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

ABBOTT CREEK RESEARCH NATURAL AREA [1]

Southwestern Oregon mixed conifer forest with especially fine examples of sugar pine occupying a large (1,077 ha.) mountain stream drainage.

Abbott Creek Research Natural Area was established on November 18, 1946, to exemplify the Sierra-type mixed conifer forests found in southwestern Oregon. The tract was specifically selected because of the excellent representation of sugar pine *(Pinus lambertiana)* in many of the stands. The 1,077-ha. (2,660acre) natural area is located in Douglas and Jackson Counties, Oregon, and is administered by the Prospect Ranger District (Prospect, Oregon), Rogue River National Forest. It occupies portions of sections 23, 24, 25, 26, and 36, R. 2 E., T. 30 S., and of sections 19, 30, and 31, R. 3 E., T. 30 S., Willamette meridian. The majority of the boundaries follow physiographic features (fig. AC-1): the dividing ridge between the Rogue and Umpqua Rivers on the north, the Golden Stairs trail, which essentially follows a ridgetop on the east, and the main and west branches of Abbott Creek along much of the west edge. The natural area is located at 42^{0}56' N. latitude and 122°31' W. longitude.

ACCESS AND ACCOMMODATIONS

The natural area is approached via Oregon State Highway 26. Personnel at Prospect Ranger Station can provide directions through the network of graveled forest roads which lead from the highway to the southwestern corner (Forest Road 3047) and eastern edge (Forest Road 3016) of the tract (fig. AC-1). Unimproved dirt roads also lead to Abbott Butte Lookout at the northwestern corner (Forest Road 2923) and along the west side of the main branch of Abbott Creek; the latter road is driveable for only a short distance. The unmaintained Golden Stairs trail forms the western boundary.

Cross-country toot travel provides the only access within the natural area; there are no trails or roads inside the boundaries. Because of its large size and rugged character such travel is time consuming and often difficult and hazardous.

Commercial accommodations are available at Prospect and Union Creek located approximately 16 to 24 km. (10 to 15 miles) from the natural area. There are also numerous improved forest campgrounds in the vicinity.

ENVIRONMENT

The Abbott Creek Research Natural Area is a relatively large mountainous tract which occupies the entire drainage of the main branch of Abbott Creek as well as portions of tributary drainages (fig. AC-1). Topography is generally rugged with moderate to steep slopes and numerous rock outcrops and escarpments. Small benches along Abbott Creek and more extensive benchy areas below the summit peak of Abbott Butte provide the only gentle relief. Elevations range from about 1,000 m. (3,300 ft.) to 1,869 m. (6,131 ft.) at Abbott Butte Lookout.

The natural area is located in the geologically older western Cascades and is composed entirely of volcanic materials. Bedrock at higher elevations is composed of middle and upper Miocene andesite flows, probably belonging to the Sardine formation (Peck 1961).

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

At lower elevations, Oligocene and lower Miocene pyroclastic rocks occur and may include tuffs, breccias, and conglomerates. The summit area of Abbott Butte itself is mapped as basalt of Pliocene or Pleistocene age. Finally, some Eocene to Pliocene felsic intrusive rocks may occur along the west boundary.

The natural area is subject to a modified maritime climate with cool, wet winters and warm, dry summers. There are strong elevational gradients in temperature, snowfall, and snowpack accumulation. Lower part of the tract is typical of midelevational, montane forest environments in the southern Oregon Cascades while highest elevations are subalpine in character. Climatic data from the Prospect Weather Station located 19 km. (12 miles) southeast of the natural area are as follows (U.S. Weather Bureau 1965):

Mean annual temperature	H.9°C.(4H.f)OF.)
1\1 ean January temperature	1.HoC. (35.4 of.)
Mean July temperature	l(J.O°C.(66.2°F.)
Mean ,January minimum temperature	-3.3 °C.(26.1 of.)
Mean July maximum temperature	80.0°C.(86.1°F.)
Average annual precipitation	1,05fJ mm.(41.6H in.)
June through August precipitation	62 mm.(2.43 in.)
Average annual snowfall	161.5 cm.(63.6 in.)

Conditions are wetter and cooler on the natural area, even at lower elevations within it. Isohyetal maps suggest annual precipitation varies from 1,575 to 1,725 mm. (62 to 68 in.) on the natural area (Oregon State Water Resources Board 1959).

Soils in the area have not been mapped or described. Great soil groups present include the Lithosol, Brown Podzol, and Alluvial groups and possibly the Western Brown Forest and Gray-Brown Podzol great soil groups.

