

PATAHA BUNCHGRASS RESEARCH NATURAL AREA¹

A grassland-forest mosaic of blue-bunch wheatgrass and Douglas-fir communities located at the northern edge of the Blue Mountains in south-east Washington.

The Pataha Bunchgrass Research Natural Area was established in December 1968 as an example of mountain bunchgrass vegetation occurring at the transition from coniferous forest to steppe vegetation. The 20.7-ha. (51acre) tract is located in Garfield County, Washington, and is administered by the Pomeroy Ranger District (Pomeroy, Washington), Umatilla National Forest. It is located in the NW1/4 of section 1, T. 9 N., R. 42 E., Willamette meridian, at 46°17' N. latitude and 117 °30' W. longitude.

ACCESS AND ACCOMMODATIONS

Access is via State Highway 128 from Pomeroy to the junction with Forest Road No. N-94 (Iron Spring Road), a distance of 22 km. (14 miles). Road N-94 passes along the eastern side of the tract (fig. PB-1). Access during summer is good but becomes difficult during the winter. Public accommodations are available in Pomeroy or about 9 km. (6 miles) south of the tract at Big Springs Forest Camp.

ENVIRONMENT

The Pataha Bunchgrass Research Natural Area has a mean elevation of 1,372 m. (4,500

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

ft.) with a total variation of about 60 m. (200 ft.). Topography varies from fiat to steep where it forms an upper part of the slope adjacent to Pataha Creek. The tract is located on the edge of a dissected plateau straddling the transition from the fiat plateau top to steep canyon slopes. Columbia River basalts underlie the entire area. They have been uplifted and severely dissected by natural erosion.

A modified maritime 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 Peola, located 3 km. (2 miles) to the north are as follows (U.S. Weather Bureau 1956):

Mean January temperature	.....7°C.	(20°F.)
Mean July temperature	.....20°C.	(65°F.)
Average annual precipitation	.....584 mm.	(23.12 in.)
June through August		
precipitation	.....100 mm.	(3.94 in.)
Average annual snowfall	.....229 cm.	(90.00 in.)

Soils on the area have not been mapped recently; the Waha, Underwood, and Helmer soil series are possibly present (Washington Agricultural Experiment Stations 1954). Soil descriptions obtained at the time of the guidebook field examination are as follows:

(1) A shallow Lithosol with little profile development located on a plateau top of 0- to 5-percent slope and occupied by a bluebunch wheatgrass (*Agropyron spicaitum*)-Idaho fescue (*Festuca idahoensis*) community:

A	0 to 15 cm.	Very dark brown (10 YR 2/2 moist, 2/8 dry) silt loam; slightly plastic, slightly sticky, with moderate, very fine subangular blocky structure; pH 6.7.
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B	15 to 25 cm.	Dark brown (7.5 YR 3/2 moist and dry) stony silt; slightly plastic, slightly sticky with strong, very fine subangular blocky structure; pH 6.7; 80- to 90-percent stone.
Bedrock	25 cm. +	Poorly cracked; evidence of restricted moisture drainage.

(2) A very shallow Lithosol with little profile development located on a 20-percent slope at the transition from plateau top to steep sideslope and occupied by a Sandberg's bluegrass (*Poa sandbergii*)-bluebunch wheatgrass community:

A	0 to 10 cm.	Dark brown (7.5 YR 2/2 moist, 3/2 dry) gravelly silt loam; slightly plastic, slightly sticky with weak, very fine granular structure; pH 6.8; 30- to 40-percent gravel.
B	10 to 20 cm.	Dark brown (7.5 YR 2/2 wet, 3/2 dry) very stony silt loam; slightly plastic, slightly sticky with weak, very fine granular structure; pH 6.8; 90- to 95-percent stone.
Bedrock	20 cm. +	Poorly cracked; evidence of restricted drainage.

