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

CEDAR FLATS RESEARCH NATURAL AREA[1]

Old-growth stands of western red-cedar and Douglas-fir growing on valley bottom benches in the southwestern Washington Cascade Range.

Cedar Flats Research Natural Area was established on March 14, 1946, to exemplify the western red-cedar *(Thuja plicata)* stands found on valley bottom habitats in the Washington Cascade Range. The 275-ha. (680-acre) tract is located in Skamania County, Washington, and is administered by the Lewis River Ranger District (Cougar, Washington), Gifford Pinchot National Forest. The tract occupies portions of sections 11, 12, and 13, T. 7 N., R. 6 E., Willamette meridian. Legal lines form the boundaries on the north, west, and south and the Muddy River forms the boundary on the east (fig. CF -1). It lies at at 45 °06' N . latitude and 122°01' W.longitude.

ACCESS AND ACCOMMODATlONS

The natural area is located approximately 5 km. (3 miles) north of the Lewis River Ranger Station on Forest Road 125. The Lewis River Ranger Station is easiest to reach from the west via Woodland and Cougar, which are approximately 73 km. (46 miles) and 27 km. (17 miles) away on State Highway 503 and Forest Road N90. Forest Road 125 cuts through the northwestern part of the natural area providing easy access (fig. CF-1). An old trail traverses the area from north to south along the western edge of section 12 and can be utilized for portions of its length. The southwestern quarter of the research natural area is presently least accessible.

The nearest commercial accommodations are in Woodland, Washington, or can sometimes be arranged in Cougar. There are several improved forest camps in the vicinity of the natural area along the Muddy River.

ENVIRONMENT

Most of the Cedar Flats Research Natural Area occupies a gently undulating series of benches along the Muddy River. The northwestern corner of the natural area (west of Forest Road 125) is located on moderately steep slopes at the foot of some mountain ridges. Elevations range from about 366 to 640 m. (1,200 to 2,000 ft.).

Bedrock in the natural area is composed of Oligocene-Miocene volcanic rocks such as andesite flow breccias and andesite (Huntting et al. 1961). The benches are, of course, composed mainly of deposited materials. The exact nature of these materials and their mode of origin is unknown, but alluvium, glacial outwash, and mudflows are probably included. There are also surficial deposits of various Pleistocene and/or Recent volcanic ash or pumice falls, some of the ejecta forming distinct layers. Samples collected from surfaces of a nearby mudflow suggest that materials from at least the St. Helens "W" and Mount Rainier ″C″ ash deposits are present (Crandell 1969).[2]

The climate is wet and cool. Precipitation is seasonal, peaking during winter months and reaching low levels during the summer period. There are no nearby weather stations for which published data are available; how-

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

[2] Personal communication from Dr. H. W. Smith, Agronomy Department, Washington State University. Pullman.

ever, unpublished records for the Lewis River Ranger Station, located approximately 5 km. (3 miles) south of the natural area, are on file there.

Soils within the natural area have not been carefully examined. Soil types belonging to the Brown Podzolic, Sols Bruns Acides, Alluvial, and Humic Gley great soils groups were encountered during the reconnaissance. Organic soils are associated with some of the swamp and marsh land habitat. Soil profiles within the natural area typically exhibit several primary or secondary depositions of Pleistocene and/or Recent volcanic ejecta.

BIOTA

Approximately 255 ha. (630 acres) of the natural area are occupied by forest and 20 ha. (50 acres) by non-forested communities. Areas by SAF cover types are as follows (Society of American Foresters 1954):

No.	*Nome*	*Area*
230	Douglas-Fir-Western Hemlock[3]	162 ha. (400 acres)
228	Western Redcedar	8H ha. (220 acres)
221	Red Alder	4 ha. (10 acres)

The area would include Kuchler's (1964) Types 2, Cedar-Hemlock-Douglas Fir Forest; and 25, Alder-Ash Forest. The area falls within the *Tsuga heterophylla* Zone of Franklin and Dyrness (1969).

The most abundant tree species within the natural area are western red-cedar and Douglas-fir *(Pseudotsuga menziesii).* Other coniferous tree species present in lesser numbers are western hemlock *(Tsuga heterophylla),* Pacific silver fir *(Abies amabilis),* grand fir *(Abies grandis),* and western white pine *(Pinus monticola).* Hardwoods commonly encountered are red alder *(Alnus rubra),* bigleaf maple *(Acer macrophyllum),* and black cottonwood *(Populus trichocarpa).*

Stands of old-growth western red-cedar and associated swamps and marshes are the key features of the natural area (fig. CF-2). These are located on higher benches in the center of the tract near Forest Road 125 (fig. CF -1). The western red cedar range from 90- to 300cm. (36- to 120-in.) d.b.h. (fig. CF-2) and reach heights in excess of 60 m. (200 ft.). Some individual areas of dense western red-cedar trees, which were cruised at the time of the natural area establishment, contain timber volumes exceeding 2,800 cu. m. per ha. (200,000 bd. ft. per acre).

