

## BLUEJAY RESEARCH NATURAL AREA<sup>1</sup>

Ponderosa pine/bitterbrush and lodgepole pine/bitterbrush communities located near the center of the Mount Mazama pumice deposits of south-central Oregon.

The Bluejay Research Natural Area was established March 1971 to exemplify ponderosa pine/bitterbrush/needlegrass (*Pinus ponderosa/Purshia tridentata/Stipa occidentallis*) and lodgepole pine/bitterbrush/needlegrass (*Pinus contorta/Purshia tridentata/Stipa occidentallis*) communities characteristic of the central portion of the pumice deposits resulting from the eruption of Mount Mazama (Crater Lake). The 85-ha, (210-acre) tract is located in Klamath County, Oregon, and is administered by the Chiloquin Ranger District (Chiloquin, Oregon), Winema National Forest (Klamath Falls, Oregon). The slightly rectangular area is located in the E 1/2 of section 33, T. 30 S., R. 10 E., Willamette meridian, at 42°55' N. latitude and 121°30' E. longitude (fig. BJ-1).

### ACCESS AND ACCOMMODATIONS

The natural area is located approximately 58 km. (36 miles) northeast of Chiloquin and is reached via U.S. Highway 97 and a gravel road. Access is good during summer but becomes difficult during the winter due to snow. Public accommodations are available in Chiloquin and Chemult; a primitive campground at Bluejay Springs is adjacent to the tract.

<sup>1</sup>Description prepared by Dr. F. C. Hall, U.S. Department of Agriculture, Forest Service, Region 6, Portland, Oregon.

## ENVIRONMENT

The Bluejay Research Natural Area varies in elevation from 1,380 to 1,430 m. (4,540 to 4,700 ft.). Topography is flat to undulating with occasional slopes of 20 percent. The tract is located on a large plateau area over which dacite type pumice (bulk density of 0.6 to 0.8) was aurally deposited following the eruption of Mount Mazama (Baldwin 1964). All rocks and soil existing prior to the eruption have been covered with 2 to 25 dm. (1 to 10 ft.) of this pumice.

A modified continental climate prevails. Most precipitation occurs as snow during the cool, cloudy winter. Summers are warm, generally low in precipitation and largely cloudless. One to 3 months of drought are common. Climatic data from Chemult, Oregon, located 40 km. (25 miles) northwest are as follows (U.S. Weather Bureau 1965):

Mean annual temperature	.....5.3°C. (41.5°F.)
Mean January temperature	.....-3.9°C. (25.0°F.)
Mean July temperature	.....15.3°C. (59.6°F.)
Mean January minimum temperature	.....-11.0°C. (12.1°F.)
Mean July maximum temperature	.....28.1°C. (82.7°F.)
Average annual precipitation June through August	.....676 mm. (26.6 in.)
precipitation	.....66 mm. (2.6 in.)
Average annual snowfall	.....417 cm. (164.0 in.)

Soils on the area have been mapped at a reconnaissance level. The Lapine loamy coarse sand, moderately deep phase, and a representative of the Wickiup series are present (U.S. Bureau of Indian Affairs 1958). A soil description obtained on the site, probably belonging to the Lapine series, is described below (see also fig. BJ-2). Pumice particles vary in size from coarse sand (1-mm. diameter) to pea gravel (5- to 10-mm. diameter) (fig. BJ-2). This soil is characteristic of the ponderosa pine/bitterbrush/needlegrass community:

