-3). Pacific silver fir seedlings and saplings are also much more abundant than those of mountain hemlock in mixed stands of these species. In general, noble fir is failing to reproduce within closed forest stands; however, seedlings are abundant on the forest floor after a good seed year and may persist for several years before dying. Mountain hemlock and Douglas-fir also appear ineffectual in reproducing themselves in forest stands.

At least four major forest communities can be recognized within the natural area based on the limited sampling thus far: *Abies procera/Clintonia uniflora, Abies procera/Achlys triphylla, Tsuga mertensiana - Abies amabilis/Xerophyllum tenax,* and *Abies amabilis/Vaccinium membranaceum - Xerophyllum* tenax.[3]

The *Abies procera/Clintonia uniflora* community is found on productive, relatively mesic sites. It is characterized by a herb-rich understory which averages 40- to 45-percent canopy coverage; in some dense stands the coverage is much less (fig. WM-3). Typical species include *Achlys triphylla, Anemone deltoidea, Chimaphila menziesii,* C. *umbellata, Clintonia uniflora, Cornus canadensis, Galiuim oreganum, Pyrola picta, P. secunda, Pteridium aquilinum, Rubus lasiococcus, Smilacina sessilifolia, Tiarella uifoliata, Viola glabella,* and *V. sempervirens. Cornus, Smilacina,* and *Clintonia* usually have the highest coverage of herbaceous species. *Vaccinium membranaceum* has high constancy, but its coverage is relatively low (1 to 15 percent).

Abies procera/Achlys triphylla communities are found on somewhat poorer sites, e.g., areas of shallower soil. Vine maple *(Acer circinatum)* is usually a conspicuous shrubby element in stands of this type. *Vaccinium membranaceum* is also present but has low coverage. The herbaceous layer can be relatively well developed and typically includes *Achlys triphylla, Pyrola secunda, Pteridium aquilinum, Smilacina sessilifolia, Galium oreganum, Viola glabella,* and *V. sempervirens.* The *Achlys* and *Smilacina* normally have the highest herbaceous coverage.

The *Tsuga mertensiana-Abies amabilis/ Xerophyllum tenax* community is typical of the poorest forested habitats, i.e., sites with the shortest, coolest growing seasons and shallow soils. Only two species are important in the understory - *Xerophyllum tenax* and *Vaccinium rnembranaceum.* The liliaceous *Xerophyllum* completely dominates with canopy coverage of up to 90 percent (fig. WM-3).

A fourth forest community, the *Abies amabilis/ Vaccinium membranaceum-Xerophyllum. tenax,* is at least sporadically represented in the natural area. It is intermediate in character between the *Tsuga-Abies/Xerophyllum* and the *Abies/Achlys* types with significant coverage of *Vaccinium membranaceum, Xerophyllum tenax,* and several herbs.

There are also a variety of non-forested communities in the Wildcat Mountain Research Natural Area. These include: (1) communities on logged and burned forest land, (2) meadows of various types, (3) shrub communities, and (4) communities associated with rock outcrops and cliffs. Small portions of areas clear-cut and broadcast burned in 1952 (in section 20) and 1967 (in sections 21 and 28) were incorporated into the natural area. The seral communities present on these areas are typical of early stages in secondary succession on forest habitats. Shrubs (e.g., *Ceanothus velutinus)* dominate on the older (more advanced) clear-cut and herbs on the other. Natural regeneration of conifers is appearing in both.

The meadow communities in the natural area can largely be related to the Wet Meadow, Mesic Meadow, and Subalpine Xeric Meadow types recognized by Hickman (1968) in comparable portions of the western Cascades. The Wet Meadow type is generally found on gentle slopes where a relatively

[3] These are vegetation units which have been recognized in a classification of forest communities in the western Cascades of Oregon. Details are available from Dr. C. T. Dyrness, U.S. Forest Service, Forestry Sciences Laboratory, Corvallis, Oregon.