Acer circinatum and *Polystichum munitum* dominate the shrub and herb layers of most western red-cedar stands (fig. CF -2). *Cornus nuttallii,* Pacific yew, *(Taxus brevifolia),* and bigleaf maple complete the list of common tall shrubs and small trees. *Oplopanax horridum* and *Berberis nervosa* are typical low shrubs. There is a rich selection of herbs such as *Achlys triphylla, Tiarella unifoliata, Blechnum spicant, Vancouveria hexandra,* and *Gymnocarpium dryopteris.*

A variety of swamp and marsh communities are associated with seasonally or continuously wet sites. They provide habitat for a rich collection of aquatic and semiaquatic plant species. Large areas of this type tend to be a mosaic of shrub- and herb-dominated stands with scattered stunted red alder and, perhaps, conifers on hummocks (fig. CF-2). The more common shrubs are *Salix* spp., *Spiraea* sp., *Rubus spectabilis, Cornus stolonifera, Pyrus rivularis, Prunus emarginata,* and *Acer circinatum.* Herb dominants include *Athyrium filix-femina, Carex obnupta, Scirpus microcarpus,* and *Lysichitum americanum.*

Stands dominated by Douglas-fir occupy the bulk of the natural area. These include both old-growth and second-growth age classes, the former surrounding the western red-cedar type and blending with it at its edges. In these Douglas-fir-dominated stands, western hemlock and Pacific silver fir appear to be the climax species. Successional processes are particularly evident in the stands on the west and south where the Douglas-fir overstory is rapidly breaking up.

The Douglas-fir-dominated stands appear to occupy a wide range of environmental conditions judging by variations in understory composition. In the southwestern corner

[3] A portion of this area, particularly that occupied by younger stands, might be classified as SAF type 22H, Pacific Douglas-Fir.

of the natural area, *Gaultheria shallon, Acer circinatum, Berberis nervosa,* and *Achlys triphylla* are typical understory dominants. On other sites an herbaceous-dominated understory (e.g., *Polystichum munitum* and *Vancouveria hexandra)* suggest much more mesic and fertile conditions.

Wildlife make significant use of the natural area. It provides late fall and winter range for a herd of Roosevelt elk *(Cervus canadensis roosevelti)* and for deer *(Odocoileus hemionus columbianus).* In fact, these animals may be encountered in the area at almost any time of year and their grazing undoubtedly has a significant impact on the character of the plant communities. Black bear *(Ursus americanus)* also forage the swampy areas during the spring, and some may possibly hibernate on the natural area. Predators such as coyote *(Canis latrans),* cougar *(Felis concolor),* and bobcat *(Lynx rufus)* are occasional visitors, probably following the deer and elk. Other animals such as mink *(Lutreola lutreola),* river otter *(Lutra canadensis pacifica),* and beaver *(Castor canadensis)* inhabit areas along the Muddy River. A complete list of mammals believed to utilize the natural area is provided in table CF-l.

The variety of semi aquatic and terrestrial, forested and open areas, undoubtedly provide habitat for a variety of birds, reptiles, and amphibians.

RESEARCH

No research is presently known to be in progress on the natural area. Short-term studies would be extremely timely since a large portion of the natural area will be flooded if work proceeds on a proposed and licensed power dam on the Muddy River. Research opportunities include studies of: (1) the ecology of western red-cedar and associated conifers; (2) patterns in community composition and structure in relation to environmental conditions; (3) effects of Roosevelt elk on plant communities; and (4) relationships between small animal populations and plant communities over a range of terrestrial and semiaquatic habitats.

HISTORY OF DISTURBANCE

The only recent natural disturbances are those associated with the activity of the Muddy River along the eastern boundary. There is no evidence of recent wildfires within the natural area. The fire which gave rise to the second-growth Douglas-fir stands occurred at least 130 years ago.

Human disturbances are confined to roadsides and the margins of the natural area. Unfortunately, the forest stand on private land adjacent to the southern boundary of the natural area was clearcut about 1967; this has produced, and will continue to produce, some edge effects, exposing this boundary to windfall damage. Forest Road 125 has altered natural conditions in the northwestern corner of the natural area to an unknown degree, but it is located at the extreme western edges of the benches.

As mentioned, the area does lie partially within the reservoir area of Pacific Power and Light Company's Muddy River Dam project. It is not known whether the dam will be built or, if so, when.