(3) Profile with moderate development on steep (60- to 80-percent) southerly slope occupied by bluebunch wheatgrass community:

A	0 to 20 cm.	Dark brown (7.5 YR 2/2 moist, 3/3 dry) gravelly loam; slightly plastic, non-sticky with weak, very fine granular structure; pH 6.8; 30- to 40-percent gravel.
B	20 to 50 cm.	Dark brown (7.5 YR 2/2 moist, 3/2 dry) gravelly silt loam; plastic and slightly sticky with moderate, fine subangular blocky structure; pH 6.9; finely vesicular when dry; 20- to 40-percent stone, 20- to 30-percent gravel.
C	50 to 65 cm.	Dark brown (7.5 YR 3/2 moist, 4/4 dry) gravelly silt loam; plastic and slightly sticky with moderate, fine subangular blocky structure; pH 6.8; vesicular when dry; 20- to 40-percent stone, 20- to 30-percent gravel.
Bedrock	65 cm. +	Poorly cracked; evidence of clay depositions.

Moderate, northerly exposed slopes occupied by forest have Gray Wooded soils developed in 30 to 45 cm. (12 to 18 in.) of volcanic ash overlying buried soils which appear similar to the grassland soils.

BIOTA

Estimated areas by community types are:

Name	Area
<i>Agropyron spicatum</i> / <i>Poa sandbergii</i>	13 ha. (33 acres)
<i>Pseudotsuga menziesii</i> - <i>Abies grandis</i> / <i>Vaccinium membranaceum</i>	7 ha. (18 acres)

The forest stands probably are assignable to SAF forest cover Type 210, Interior Douglas-Fir (Society of American Foresters 1954), and Kilchler's (1964) Type 14, Grand Fir/Douglas Fir Forest. The grasslands best fit Kuchler's (1964) Type 51, Wheatgrass-Bluegrass. The area would fall within a ponderosa pine (*Pinus ponderosa*) Zone if it were present in this area. However, most vegetation in the Blue Mountains is strongly affected by topography and soils, and this tract is an excellent example. South slopes represent an upper elevational extension of the bunchgrass steppe, and north slopes represent a lower elevational extension of fir forest.

Bluebunch wheatgrass dominates the bunch grass stands (fig. PB-2). The relative position of wheatgrass in the plant community varies with soils and topography. On the plateau, it tends to dominate in both density and volume with Idaho fescue and Sandberg's bluegrass as constant and important associates. *Eriogonum heracleodes*, *Lupinus sericeus*, *Erigeron eatoni*, *E. bloomeri*, *Balsamorhiza serrata*, and *Achillea millefolium* are commonly present. On the transition from plateau to steep slopes, bluebunch wheatgrass codominates with Sandberg's bluegrass while *L. sericeus*, *E. eatoni*, *E. bloomeri*, and *B. serrata* are present. Bluebunch wheatgrass again dominates in both density and volume on steep south slopes. Sandberg's bluegrass and Idaho fescue are clearly subordinant in density and volume. Associated species are different, including *Berberis*

repens, *Eriogonum heracleoides*, and *Penstemon deustus*; and *Lupinus* and *Erigeron* spp. are generally absent. On the plateau top, the natural area contains a small example of grassland on rather deep soil, which Idaho fescue clearly dominates. Associated species are *Poa pratensis* and *Bromus tectorum*.

Most of the seven forested hectares (18 acres) represent seral stages of the *Abies grandis/Vaccinium membranaceum* association (Hall 1967). Douglas-fir (*Pseudotsuga menziesii*) dominates the tree overstory with occasional ponderosa pine (fig. PB-2). Reproduction is largely grand fir (*Abies grandis*). Ground vegetation is dominated by *Vaccinium membranaceum* and pinegrass (*Calamagrostis rubescens*) associated with species such as elk sedge (*Carex geyeri*), *Hieracium albiflorum*, *Lupinus latifolius*, and several well-developed colonies of the orchid *Cypripedium montanum*.

A *Pinus ponderosa/Calamagrostis rubescens* community forms an interrupted transitional band between grassland and Douglas-fir forest (fig. PB-2). Ponderosa pine clearly dominates and exhibits an open growth form with living branches extending within 3 m. (10 ft.) of the ground. Pinegrass strongly dominates ground vegetation, with other species such as *Spirea lucida*, elk sedge, *Lupinus latifolius*, and *Achillea millefolium* as common associates. Reproduction of Douglas-fir and grand fir is sporadic despite an abundant, adjacent seed source, suggesting this pine community is reasonably stable successionaly.