01		Locally absent, pumice gravels on the surface, pine needles and shrub leaves under tree and shrub canopies.
A1	0 to 44 cm.	Dark brown when moist (10 YR3/2) loamy coarse sand; not plastic or sticky with very fine weak granular structure; pH 6.2; no stones.
AC	4 to 30 cm.	Dark brown (10 YR 4/3 moist, 10 YR 7/3 dry) fine gravelly loamy coarse sand; not plastic or sticky, very weak subangular blocky structure; pH 6.4; no stones.
C1	23 to 74 cm.	Light yellowish brown (10 YR 7/6 moist, 10 YR 8/3 dry) very gravelly coarse sand; not plastic or stocky, single grained; pH 6.4; no stones.
C2	74 to 109 cm.	Light yellowish brown (10 YR 7/4 moist) fine gravelly coarse sand; not plastic or sticky, single grained; pH 6.6; no stones.
C3	109 to 117 cm.	Fine gravelly coarse sand and fine loamy sand; a mixed horizon of slightly plastic and sticky to non-plastic or -sticky with variable structure from moderate subangular blocky to single grained; pH 6.4; no stones.
IIBb	117 cm.+	Buried soil; brown (7.5 YR 4/4 moist) loamy sand; slightly plastic and slightly sticky with moderate subangular blocky structure; pH 6.6; 20 to 40 percent stones.

A Wickiup type soil occurs in swale topography at the west edge of the tract and currently supports lodgepole pine/bitterbrush/ needlegrass.

## BIOTA

Estimated areas by plant community are:

<i>Name</i>	<i>Area</i>
Ponderosa pine/bitterbrush/ needlegrass .....	65 ha. (160 acres)
Lodgepole pine/bitterbrush/ needlegrass .....	20 ha. (50 acres)

The ponderosa pine/bitterbrush/needlegrass stands can be assigned to SAF forest cover type 237, Interior Ponderosa Pine (Society of American Foresters 1954), and Kuchler's (1964) Type 10, Ponderosa Pine

Shrub. Lodgepole pine/bitterbrush/needlegrass communities belong to SAF forest cover type 218, Lodgepole Pine; Kuchler does not recognize lodgepole pine as a type. The natural area falls within the *Pinus ponderosa* Zone (Franklin and Dyrness 1969).

The communities of ponderosa pine/bitterbrush/needlegrass fit the habitat type descriptions of Dyrness and Youngberg (1966) and Volland (1963) who worked in this general area. The plant community is dominated by ponderosa pine (*Pinus ponderosa*), bitterbrush (*Purshia tridentata*), and needlegrass (*Stipa occidentalis*) associated with *Carex rossii*, *Erigonum nudum*, *Viola purpurea* var. *purpurea*, and bottlebrush squirreltail (*Sitanion hystrix*). Ponderosa pine crown cover varies from 10 to 30 percent. Site index for ponderosa pine is 70 according to Meyer (1961); ponderosa pine basal area averages 16 sq. m. per hectare (70 sq. ft. per acre). All pines are growing slowly, suggesting near maximum stocking for the site (fig. BJ -2).

The lodgepole pine/bitterbrush/needlegrass community occurs in a swale topographic position on the tract's west edge. Lodgepole pine (*Pinus contorta*) dominates with bitterbrush, needlegrass, and some *Arctostaphylos uva-ursi*. It represents only moderate productivity according to Youngberg and Dahms (1970).

Resident and transient mammals believed to frequent the natural area are listed in table BJ -1. Mule deer (*Odocoileus hemionus*) utilize the area for spring, summer, and fall range.

## HISTORY OF DISTURBANCE

Fire scars on ponderosa pine indicate ground fires periodically burned the area prior to initiation to fire control programs in 1910. According to these fire scars, the last wildfire occurrence was about 1916. Age classes of bitterbrush and ponderosa pine saplings suggest that both were established after the last ground fire.

Domestic sheep occasionally grazed the area in early spring. Ranger District records suggest sheep use never exceeded moderate levels and usually was light so domestic

animals have apparently not seriously affected the vegetation.

## RESEARCH

Vegetation, soil description, and environmental notes for the pine/bitterbrush/needlegrass community are available.<sup>2</sup> No other research on the tract is known. However, relevant research in the general vicinity has been conducted by Dyrness and Youngberg (1966), Volland (1963), and Youngberg and Dahms (1970).