MAPS AND AERIAL PHOTOGRAPHS

Special maps applicable to the natural area include: *Topography* –15' Mount St. Helens, Washington quadrangle, scale 1:62,500, issued by the U.S. Geological Survey in 1956; and *geology* - *Geologic Maps of Washington,* scale 1:500,000 (Huntting et al. 1961). The District Ranger (Lewis River Ranger District) or Forest Supervisor (Gifford Pinchot National Forest, Vancouver, Washington) can provide details on the most recent aerial photo coverage and forest type maps for the area.

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Table CF-1. — Tentative list of mammals for Cedar Flats Research Natural Area

Order	Scientific name	Common name
Insectivora	*Neürotrichus gibbsi*	shrew mole
	Scapanus orarius	coast mole
	Sorex bendirii	marsh shrew
	Sorex obscurus	dusky shrew
	Sorex trowbridgii	Trowbridge shrew
	Sorex vagrans	wandering shrew
Chiroptera	*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 volans	long-legged myotis
	Myotis yumanensis	Yuma myotis
	Plecotus townsendi	Townsend big-eared bat
Lagomorpha	*Lepus americanus*	snowshoe hare
Rodentia	*Aplodontia rufa*	mountain beaver
	Castor canadensis	beaver
	Clethrionomys gapperi	Gapper red-backed vole
	Erethizon dorsatum	porcupine
	Eutamias townsendi	Townsend chipmunk
	Glaucomys sabrinus	northern flying squirrel
	Microtus longicaudus	long-tailed vole
	Microtus oregoni	Oregon or creeping vole
	Neotoma cinerea	bushy-tailed wood rat
	Peromyscus maniculatus	deer mouse
	Tamiasciurus douglasi	chickaree
	Zapus princeps	western jumping mouse
Carnivora	*Canis latrans*	coyote
	Felis concolor	mountain lion or cougar
	Lutra canadensis	river otter
	Lynx rufus	bobcat
	Martes americana	marten
	Mustela erminea	short-tailed weasel or ermine
	Mustela frenata	long-tailed weasel
	Mustela vison	mink
	Spilogale putorius	spotted skunk or civet cat
	Ursus americanus	black bear
Artiodactyla	*Odocoileus h. columbianus*	black-tailed deer
	Cervus canadensis roosevelti	Roosevelt elk