deep, organic soil has developed; it is relatively rare in the natural area, occurring most frequently adjacent to Sitka alder *(Alnus sinuata.)* thickets. Typical dominants are *Veratrum viride, Senecio triangularis,* and *Valeriana sitchensis.* The Mesic Meadow type occupies habitats where moisture is typically adequate until midsummer. Dominants are *Rubus parviflorus, Pteridium aquilinum,* and *Rudbeckia occidentalis.* There are many associated herbaceous perennials, e.g., *Erigeron aliceae, Lupinus latifolius, Polygonum phytolaccaefolium, Cirsium centaurea,* and *Vicia americana* var. *truncata,* and occasional ephemeral annuals, e.g., *Gayophytum humile.* This type of meadow is probably the most extensive within the natural area. In some locations, invasion of trees, especially noble fir, is taking place; in others, there is no evidence for such successional changes, and the meadow community appears stable. Subalpine Xeric Meadows occur on sites with shallow, rocky soils where moisture becomes critical relatively early in the growing season. Representative species are *Gilia aggregata, Gayophytum diffusum.* var. *parviflorum, Orthocarpus imbricatus, Polygonum douglasii, Navarretia divaricata, Microsteris gracilis, Collinsia parviflora, Cerastium arvense,* and *Rumex acetosella.*

Wet sites adjacent to the meadows and forest, steep, north-facing slopes on Wildcat Mountain, and talus associated with rock outcrops are occupied by shrub communities. Sitka alder is the typical dominant on wetter substrates and steep north slopes forming dense thickets. Deep winter snow accumulations and extensive snow creep cause strong bowing of the 3- to 5-m.-(10- to 16-ft.-) tall alder stems. In a nearby area, the occurrence of these stands has been related to high soil water tables due to a nearly impervious subsoil[4], while in other regions they are associated with recurrent avalanches; both factors are probably operative on the natural area. Vine maple dominates the shrub communities occupying relatively dry talus; these intergrade, in some cases, with Sitka alder communities which may be found on moister portions of the same talus patch. Both types of shrub communities appear to be stable community types as there is generally no evidence of encroachment by tree species.

The communities found on rock outcrops and cliffs have not been examined. The species present undoubtedly include many of those listed by Hickman (1968) for the Outcrop Ridge and Vertical Outcrop habitats recognized in his floristic study of the western Cascades. The Outcrop Ridge habitat is found on south- and west-facing slopes, where mass wasting of small fragments has produced small outcrops of barely exposed parent rock eroded parallel to the general slope of the area. Many species root in weathered cracks or pockets of finer material, including *Delphinium menziesii* var. *pyramidale, Castilleja hispida, Penstemon procerus* var. *brachyanthus, Sedum stenopetalum* and *S. divergens, Eriophyllum lanatum, Arctostaphylos nevadensis, Comandra umbellata, Lomatium martindalei, Sanicula graveolens, Eriogonum compositum, Juniperus communis, Erigeron foliosus* var. *confinis, Arenaria capillaris* var. *americana, Erysimum asperum,* and *Phacelia heterophylla.* Species such as *Saxifraga bonchialis* var. *vespertina* and *Penstemon rupicola* are typical of the exposed Vertical Outcrop habitat.

Mammals believed to utilize the natural area as residents or transients are listed in table WM-2.

The only specialized habitats known to occur on the natural area, which have not already been mentioned, are the live stream and streamside areas.

HISTORY OF DISTURBANCE

Within the core of the natural area there has been some human disturbance. Minor disturbance was associated with construction and maintenance of the Wildcat Mountain trail and fire lookout. A small forest opening was created at the mountain summit when the lookout was built. The building was

[4] Unpublished soil survey data from the H. J. Andrews Experimental Forest, on file at U.S. Forest Service, Forestry Sciences Laboratory, Corvallis, Oregon.

burned about 1966, and the cleared area now has dense tree regeneration. Sheep grazing was frequent in mountain meadows in this part of the Cascade Range into the 1930's. It has undoubtedly influenced the character of the various meadows found within the natural area.