Mammals believed to utilize the tract as residents or transients are listed in table PB1. Elk (*Cervus canadensis*) use the area as winter range and occasionally as spring or fall range during deeper snowfall. In general, they tend to move off the tract sufficiently early in the spring that grazing damage to grasses is prevented. Most forbs seem unpalatable to elk in this area.

HISTORY OF DISTURBANCE

Fire scars on ponderosa pine indicate periodic ground fires prior to initiation of fire control programs in 1910. Lack of dominant

old-growth grand fir in the *Pseudotsuga-Abies/Vaccinium* community and downed western larch (*Larix occidentalis*) suggests all portions of the forest have burned at some time. Sufficient grass volume is present on the grassland to carry a fire so one should assume it has been burned. Fire scars suggest the last fire was about 1890.

Domestic livestock grazed the tract to some extent between 1890 and 1945, when livestock numbers in the allotment were reduced. Topography and lack of water have precluded extensive or heavy livestock use. The area has probably not been significantly altered by grazing.

RESEARCH

Vegetation and soil descriptions and environmental notes for the grasslands on the plateau top, a steep south slope, and the transitional area are available.² Vegetation analysis utilized the "three step method" in which a 1.9-cm. or % -in. loop is placed 100 times along each of two transects and on which vegetation or ground cover notes are made. Reconnaissance notes are also available for the forest vegetation.

The natural area provides interesting research opportunities on (1) effects of game use on bunch grass vegetation; (2) factors responsible for the mosaic pattern of forest and non-forest communities; (3) variation in bunch grass communities from flat plateau to steep slopes; and (4) biomass production as affected by soils and topography under a single macroclimate.

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 (Pomeroy Ranger District) or Forest Supervisor (Umatilla National Forest,

² Research by Dr. F.C. Hall, Division of Range and Wildlife, U.S. Forest Service, P.O. Box :3623, Portland, Oregon.

Pendleton, Oregon) can provide details on the most recent aerial photo coverage of the area.

LITERATURE CITED

Hall, Frederick Columbus

1967. Vegetation-soil relations as a basis for resource management on the Ochoco National Forest of Central Oregon. 207 p., illus. (Ph.D. thesis, on file at Oreg. State Univ., Corvallis.)

Kuchler, A.W.

1964. Manual to accompany the map of potential natural vegetation of the conterminous United States. Am.

Geogr. Soc. Spec. Publ. 36, various
paging, illus.

Society of American Foresters

1954. Forest cover types of North America (exclusive of Mexico). 67 p., illus. Washington, D.C.

U.S. Weather Bureau

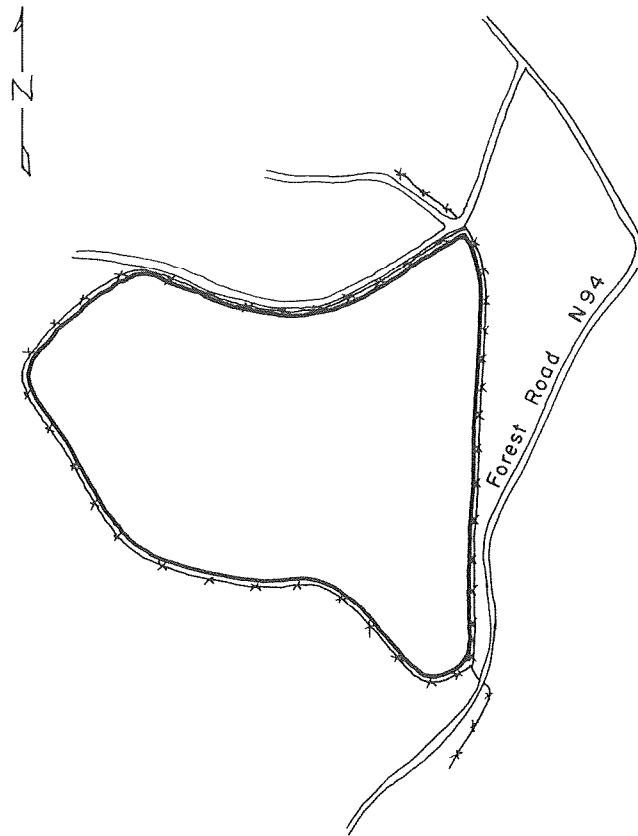
1956. Climatic summary of the United States - supplement for 1931 through 1952, Washington. Climatography of the United States 11-39, 79 p., illus.

