

PORT ORFORD CEDAR RESEARCH NATURAL AREA¹

Port-Orford-cedar and Douglas-fir growing on a rugged, geologically diverse site on the southwestern Oregon Coast Ranges.

The Port Orford Cedar Research Natural Area was established on October 26, 1937, as a sample of virgin old-growth Port-Orford-cedar (*Chamaecyparis lawsoniana*). The 454ha. (1,122-acre) tract is located in Coos County, Oregon, and is administered by the Powers Ranger District (Powers, Oregon), Siskiyou National Forest. The natural area occupies section 35, a portion of the E1/2 of section 34 located south of Johnson Creek, that part of section 26 located south of Johnson Creek and west of the Coquille River, and a small part of section 36 which lies west of the Coquille River, all in T. 32 S., R. 12 W., Willamette meridian (fig. PO-I). It lies at 42°45' N. latitude and 124°05' W. longitude.

ACCESS AND ACCOMMODATIONS

Primary access is via Powers, Oregon, which lies 29 km. (18 miles) south of State Highway 42 on State Highway 242 and about 34 and 48 km. (21 and 30 miles) from Myrtle Point and Coquille, respectively. To reach the vicinity of the natural area, travel south from Powers on Forest Road 333 for about

29 km. (18 miles). The natural area can also be reached from Gold Beach on U.S. Highway 101 by traveling east along the Rogue River to Agness and then north on Forest Road 333.

There are no roads or trails within the Port Orford Cedar Research Natural Area, although remains of an old trail can be found along part of the southern boundary. Entrance into the area is difficult, involving either bush-whacking or wading. For access to the southeast and eastern portions of the natural area, cross the bridge at Ferris Ford Work Center (opposite Daphne Grove Forest Camp), hike uphill along the south boundary for several hundred yards and penetrate the natural area at or above the 380 m. (1,250 ft.) contour. To reach the southwestern corner and upper slopes of the natural area, follow Forest Road 333 south past Daphne Grove Forest Camp, thence on Forest Road 3301 to the head of Jim Hayes Creek and the top of the ridge, and walk north through a clearcut into the natural area. Access is also possible by fording Johnson Creek (easiest at its mouth) from Forest Road 326 or the South Fork of the Coquille River from Road 333.

The nearest commercial accommodations are in Powers, Myrtle Point, Coquille, and Gold Beach. However, there are several improved forest camps along Forest Road 333 in the vicinity of the natural area: Daphne Grove, Myrtle Grove, and Boundary.

ENVIRONMENT

The Port Orford Cedar Research Natural Area is topographically rugged except for occasional benches and some broad ridgetops. Slopes are particularly steep along Johnson Creek and the Coquille River. Elevations range from 259 m. (850 ft.) along these streams to nearly 760 m. (2,500 ft.) on the ridgetop in the southeast corner. Two small

PO-1

This file was created by scanning the printed publication. Text errors identified by the software have been corrected; however, some errors may remain.

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streams - Jim Hayes and Fall Creeks - lie mostly within the natural area.

The natural area is complex geologically (Diller 1903, Wells 1955, Peck 1961, Baldwin and Hess 1971) (fig. PO-2). Sedimentary materials (sandstones, siltstones, and conglomerates) make up most of the bedrock. The bulk of these belong to the Galice Formation which consists of "Dark gray to black argillite and fine to medium grained sandstone with minor amounts of conglomerate containing sedimentary clasts ..." (Baldwin and Hess 1971). This formation is Upper Jurassic in age. The contact line between this formation and the Middle Eocene Umpqua Formation (middle member) occurs along a fault line which runs north and south along the eastern edge of the natural area. Diller's (1903) mapping indicated the Tye Formation contacted the Galice Formation directly in this area but this has been corrected by Baldwin and Hess (1971). An intrusion of gabbro covers about 40 ha. (100 acres) in the southeast corner of section 35. An extensive outcropping of serpentinite occupies the northeastern point of the natural area, and recent geological mapping of the Powers Quadrangle (Baldwin and Hess 1971) suggests this body extends much further south in the natural area than Diller (1903) indicates. Finally, a small outcrop of chert is located in the northwest corner of the natural area along Johnson Creek.