BIOTA

Approximately 832 ha. (2,055 acres) of the natural area are forested and 245 ha. (605 acres) are occupied non-forested communities. In the absence of a detailed type map it is probably best to categorize all of the forested acreage as SAF forest cover type 243, Ponderosa Pine-Sugar Pine-Douglas-Fir (Society of American Foresters 1954). Although the broadly defined type definition makes this possible, it scarcely does justice to the diversity of forest conditions present on the tract; individual stands are present which fit SAF cover types 211, White Fir; 229, Pacific Douglas-Fir; and 207, Red Fir. Kuchler (1964) types represented include 5, Mixed Conifer Forest; 7, Red Fir Forest; 12, Douglas Fir Forest; and 33, Chaparral. The bulk of the natural area lies within the Mixed Conifer Zone of Franklin and Dyrness (1969) although elements of the *Abies cancolor* and *Abies magnifica shastensis* Zones are also present at higher elevations.

Major tree species in approximate order of importance are: Douglas-fir *(Pseudotsuga menziesii),* sugar pine, white fir *(Abies concolor),* incense-cedar *(Libocedrus decurrens),* Shasta red fir *(Abies magnifica* var. *shastensis),* western hemlock *(Tsuga heterophylla),* mountain hemlock *(Tsuga mertensiana),* western white pine *(Pinus monticola),* and ponderosa pine *(Pinus ponderosa).* The first four are found over almost the entire area. White fir does tend to increase in dominance in stands at higher elevations (especially above 1,450 to 1,600 m. or 4,750 to 5,250 ft.) and in stream terraces. Shasta red fir and mountain hemlock are generally confined to elevations over 1,600 m. (5,250 ft.). Western hemlock occurs mainly on terraces next to Abbott Creek which is also where western white pine are most common. Ponderosa pine is typical of the warmest, driest habitats such as steep southerly slopes at lower elevations. Minor tree species present include subalpine fir *(Abies lasiocarpa),* bigleaf maple *(Acer macrophyllum),* golden chinkapin *(Castanopsis chrysophylla),* Oregon white oak *(Quercus garryana),* and Pacific yew *(Taxus brevifolia).*

White fir appears to be the major climax tree species in most of the forest stands. Seedlings and saplings of this species are typically more common than reproduction of Douglas-fir or incense-cedar under closed forest canopies. However, most of the stands are in relatively long-lasting seral stages

many decades, or perhaps several centuries, away from climax condition even in the absence of wildfire or other disturbances. Severe environmental conditions on many sites retard successional processes, and there are numerous small openings which allow less shade-tolerant species, such as Douglas-fir, incensecedar, and sugar pine, to reproduce (fig. AC-2).

The composition of all layers of the forest communities varies markedly with moisture and temperature gradients, which are roughly correlated with soil-land form and elevation, respectively, and with stand history. Mature forests on mid and lower slopes are dominated by a mixed overstory of Douglas-fir, incense-cedar, sugar pine, and white fir. Common understory species include *Corylus cornuta* var. *californica, Pachistima myrsinites,* golden chinkapin, *Rosa gymnocarpa,* and *Vaccinium membranaceum* in the shrub layer and *Chimaphila umbellata, Achlys triphylla, Berberis nervosa, Pyrola picta, Iris chrysophylla, Trientalis latifolia,* and *Carex* sp. in the herb layer. There are many variations on this basic theme, however. For example, incensecedar and Douglas-fir increase in relative importance and ponderosa pine and a variety of hardy intolerant shrubs and herbs, including many typical of the non-forest communities discussed below, make their appearance in drier phases of this community.

Stands on stream terraces typically have more white fir and less incense-cedar in the overstory. Douglas-fir remains a major dominant. Several species are found solely or in greatest abundance in these terrace communities: western hemlock and western white pine in the tree layer; Pacific yew, vine maple *(Acer circinatum),* and Pacific dogwood *(Cornus nuttallii)* in the shrub layer; and *Asarum caudatum, Trillium ovatum, Disporum hookeri, Clintonia uniflora, Viola glabella, Linnaea borealis, Calypso bulbosa, Anemone deltoidea, Rubus nivalis,* and *Viola sempervirens* in the herb layer. These species sharply distinguish the terrace communities from those found on more xeric habitats.

Higher elevation forest stands include some dominated by white fir with relatively lush under-stories of forbs or weeds. Typical under-story plants are *Ribes viscosissimum, Mertensiana paniculata, Smilacina sessilifolia,* and a variety of other broad-leaved herbs and several grasses. Small stands dominated by Shasta red fir, either pure or in mixture with white fir or mountain hemlock, are also present. These characteristically have sparse under-stories.