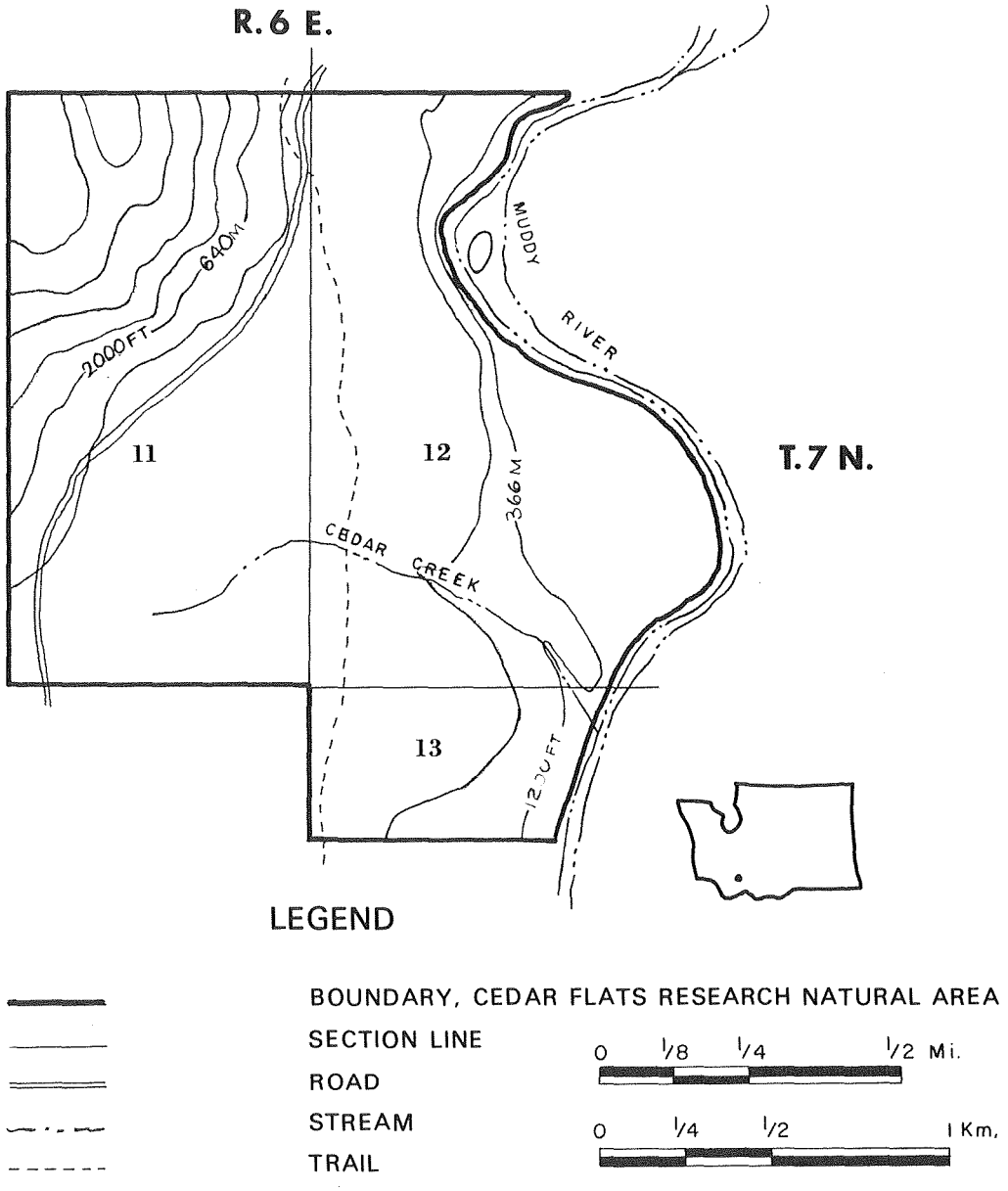
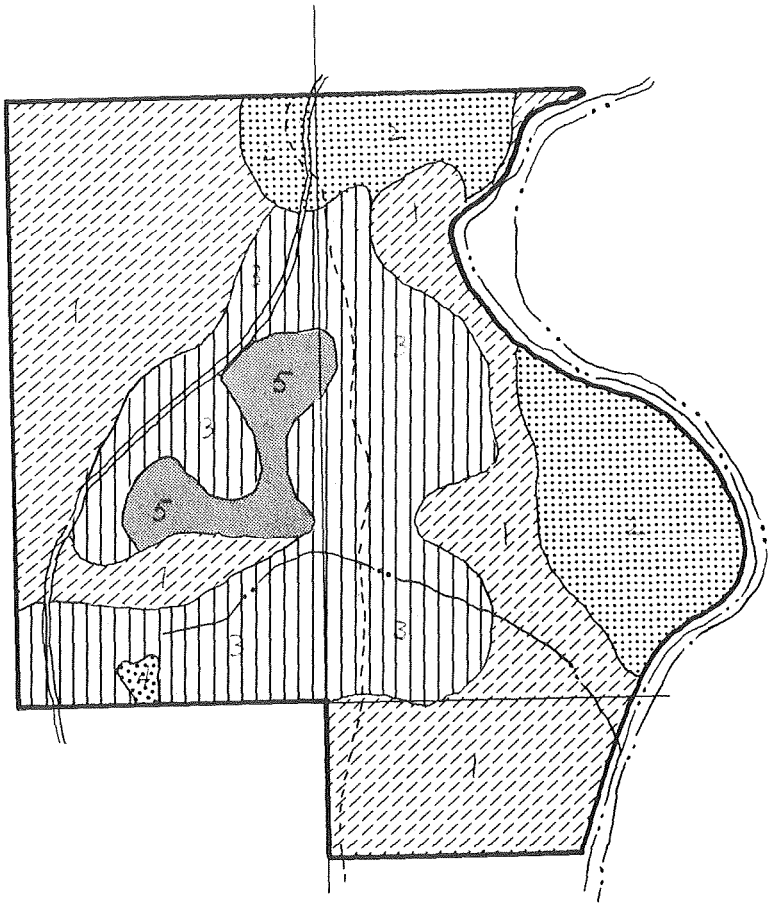


Figure CF-1.– Cedar Flats Research Natural Area, Skamania County, Washington.



LEGEND

OLD-GROWTH DOUGLAS-FIR
SECOND-GROWTH DOUGLAS-FIR
WESTERN REDCEDAR
HARDWOODS
SWAMP

0 1/8 1/4 1/2 Mi.

0 1/4 1/2 1 Km.

Figure CF-2.– Vegetation types in the Cedar Flats Research Natural Area.

Figure CF-3.-Communities of the Cedar Flats Research Natural Area. Upper left: Old-growth Douglas-fir and smaller associated western hemlock dominate a large portion of the natural area; bigleaf maple (left foreground) are scattered through both the upland and swamp habitats. Upper right: Grove of old-growth western red-cedar showing typical understory dominants-*Acer circinatum* and *Polystichum munitum.* Lower left: Hardwoods, particularly red alder, are scattered through swampy areas, such as this one dominated by Cyperaceae. Lower right: Old-growth specimens of western red-cedar attain diameters in excess of 250-cm. (100-in.) b.h.