The climate is wet and mild. Precipitation is seasonal, with a peak in January and December and a minimum in July and August. The summer drought period is more pronounced than in the northern Oregon and Washington coastal mountains. The following climatic data are from the closest weather station at Powers (U.S. Weather Bureau 1965):

Mean annual temperature	.....	12.0°C.	(53.6°F.)
Mean January temperature	.....	6.6°C.	(43.8°F.)
Mean July temperature	.....	17.6°C.	(63.6°F.)
Mean January minimum temperature	.....	1.6°C.	(34.8°F.)
Mean July maximum temperature	.....	25.0°C.	(77.0°F.)
Average annual precipitation	.....	1,535 mm.	(60.44 in.)
June through August precipitation	.....	56 mm.	(2.19 in.)

PO-2

Since Powers is about 150 m. (500 ft.) lower in elevation, temperatures are lower and precipitation higher on the natural area; isohyetal maps (Oregon State Water Resources Board 1959) indicate 2,500 to 2,800 mm. (100 to 110 in.) annual precipitation.

Soil profiles are not strongly developed in the area although soils are often deep. Soil surveys are not available, but most soils tend toward Reddish-Brown Lateritics with 5 to 10 cm. (2 to 4 in.) thick A1 horizons or Brown Podzolics with minimal A2 development and weak B2ir horizons. On some steep slopes and ridgetops, Lithosols with AI-AC-C horizon sequences are encountered.

BIOTA

Estimated areas by SAF cover types (Society of American Foresters 1954) are: Cover type 231, Port-Orford-Cedar-Douglas-Fir, 328 ha. (810 acres), and type 229, Pacific Douglas-Fir, 126 ha. (310 acres). The area falls within Kuchler's (1964) Type 2, CedarHemlock-Douglas Fir Forest and the *Tsuga heterophylla* Zone of Franklin and Dyrness (1969).

Douglas-fir (*Pseudotsuga menziesii*) and Port-Orford-cedar are the most important tree species present, composing approximately 75 and 25 percent, respectively, of the old-growth forests which dominate the areas (fig. PO-3). Grand fir (*Abies grandis*), western hemlock (*Tsuga heterophylla*), western red-cedar (*Thuja plicata*), sugar pine (*Pinus lambertiana*), western white pine (*Pinus monticola*), and Pacific yew (*Taxus brevifolia*) are also present. Hardwoods are well represented although not usually in the highest canopy level. Tanoak (*Lithocarpus densiflorus*), golden chinkapin (*Castanopsis chrysophylla*), and Pacific madrone (*Arbutus menziesii*) are most abundant and widespread; occurrences of bigleaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), red alder (*Alnus rubra*) and California-laurel (*Umbellularia californica*) are more localized. Most of the natural area is covered with forests of large, old trees. Although ages are not accurately known, many of the dominant specimens are undoubtedly 400 to 500 years

old. Douglas-firs of this age average nearly 60 m. (200 ft.) in height and 130-cm. (50-in.) d.b.h.; Port-Orford-cedar are a little smaller - 53 m. (175 ft.) tall and 100-cm. (40-in.) d.b.h. The largest Port-Orford-cedar measured during a 1936 cruise was 208.3-cm. (82-in.) d.b.h.

A variety of plant communities are found on the natural area. Typically, the stands have a dense understory of shrubs and small trees such as *Rhododendron macrophyllum*, *Vaccinium parvifolium*, *V. ovatum*, tanoak, golden chinkapin, *Gaultheria shallon*, and *Berberis nervosa*. *Rhododendron* may attain heights of 8 m. (25 ft.) and diameters of 10 to 15 cm. (4 to 6 in.). Herbaceous species include *Polystichum munitum*, *Galium triflorum*, *Oxalis oregana*, *Viola sempervirens*, *Goodyera oblongifolia*, *Rubus ursinus*, *Trillium ovatum*, *Whipplea modesta*, *Hierochloa occidentalis*, and *Linnaea borealis*. Succession generally seems to be toward replacement of the dominant Douglas-fir and Port-Orford-cedar by western hemlock. Hemlock seedlings and saplings are usually most abundant; those of grand fir and Port-Orford-cedar are less common or absent. However, sprout and seedling reproduction of tan oak is as abundant, or more so, than that of western hemlock in many stands, suggesting it may be a climax species.