Most human disturbance is along the southern margin of the area although it is considered minor; this area will probably also be the focus of any future problems. Two small areas (fig. WM-l) totalling about 4 ha. (10 acres) were clear-cut prior to natural area establishment. Some mortality (mostly wind-throw) is associated with the margins of these clear-cuts and of Forest Road 147, particularly immediately northwest of the Wildcat-Bunchgrass Mountain saddle. Some damage from road construction (sidecast dirt and rock) also occurred in this area.

Natural disturbances appear to be minor within the natural area since the bulk of the stands were established 130 years or more ago. The scattering of younger stands suggests some minor wildfires have occurred in the last 50 years. Dwarf mistletoe is present in noble fir in at least some of the area, and there also appear to be small scattered pockets of root rot.

RESEARC H

A number of research projects are already in progress at Wildcat Mountain Research Natural Area:

1. Cone production by noble fir has been observed annually since 1961 (Franklin 1968) and that by mountain hemlock and Pacific silver fir since 1967.[5] This study will continue until at least 1972.

2. Total amount and quality of annual seedfall has been under study since 1968, and this research will continue until at least 1972.[6] Seedtraps are located within a pure noble fir stand at about 1,340 m. (4,400 ft.) in the southwestern portion of the natural area and a mixed mountain hemlock-Pacific silver fir stand at about 1,430 m. (4,700 ft.) on the north slope of Bunchgrass Mountain (fig. WM-3) .

3. Vegetation-soil plots (10) have been taken within the natural area as part of a study of the forest communities and their environmental relationships in the central western Cascades of Oregon. These are being incorporated into the resulting classification.[7]

4. Numerous collections of soil fungi have been made within the natural area by Forest Service and Oregon State University mycologists.[8]

5. Stem analyses of noble fir and associated species have been made on specimens cut immediately adjacent to the natural area. Both the least and most productive sites are represented in these samples. The data is presently being analyzed (DeMars, Herman, and Bell 1970; Herman and DeMars 1970).

This natural area is considered an adjunct to the H. J. Andrews Experimental Forest located 8 km. (5 miles) southwest, providing additional representation of high-elevation true fir forest. The possibility exists of using comparable forest areas on the experimental forest for work involving destructive sampling or manipulation and using the natural area as a control site.

The H. J. Andrews Experimental Forest (including Wildcat Mountain Research Natural Area) is also an intensive study site for the U.S. International Biological Program's Coniferous Forest Biome Analysis of Ecosystems project. Two plots being used in this ecosystem research are located in the natural area.[9] one plot is located within a noble fir-Douglas-fir stand in the southwestern corner of the natural area and the other is located in a mountain hemlock-Pacific silver fir stand on the north slope of Bunchgrass

[5] Research by Dr. Jerry F. Franklin, U.S. Forest Service, Forestry Sciences Laboratory, Corvallis, Oregon.

[6] See footnote 5.

[7] Research by Dr. C. T. Dyrness, U.S. Forest Service, Forestry Sciences Laboratory, Corvallis, Oregon.

[8] Research by Dr. James M. Trappe, U.S. Forest Service, Forestry Sciences Laboratory, Corvallis, Oregon.

[9] For additional information, contact Dr. Jerry F. Franklin, U.S. Forest Service, Forestry Sciences Laboratory, Corvallis, Oregon.

Mountain. At present, soil and air temperatures, plant moisture stress, foliage nutrient content, and phenology are being monitored on these plots. Many additional studies are planned for 1972 and 1973. Small mammal populations are also under study within the mountain hemlock-Pacific silver fir stand.

The natural area provides a number of special research opportunities besides those possible in connection with already active research projects. These include research on: (1) the two small watersheds which occupy the eastern half of the area; (2) subalpine stands of varying age, composition, and productivity, including some of pure noble fir; (3) mountain meadows typical of those found in the western Cascades; and (4) succession on small, recently cut-over tracts incorporated within the natural area.