The Bluejay Research Natural Area provides interesting research opportunities: (1) to evaluate soils and vegetation in relation to the Mount Mazama pumice deposits in conjunction with Goodlow Mountain Research

<sup>2</sup>Research by L. A. Volland; available from the Division of Range and Wildlife Management, U.S. Forest Service, P.O. Box 3623, Portland, Oregon 97208.

Natural Area on the southwestern edge of Mazama deposit and the Metolius Research Natural Area located near the northern edge of aurally deposited pumice; (2) to compare microsite relations and biomass productivity of ponderosa pine and lodgepole pine; and (3) as a reference stand for undisturbed vegetation in the center of aurally deposited Mount Mazama pumice.

## MAPS AND AERIAL PHOTOGRAPHS

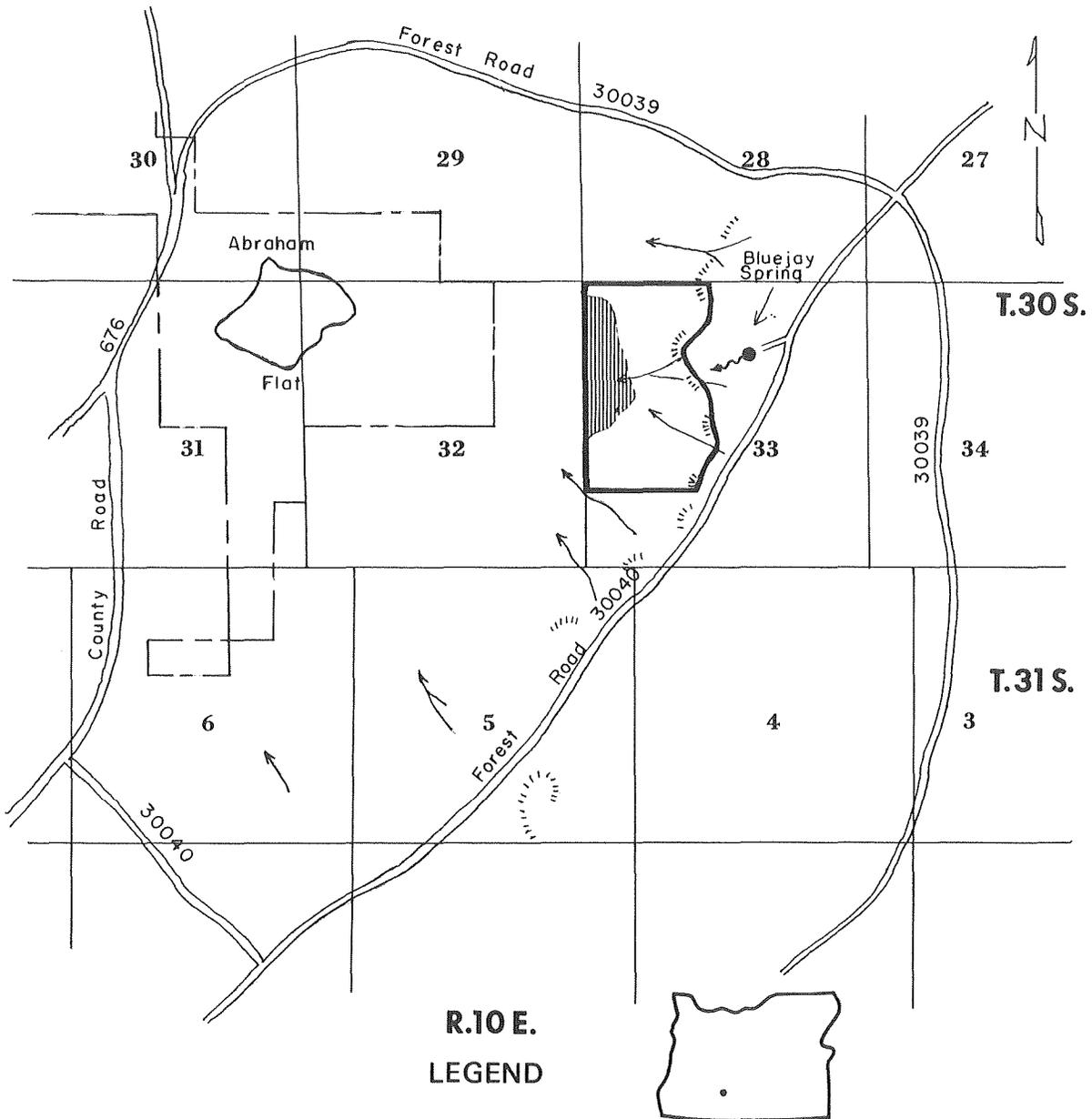
No special topographic or geologic maps are available for the natural area which are sufficiently detailed to be useful. Either the District Ranger (Chiloquin Ranger District) or Forest Supervisor (Winema National Forest, Klamath Falls, Oregon) can provide details of the most recent aerial photo coverage of the area.