Polystichum munitum dominates the understory on moister sites such as well watered slopes or in seep areas (fig. PO-3). A greater variety of herbs and greatly reduced shrub coverage are also typical. Western red-cedar is generally found only on these sites. Tree regeneration is mainly western hemlock.

There are some areas of shallow rocky soil, where communities are dominated by tanoak and Pacific madrone 50- to 75-cm. (20- to 30-in.) d.b.h. The understory is very dense, with 100-percent canopy coverage of low trees and shrubs - *Rhododendron macrophyllum*, tan oak, *Vaccinium ovatum*, golden chinkapin, *Gaultheria shallon*, and *Berberis nervosa*. Herbs are few, but include unusual species such as *Hemitomes congestum*, *Boschniakia hookeri*, and *Habenaria unalaschensis*.

Conifers of any size are relatively rare in these stands; tan oak is reproducing abundantly and appears to be the climax species.

Stands on the serpentinite areas are more open, composed of smaller trees (no western hemlock and little grand fir present), and include a large variety of understory species (fig. PO-3). A community dominated by Douglas-fir, Port-Orford-cedar, Californialaurel, and *Xerophyllum tenax* is typical on some serpentines; *Erythronium*, *Oreganum*, *Hierochloa occidentalis*, *Synthyris reniformis*, *Rhododendron occidentale*, *Senecio bolanderi*, *Iris innominata*, and *Berberis piperiana* are typical associates. On the dry serpentinite nose above the confluence of Johnson Creek and the Coquille River, the vegetation is a mosaic of trees, dense shrub thickets, and grassy openings (fig. PO-3). Douglas-fir, western white pine, and Port-Orford-cedar are the major trees interspersed with thickets of *Rhamnus californica* var. *occidentalis*, *Rhododendron occidentale*, and Canyon live oak (*Quercus chrysolepis*). The grassy openings are rich in species such as *Festuca subuliflora*, *Cheilanthes siliquosa*, *Silene Campanulata*, *Zigadenus fremontii*, *Brodiaea coronaria*, *Calochortus tolmei*, *Castilleja pruinosa*, *Achillea millefolium*, *Erysimum concinnum*, *Polystichum lonchitis*, *Lomatium* sp., and *Sedum spathulifolium*.

There are a number of wet benches and swales within the natural area (fig. PO-3). Red alder, Oregon ash, and bigleaf maple typify these areas as well as dense stands of *Carex obnupta*, *C. amplifolia*, and other Cyperaceae.

Mammals believed to utilize the natural area as residents or transients are listed in table PO-I. Roosevelt elk frequent the area during the fall, winter, and spring. The natural area also provides a rich variety of habitats for amphibians. Among the species occurring here are the Del Norte salamander (*Plethodon elongatus*), Dunn's salamander (*Plethodon dnni*), Pacific giant salamander (*Dicamptodon ensattus*), clouded salamander (*Aneides ferreus*), Oregon salamander (*Ensatina escholtzii*), northwestern salamander (*Ambystoma gracile*), rough-skinned newt

(*Taricha granulosa*), and the Pacific treefrog (*Hyla regilla*).

Most of the specialized habitats present in the Port Orford Cedar Research Natural Area have already been mentioned. These include lithosolic tanoak-Pacific madrone sites, serpentinite areas, and swales. There is also a small, shallow pond (several acres in size) which appears to have been formed by a land slump northwest of the center of the NE1/4 of section 35.