MAPS AND AERIAL PHOTOGRAPHS

Special maps applicable to the natural area are: *Topograhy-15'* Echo Mountain, Oregon quadrangle, scale 1: 62,500, issued by the U.S. Geological Survey in 1955; and *geology* - *Reconnaissance Geologic Map and Sections of the Westen Cascade Range/Oregon., North of Latitude* 43° *N.,* scale 1:250,000 (Peck et al. 1964), *Geologic Map of the Central Part of the High Cascade Range, Oregon* (Williams 1957), and *Geologic Map of Oregon West of the* 121*st Meridian,* scale 1: 500,000 (Peck 1961). Either the District Ranger (McKenzie Bridge Ranger District) or Forest Supervisor (Willamette National Forest, Eugene, Oregon) can provide details on the most recent aerial photo coverage and forest type maps for the area.

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Table WM-1. — Area of forest types in the Wildcat Mountain Research Natural Area[1]

Forest Service inventory type[2]	Major species[3]	SAF type	Age class[4]	Area	
			Years	*Ha.*	*Acres*
Cutover	NF,DF	226	10	4.0	10
FM 1	MH, PSF	205	30	4.0	10
FM 1	PSF, MH	226	20	4.0	10
FM 1	NF	226	30	4.0	10
FM 2	PSF	226	70	2.0	5
FM 3	PSF, MH	226	120	12.2	30
FM 3	MH, PSF	205	140	18.2	45
FM 3	NF	226	70	4.0	10
FM 4	NF	226	120	8.1	20
FM 4	NF, DF	226	120	72.9	180
FM 4	NF, DF	226	300	48.6	120
FM 4	NF, PSF	226	300	36.4	90
FM 4	NF, PSF, MH	226	350	28.4	70
FM 4	PSF, MH, NF	226	350	20.2	50
D 4	DF, NF	226	120	4.0	10
D 4	DF, NF, WH	230	180	16.2	40
TOTAL				287.6	710

[1] Based on 1960 inventory of the Willamette National Forest.

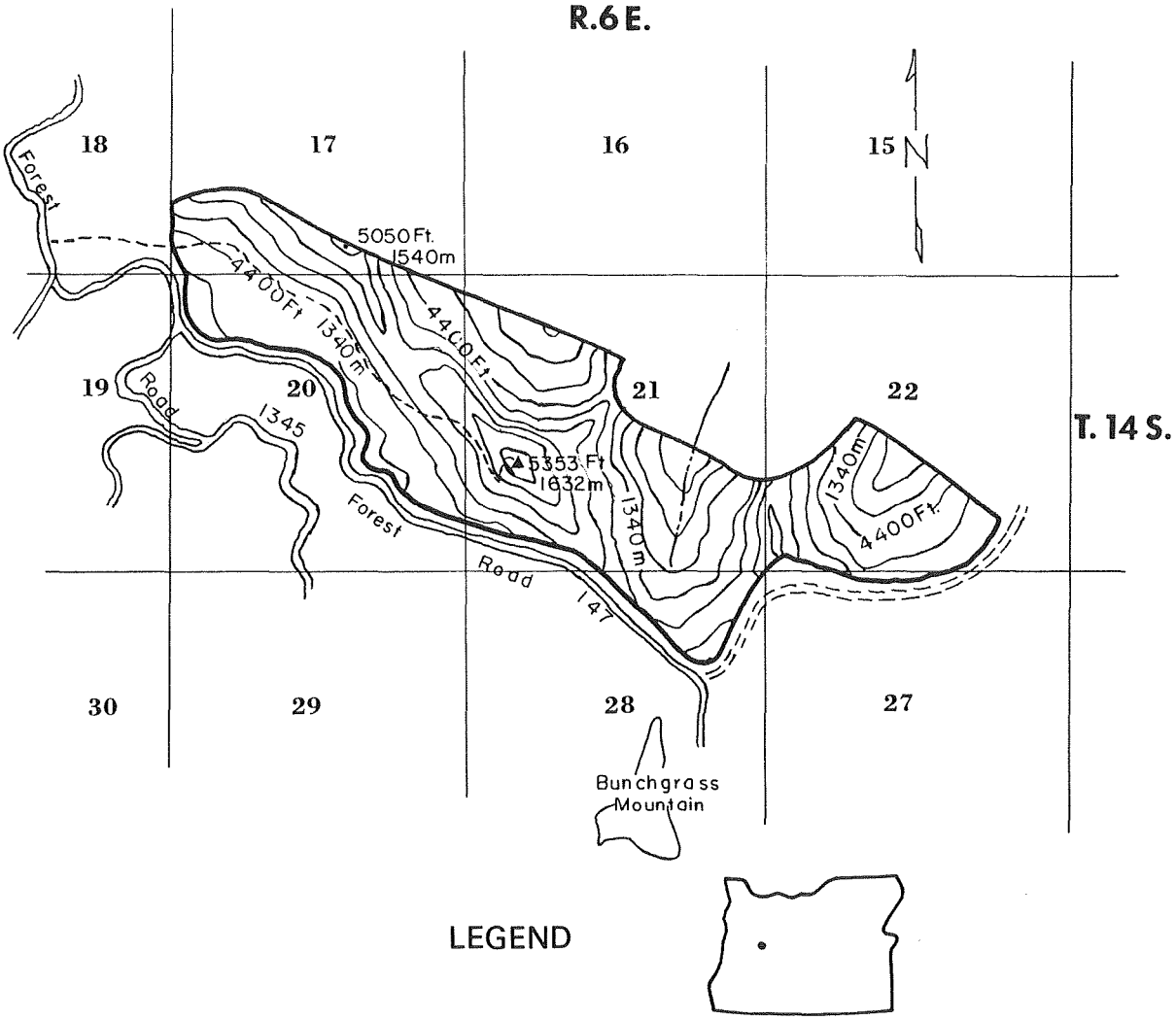
[2] Alphabetical symbols refer to forest type: FM, true fir-mountain hemlock; and D, Douglas-fir. Numeric symbols refer to size class: 1, seedlings and saplings, 0- to 5-in. d.b.h.; 2, pole timber, 5- to 11-in. d.b.h.; 3, small sawtimber, 11- to 21-in. d.b.h.; and 4, large sawtimber, 21-in. and larger d.b.h.