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**Table BJ-1. — Tentative list of mammals for the Bluejay Research Natural Area**

Order	Scientific	Common name
Insectivora	<i>Scapanus latimanus</i>	broad-footed mole
	<i>Sorex vagrans</i>	wandering shrew
Chiroptera	<i>Antrozous pallidus</i>	pallid bat
	<i>Eptesicus fuscus</i>	big brown bat
	<i>Lasionycteris 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
	<i>Plecotus townsendi</i>	Townsend big-eared bat
Lagomorpha	<i>Lepus californicus</i>	black-tailed jack rabbit
	<i>Sylvilagus nuttalli</i>	mountain cottontail
Rodentia	<i>Erethizon dorsatum</i>	porcupine
	<i>Eutamias amoenus</i>	yellow-pine chipmunk
	<i>Glaucomys sabrinus</i>	northern flying squirrel
	<i>Neotoma cinerea</i>	bushy-tailed wood rat
	<i>Peromyscus maniculatus</i>	deer mouse
	<i>Sciurus griseus</i>	western gray squirrel
	<i>Spermophilus beldingi</i>	Belding ground squirrel
	<i>Spermophilus lateralis</i>	mantled ground squirrel
	<i>Tamiasciurus douglasi</i>	chickaree
	<i>Thomomys mazama</i>	Mazama pocket gopher
Carnivora	<i>Canis latrans</i>	coyote
	<i>Felix concolor</i>	mountain lion or cougar
	<i>Lynx rufus</i>	bobcat
	<i>Martes americana</i>	marten
	<i>Mephitis mephitis</i>	striped skunk
	<i>Mustela frenata</i>	long-tailed weasel
	<i>Spilogale putorius</i>	spotted skunk or civet cat
	<i>Taxidea taxus</i>	badger
	<i>Urocyon cinereoargenteus</i>	gray fox
	<i>Ursus americanus</i>	black bear
Artiodactyla	<i>Vulpes fulva</i>	red fox
	<i>Odocoileus h. hemionus</i>	mule deer



-  BOUNDARY, BLUEJAY RESEARCH NATURAL AREA
  -  SECTION LINE
  -  ROADS
  -  SPRING
  -  DRY DRAWS
  -  ESCARPMENT OUTCROPS
  -  LODGEPOLE PINE TYPE
  -  PONDEROSA PINE TYPE
- 0 1/4 1/2 1 Mi.
- 0 1/2 1 Km.

Figure BJ-1.- Bluejay Research Natural Area,  
Klamath County, Oregon.

*Figure BJ-2.-Natural features of the Bluejay Research Natural Area. Upper left: A ponderosa pine/bitterbrush/needlegrass community typical of those occupying the bulk of the area. Upper right: Ground vegetation showing charred shrub stump and absence of herbaceous plants, a typical condition on soils from Mount Mazama pumice. Bottom: Soil profile showing the 11-dm.(44-in.- ) thick layer of aurally deposited pumice over a buried soil.*