HISTORY OF DISTURBANCE

There is evidence in fire scars on old Douglas-fir and Port-Orford-cedar that ground fires have burned through the area periodically. None appears to have occurred in recent years. The introduced root pathogen, *Phytophthora lateralis*, has not yet invaded the natural area to any substantial degree in contrast to the situation in the nearby Coquille River Falls Research Natural Area. This pathogen, which is invariably fatal to Port-Orford-cedar, has apparently killed only a few trees at the edge of the natural area along the South Fork of the Coquille River and at the head of Jim Hayes Creek. More damage can be expected in the future.

Human disturbance of the area is minimal.

There are remains of mine workings along Johnson Creek on the north edge of the natural area. Approximately 3 ha. (7 acres) on the western edge of the natural area was accidentally clear-cut when adjacent tracts were logged about 15 years ago.

RESEARCH

There are no research studies in progress on the Port Orford Cedar Research Natural Area. Some data on community structure and limited plant collections have been obtained

by Forest Service personnel.

This natural area is especially rich in research opportunities. These include study of (1) community composition, structure and dynamics, and soil development on widely varying parent materials, and (2) the fauna and flora of an isolated pond. The possible eventual invasion of the area by *Phytophthora lateralis* makes community studies especially timely. The large number of southern or Californian species, especially on serpentinite, makes the area of special interest to the taxonomist or plant geographer.

MAPS AND AERIAL PHOTOGRAPHS

Special maps applicable to the natural area include: *Topography* - 15' Powers and Agness, Oregon, quadrangles, scale 1: 62,500, issued by the U.S. Geological Survey in 1954; and *geology - Description of the Port Orford Quadrangle*, scale 1:250,000 (Diller 1903), *Geologic Map of the Powers Quadrangle, Oregon*, scale 1: 62,500 (Baldwin and Hess 1971), *Preliminary Geologic Map of Southwestern Oregon ...*, scale 1:250,000 (Wells 1955), and *Geologic Map of Oregon West of the 121st Meridian*, scale 1: 500,000 (Peck 1961). Either the District Ranger (Powers Ranger District) or Forest Supervisor (Siskiyou National Forest, Grants Pass, Oregon) can provide details on the most recent aerial photo coverage and forest type maps for the area.

Forest type and topographic maps (scale 3 in. = 1 mi., 50-ft. contour interval) prepared by Forest Service personnel in 1938 are on file at the Pacific Northwest Forest and Range Experiment Station, Portland, Oregon, as are records of a 1938 cruise of the natural area.

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Table PO-1. — Tentative list of mammals for Port Orford Cedar Research Natural Area¹