[3] In approximate order of importance. Abbreviations are: NF, noble fir; DF, Douglas-fir; MH, mountain hemlock; PSF, Pacific silver fir; and WH, western hemlock.

[4] Estimated age at time of 1960 inventory.

Table WM-2. — Tentative list of mammals for Wildcat Mountain Research Natural Area

Order	Scientific name	Common name
Insectivora	*Neürotrichus gibbsi*	shrew mole
	Scapanus orarius	coast mole
	Scapanus townsendi	Townsend mole
	Sorex bendirii	marsh shrew
	Sorex palustris	northern water shrew
	Sorex trowbridgii	Trowbridge shrew
	Sorex vagrans	wandering shrew
Chiroptera	*Eptesicus fuscus*	big brown bat
	Lasionycteris noctivagans	silver-haired bat
	Lasiurus borealis	red 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 townsendi	Townsend big-eared bat
Lagomorpha	*Lepus americanus*	snowshoe hare
	Ochotona princeps	pika
Rodentia	*Aplodontia rufa*	mountain beaver
	Arborimus albipes	white-footed vole
	Arborimus longicaudus	red tree vole
	Clethrionomys californicus	California red-backed vole
	Erethizon dorsatum	porcupine
	Eutamias amoenus	yellow-pine chipmunk
	Eutamias townsendi	Townsend chipmunk
	Glaucomys sabrinus	northern flying squirrel
	Microtus longicaudus	long-tailed vole
	Microtus oregoni	Oregon or creeping vole
	Microtus richardsoni	Richardson vole
	Microtus townsendi	Townsend vole
	Neotoma cinerea	bushy-tailed wood rat
	Peromyscus maniculatus	deer mouse
	Phenacomys intermedius	heather vole
	Tamiasciurus douglasi	chickaree
	Thomomys mazama	Mazama pocket gopher
	Zapus trinotatus	Pacific jumping mouse
Carnivora	*Canis latrans*	coyote
	Canis lupus	wolf
	Felis concolor	mountain lion or cougar
	Gulo luscus	wolverine
	Lynx rufus	bobcat
	Martes americana	marten
	Martes pennanti	fisher
	Mustela erminea	short-tailed weasel or ermine
	Mustela frenata	long-tailed weasel
	Mustela vison	mink
	Procyon lotor	raccoon
	Spilogale putorius	spotted skunk or civet cat
	Ursus americanus	black bear
	Vulpes fulva	red fox
Artiodactyla	*Cervus canadensis*	wapiti or elk
	Odocoileus h. hemionus	mule deer