Washington Agricultural Experiment
Stations

1954. Soils of Washington and their related physiography. Asotin County Section. Wash. Agric. Exp. Stn. Circ. 258, 6 p., illus.

Table PB-1 — Tentative list of mammals for Pataha Bunchgrass Research Natural Area

Order	Scientific name	Common name
Insectivora	<i>Scapanus orarius</i>	coast mole
	<i>Sorex merriami</i>	Merriam shrew
	<i>Sorex palustris</i>	northern water shrew
	<i>Sorex preblei</i>	Preble shrew
	<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 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 subulatus</i>	small-footed myotis
	<i>Myotis thysanodes</i>	fringed myotis
	<i>Myotis volans</i>	long-legged myotis
	<i>Myotis yumanensis</i>	Yuma myotis
	<i>Pipistrellus hesperus</i>	western pipistrel
	<i>Plecotus townsendi</i>	Townsend big-eared bat
	Lagomorpha	<i>Lepus americanus</i>	snowshoe hare
<i>Lepus californicus</i>		black-tailed jack rabbit
<i>Sylvilagus nuttalli</i>		mountain cottontail
Rodentia	<i>Clethrionomys gapperi</i>	Gapper red-backed vole
	<i>Erethizon dorsatum</i>	porcupine
	<i>Eutamias amoenus</i>	yellow-pine chipmunk
	<i>Glaucomys sabrinus</i>	northern flying squirrel
	<i>Microtus longicaudus</i>	long-tailed vole
	<i>Microtus montanus</i>	mountain vole
	<i>Microtus richardsoni</i>	Richardson vole
	<i>Neotoma cinerea</i>	bushy-tailed wood rat
	<i>Peromyscus maniculatus</i>	deer mouse
	<i>Phenacomys intermedius</i>	heather vole
	<i>Spermophilus columbianus</i>	Columbian ground squirrel
	<i>Spermophilus lateralis</i>	mantled ground squirrel
	<i>Tamiasciurus hudsonicus</i>	red squirrel
	<i>Thomomys talpoides</i>	northern pocket gopher
	<i>Zapus princeps</i>	western jumping mouse
	Carnivora	<i>Canis latrans</i>	coyote
<i>Felis concolor</i>		mountain lion or cougar
<i>Lynx canadensis</i>		Canadian lynx
<i>Lynx rufus</i>		bobcat
<i>Martes americana</i>		marten
<i>Martes pennanti</i>		fisher
<i>Mephitis mephitis</i>		striped skunk
<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
<i>Spilogale putorius</i>		spotted skunk or civet cat
<i>Taxidea taxus</i>		badger
Artiodactyla	<i>Ursus americanus</i>	black bear
	<i>Cervus canadensis</i>	wapiti or elk
	<i>Odocoileus h. hemionus</i>	mule deer



LEGEND

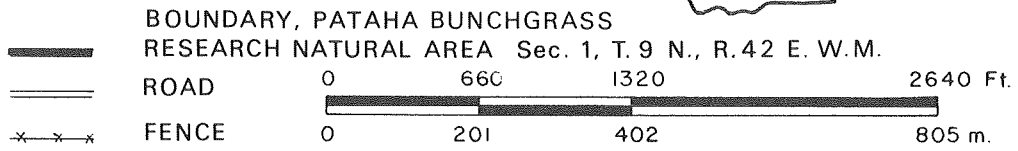


Figure PB-1.- Pataha Bunchgrass Research Natural Area, Garfield County, Washington.

Figure PB-2.-Natural features of Pataha Bunchgrass Research Natural Area. Upper left: Flat plateau top with bluebunch wheatgrass-Sandberg's bluegrass community on soils 3 to 4 dm. (12 to 18 in.) deep. Upper right: Topographic break from plateau to steep slopes occupied by community of Sandberg's bluegrass and low-density bluebunch wheatgrass growing on shallow soil 2 to 3 dm. (8 to 12 in.) deep. Lower left: Steep (60-percent), south slope occupied by bluebunch wheatgrass community with scattered Sandberg's bluegrass growing on deep, colluvial soil. Lower right: North-slope forest stand on *Abies grandis/Vaccinium membranaceum* habitat type with Douglas-fir, occasional ponderosa pine, and pinegrass.