Order	Scientific name	Common name	
Insectivora	<i>Neotrichus gibbsi</i>	shrew mole	
	* <i>Scapanus orarius</i>	coast mole	
	<i>Sorex bendirii</i>	marsh shrew	
	<i>Sorex pacificus</i>	Pacific shrew	
	* <i>Sorex trowbridgii</i>	Trowbridge shrew	
Chiroptera	<i>Sorex vagrans</i>	wandering shrew	
	<i>Antrozous pallidus</i>	pallid bat	
	<i>Eptesicus fuscus</i>	big brown bat	
	<i>Lasiorycteris noctivagans</i>	silver-haired bat	
	<i>Lasiurus borealis</i>	red bat	
	<i>Lasiurus cinereus</i>	hoary bat	
	<i>Myotis californicus</i>	California myotis	
	<i>Myotis evotis</i>	long-eared myotis	
	<i>Myotis lucifugus</i>	little brown myotis	
	<i>Myotis thysanodes</i>	fringed myotis	
	<i>Myotis volans</i>	long-legged myotis	
	<i>Myotis yumanensis</i>	Yuma myotis	
Lagomorpha	<i>Plecotus townsendi</i>	Townsend big-eared bat	
Rodentia	<i>Lepus americanus</i>	snowshoe hare	
	<i>Aplodontia rufa</i>	mountain beaver	
	<i>Arborimus albipes</i>	white-footed vole	
	<i>Arborimus longicaudus</i>	red tree vole	
	<i>Castor canadensis</i>	beaver	
	<i>Clethrionomys californicus</i>	California red-backed vole	
	<i>Erethizon dorsatum</i>	porcupine	
	* <i>Eutamias townsendi</i>	Townsend chipmunk	
	<i>Glaucomys sabrinus</i>	northern flying squirrel	
	<i>Microtus longicaudus</i>	long-tailed vole	
	<i>Microtus oregoni</i>	Oregon or creeping vole	
	<i>Microtus townsendi</i>	Townsend vole	
	<i>Neotoma cinerea</i>	bushy-tailed wood rat	
	<i>Neotoma fuscipes</i>	dusky-footed wood rat	
	* <i>Peromyscus maniculatus</i>	deer mouse	
	<i>Spermophilus beecheyi</i>	California ground squirrel	
	* <i>Tamiasciurus douglasi</i>	chickaree	
	<i>Zapus trinotatus</i>	Pacific jumping mouse	
	Carnivora	<i>Bassariscus astutus</i>	ringtail or miner's cat
		* <i>Canis latrans</i>	coyote
<i>Felis concolor</i>		mountain lion or cougar	
<i>Lutra canadensis</i>		river otter	
* <i>Lynx rufus</i>		bobcat	
<i>Martes americana</i>		marten	
<i>Mustela erminea</i>		short-tailed weasel or ermine	
<i>Mustela frenata</i>		long-tailed weasel	
<i>Mustela vison</i>		mink	
<i>Procyon lotor</i>		raccoon	
Artiodactyla	<i>Spilogale putorius</i>	spotted skunk or civet cat	
	<i>Ursus americanus</i>	black bear	
	<i>Cervus canadensis roosevelti</i>	Roosevelt elk	
	* <i>Odocoileus h. columbianus</i>	black-tailed deer	

¹ Asterisk (*) indicates habitation verified by sign, sighting, or collection.