The non-forested communities are also highly variable in character including several rock outcrop types and subalpine mosaics of relatively lush herbaceous stands and tree and shrub patches. Communities on rock outcrops and scree slopes reflect the extremely xeric habitat (fig. AC-2). Typical plant species include *Ceanothus prostratus, Arctostaphylos nevadensis, Senecio integerrimus* var. *exaltatus, Pellaea* sp., *Cheilanthes gracillima, Cystopteris fragilis, Stipa columbiana, Collomia heterophylla, Cynoglossum grande, Delphinium* spp., *Ribes cereum, Marah oreganus,* and *Epilobium minutum.* On some non-forested sites, as well as in open forest stands, there are larger evergreen shrubs such as *Arctostaphylos patula, Ceanothus velutinus,* and *Garrya fremonti.*

The meadows at high elevations are dominated by herbaceous species such as *Veratrum viride, Pteridium aquilinum,* and various grasses and sedges. Small perennial herbs such as *Erythronium grandiflorum* and *Claytonia lanceolata* are also common. Intermixed with the herbaceous stands are large *Sorbus* bushes and individuals and groups of young trees - incense-cedar, white fir, and Shasta red fir. There has been extensive meadow invasion by tree species during the last century.

Mammals believed to utilize the natural area as residents or transients are listed in Table AC-l. Reptiles and amphibians present probably include spiny lizards *(Sceloporus* spp.), striped skinks *(Eumeces* spp.), garter snakes *(Thamnophis* spp.), frogs *(Rana* spp.), and toads *(Hyla* spp.). A great variety of resident and transient birds utilize the tract including grouse (Phasianidae), hawks (Accipitridae), jays (Corridae), owls (Columbidae), woodpeckers (Picidae), nuthatches *(Sitta* spp.), wrens (Troglodytidae), and sparrows

(Fringillidae).

Streams, streamsides, and springs provide some area of aquatic and semiaquatic habitat of special interest to animal ecologists and plant taxonomists. As mentioned, there are also numerous rock outcrops and cliffs which provide specialized habitats.

HISTORY OF DISTURBANCE

The most important human disturbances to the natural area have resulted from grazing and logging; fortunately the tract is large so the overall impact has not been significant. It is estimated that approximately 12 to 16 ha. (30 to 40 acres) of the natural area has been unintentionally clear-cut due to inadequate attention to the area's boundaries; this involves a clear-cut north of the west branch of Abbott Creek in sections 25 and 26 and the western third of another in section 30. Partial cutting has also taken place along the west edge of the tract in sections 30 and 31 and salvage logging in a small area just inside the boundary in section 19. Trees were marked for salvage cutting within the natural area along the west branch of Abbott Creek but were never cut; however, there is evidence of an earlier light cutting in the same area.

Drifting cattle have grazed the meadows and open forests at higher elevations for many years and still do so every summer. The grazing appears to have significantly altered the composition of meadows and of the understory in some forest stands.

A lookout station has been maintained for many years on top of Abbott Butte but has had no significant impact on the area. The only other human use of the tract is by hikers, hunters, and tourists. This is confined to the edges and has had no influence on natural processes.

Wildfire has undoubtedly been a major influence in creating the present community mosaic. Young stands, brushfields, and fire scars provide abundant evidence for periodic wildfires prior to initiation of fire control programs about 1910. None are known to have occurred in recent years.

RESEARC H

A study of the plant communities and species with emphasis on classification and environmental relationships is presently underway.2 It has also been used as a sampling site in taxonomic studies of variation in the noble - California red fir species complex.[3]

The tract provides innumerable opportunities for research on southwestern Oregon mixed-conifer forests because of its size and the diversity of stand conditions and environments present. These could include studies of hydrologic and nutrient cycling in an essentially virgin drainage; life histories of all but the largest animals; and variations in composition, productivity, and successional development of plant communities. It is an excellent location for studies of sugar pine growing under near-optimum conditions as well as for ecological studies of many other tree species. The unintentional clear-cuts also provide opportunities to study secondary succession.

MAPS AND AERIAL PHOTOGRAPHS

Special maps applicable to the natural area include: *Topography* - 15' Abbott Butte, Oregon quadrangle, scale 1: 62,500 issued by the U.S. Geological Survey in 1944; and *geology* - *Geologic Map of Oregon West of the 121st Meridian,* scale 1:500,000 (Peck 1961). Either the District Ranger (Prospect Ranger District) or Forest Supervisor (Rogue River National Forest, Medford, Oregon) can provide details on the most recent aerial photo coverage of the area.