LEGEND

BOUNDARY, WILDCAT MOUNTAIN RESEARCH NATURAL AREA

SECTION LINE

STREAM

ROAD

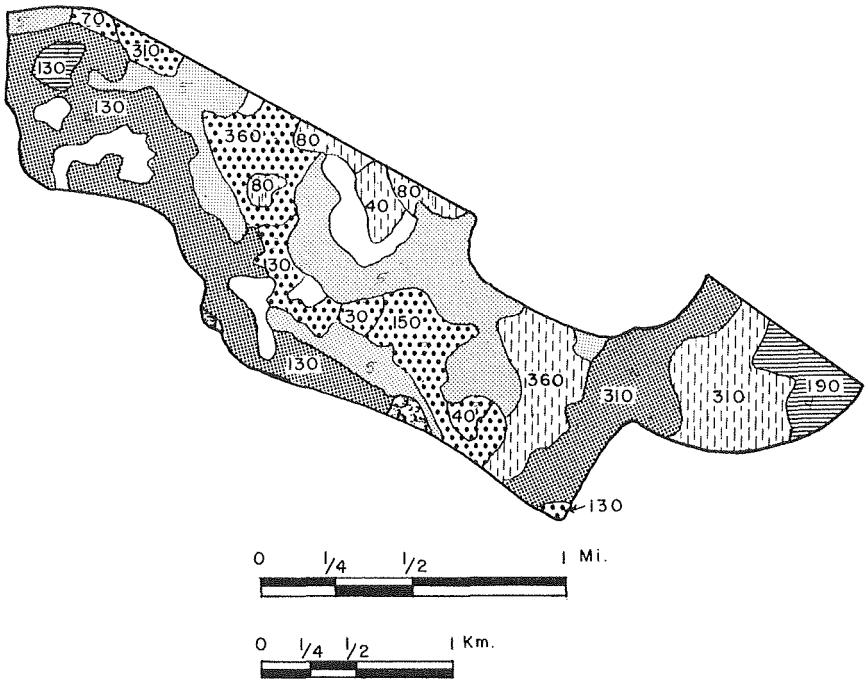
PROPOSED ROAD

TRAIL

0 1/4 1/2 1 Mi.

0 1/4 1/2 1 Km.

Figure WM-1.– Wildcat Mountain Research Natural Area, Linn County, Oregon.



LEGEND

NOBLE FIR-DOMINATED FOREST WITH PACIFIC SILVER FIR

NOBLE FIR-DOMINATED FOREST WITH DOUGLAS-FIR

MIXED FOREST OF PACIFIC SILVER FIR AND MOUNTAIN HEMLOCK

MIXED FOREST OF DOUGLAS-FIR AND NOBLE FIR

ROCKY AREAS

MOIST MEADOWS AND BRUSHFIELDS

CLEARCUT FORESTED AREAS

Figure WM-2.– Forest types and age classes in the Wildcat Mountain Research Natural Area.
(Data source: 1960 inventory, Willamette National Forest.)

Figure WM-3.-Forest communities of Wildcat Mountain Research Natural Area. Upper left: Community of *Tsuga mertensiana-Abies amabilis/Xerophyllum tenax;* the approximately 130-year-old trees average 30- to 50-cm. (12- to 24-in.) d.b.h. Upper right: Nearly pure stand of noble fir growing along Wildcat Mountain trail; these approximately 130-year-old trees average 75-cm. (30-in.) d.b.h. and 45 m. (150 ft.) tall. Lower left: Older stand (approximately 180 years) of noble fir showing abundant seedlings and saplings of Pacific silver fir, the probable climax species. Lower right: Collecting contents of seedtrap in stand of mountain hemlock and Pacific silver fir as part of long-term study of tree seeding habits on the natural area.