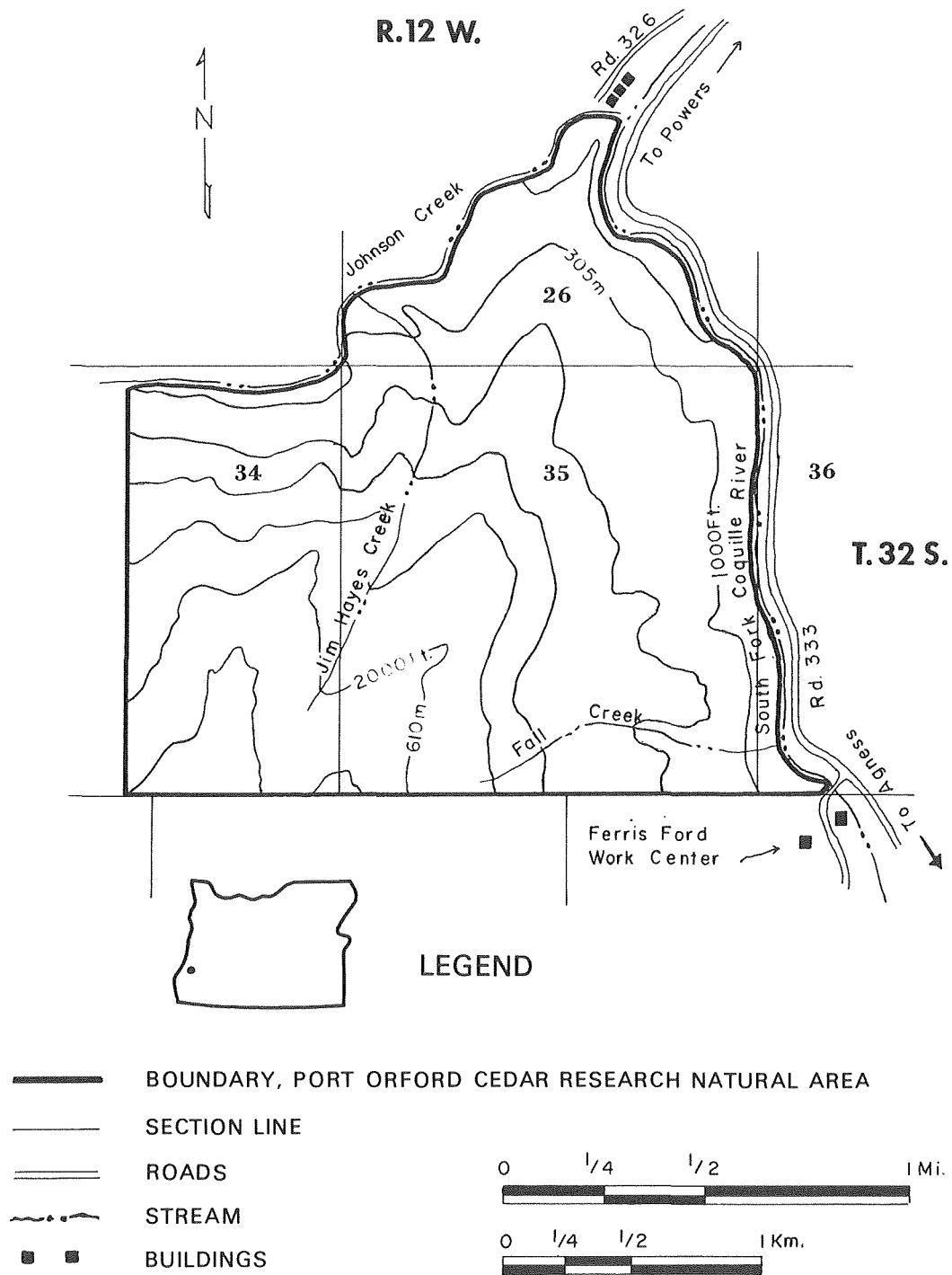
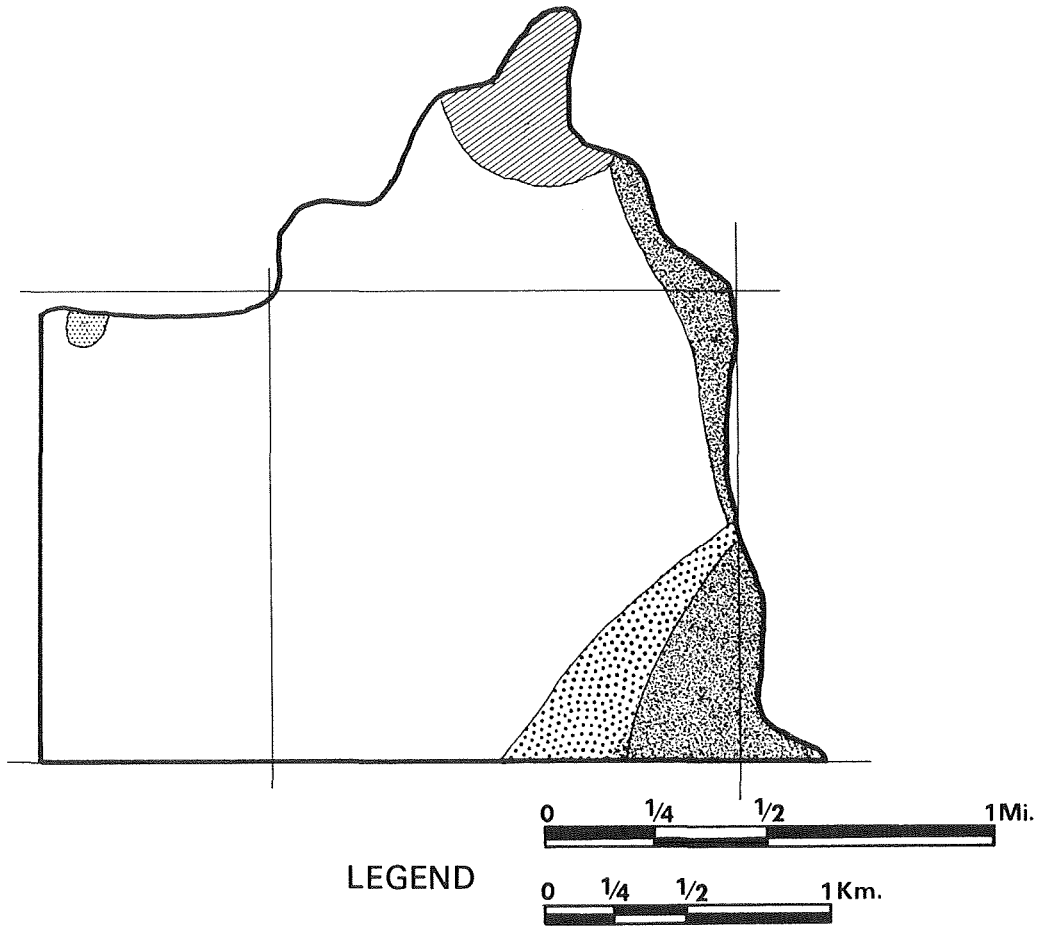