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Table AC-1. — Tentative list of mammals for Abbott Creek Research Natural Area

Order	Scientific name	Common name
Insectivora	*Neürotrichus gibbsi*	shrew mole
	Scapanus townsendi	Townsend mole
	Sorex bendirii	marsh shrew
	Sorex palustris	northern water shrew
	Sorex trowbridgii	Trowbridge shrew
	Sorex vagrans	wandering shrew
Chiroptera	*Antrozous pallidus*	pallid bat
	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 lucifagus	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 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
	Spermophilus lateralis	mantled ground squirrel
	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
	Urocyon cinereoargenteus	gray fox
	Ursus americanus	black bear
	Vulpes fulva	red fox
Artiodactyla	*Cervus canadensis*	wapiti or elk
	Odocoileus h. hemionus	black-tailed deer

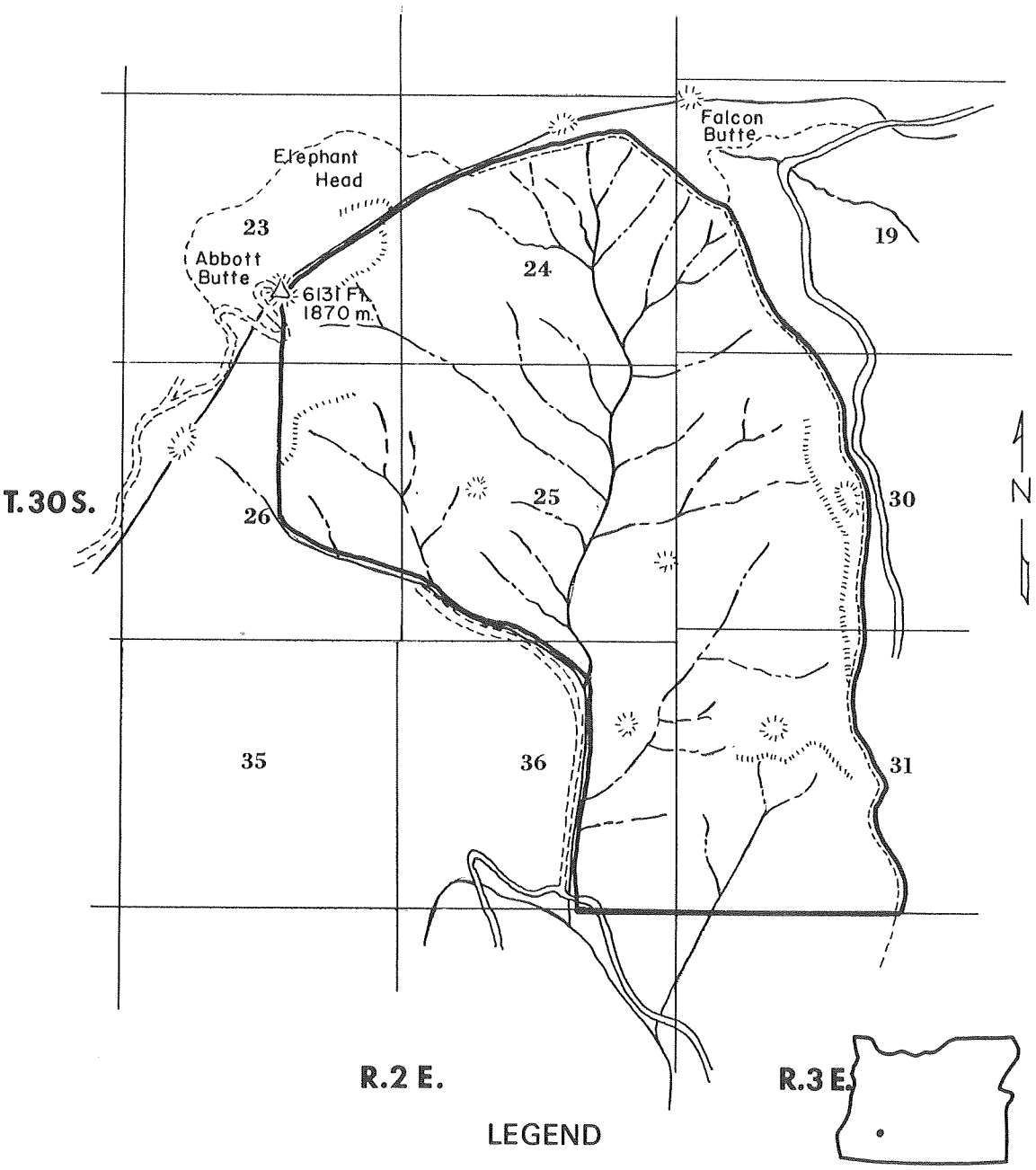

Figure AC-1.– Abbott Creek Research Natural Area, Jackson and Douglas Counties, Oregon.

Figure AC-2.-Natural features of Abbott Creek Research Natural Area. Upper left: Looking north over the northwestern quarter of the natural area from a rocky promontory in section 31; all the area visible is within the natural area. Upper right: Typical old-growth specimen of sugar pine, a species well represented in the natural area. Center left: Community of *Arctostaphylos nevadensis* and *Ceanothus prostratus* growing on an open scree slope. Lower left: Typical south slope stand of Douglas-fir, incense-cedar, and scattered sugar pine. Lower right: Forest opening occupied by reproduction of Douglas-fir and sugar pine; frequent openings of this type provide sites for reproduction of less shade-tolerant tree species.