Figure PO-1.- Port Orford Cedar Research Natural Area, Coos County, Oregon.








- LEGEND**
-  GALICE FORMATION CRETACEOUS CONGLOMERATE, SANDSTONE, AND SHALE
 -  UMPQUA (MIDDLE MEMBER) FORMATION
EOCENE YELLOWISH SANDSTONE, GRAY SHALES, AND CONGLOMERATE
 -  GABBRO DEEP-SEATED IGNEOUS INTRUSIVE MASSES
 -  SERPENTINITE PRIMARILY ALTERED PERIDOTITE
 -  CHERT CREACEOUS SILICEOUS SHALE AND GRAY AND RED JASPERY ROCKS

Figure PO-2.- Geology of Port Orford Cedar Research Natural Area (after Diller 1903); recent mapping indicates the Serpentinite extends further south than is shown here (Baldwin and Hess 1971).

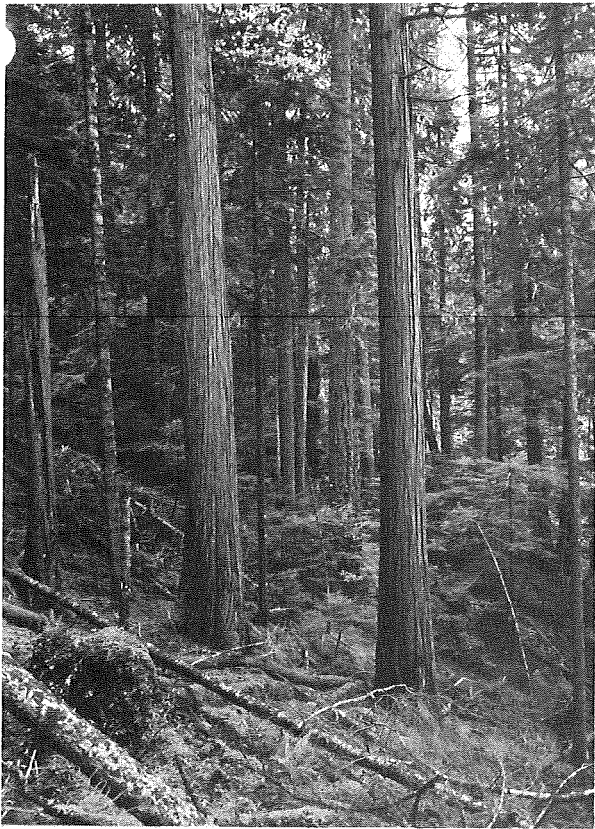
*Figure PO-3.-Communities in the Port Orford Cedar Research Natural Area. A: Mixed stand of grand fir, bigleaf maple, and western hemlock on a wet bench; understory dominated by *Polystichum munitum*. B: Open vegetational mosaic on serpentinite ridge with stunted Douglas-fir, Canyon live oak, and *Rhamnus californica*; *Festuca* spp. and forbs occupy the openings. C: Mixed stand of Port-Orford-cedar and Douglas-fir on uplands, average d.b.h. 1 DO-em. D: Swale dominated by red alder and *Carex obnupta*.*



A



B



C

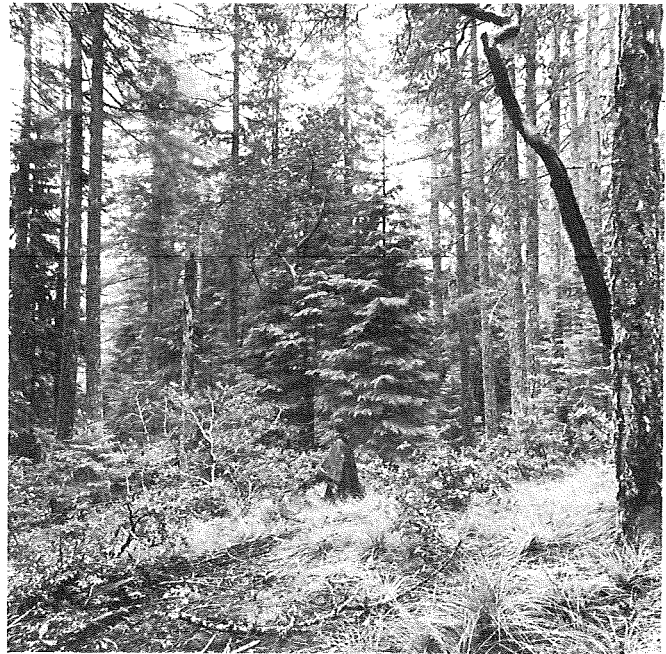


D

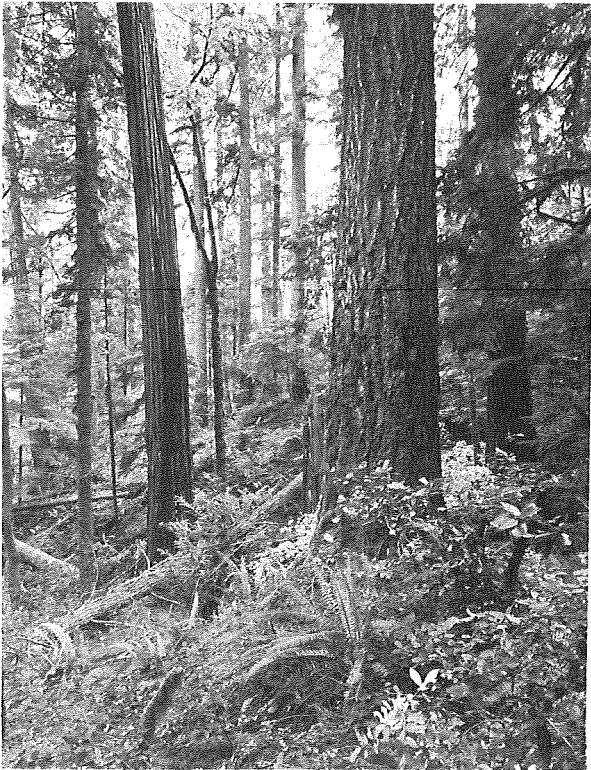
*Figure PO-3.-Communities in the Port Orford Cedar Research Natural Area (continued). E: Extensive swale on slump bench dominated by Oregon ash and *Carex obnupta*. F: Mixed forest stand located on serpentinite; Douglas-fir dominates, but Port-Orford-cedar (center) and Pacific madrone (center and right) are also present in the overstory and *Xerophyllum tenax* and tanoak in the understory. G: Typical mixed upland forest dominated by Douglas-fir, Port-Orford-cedar, and western hemlock, with tanoak and *Polystichum munitum* in the understory; note the bigleaf maple in the background (just left of center). H: Forest stand on one of the infrequent benches found along the South Fork of the Coquille River; the river forms the natural area boundary in this area.*



E



F



G



H