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Priest River Experimental Forest

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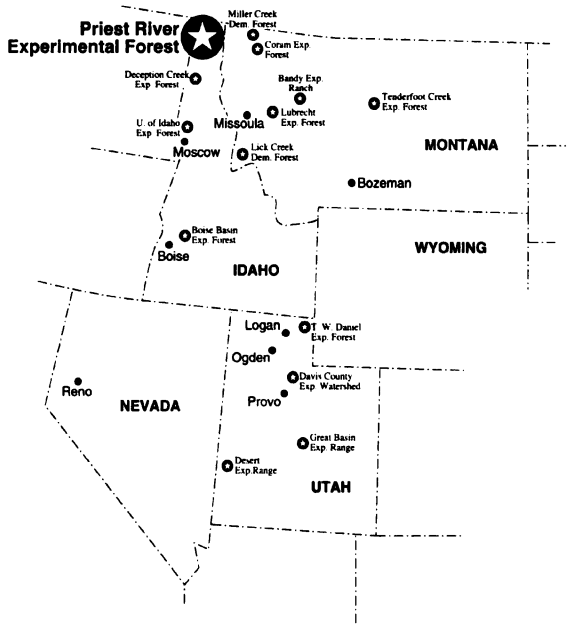


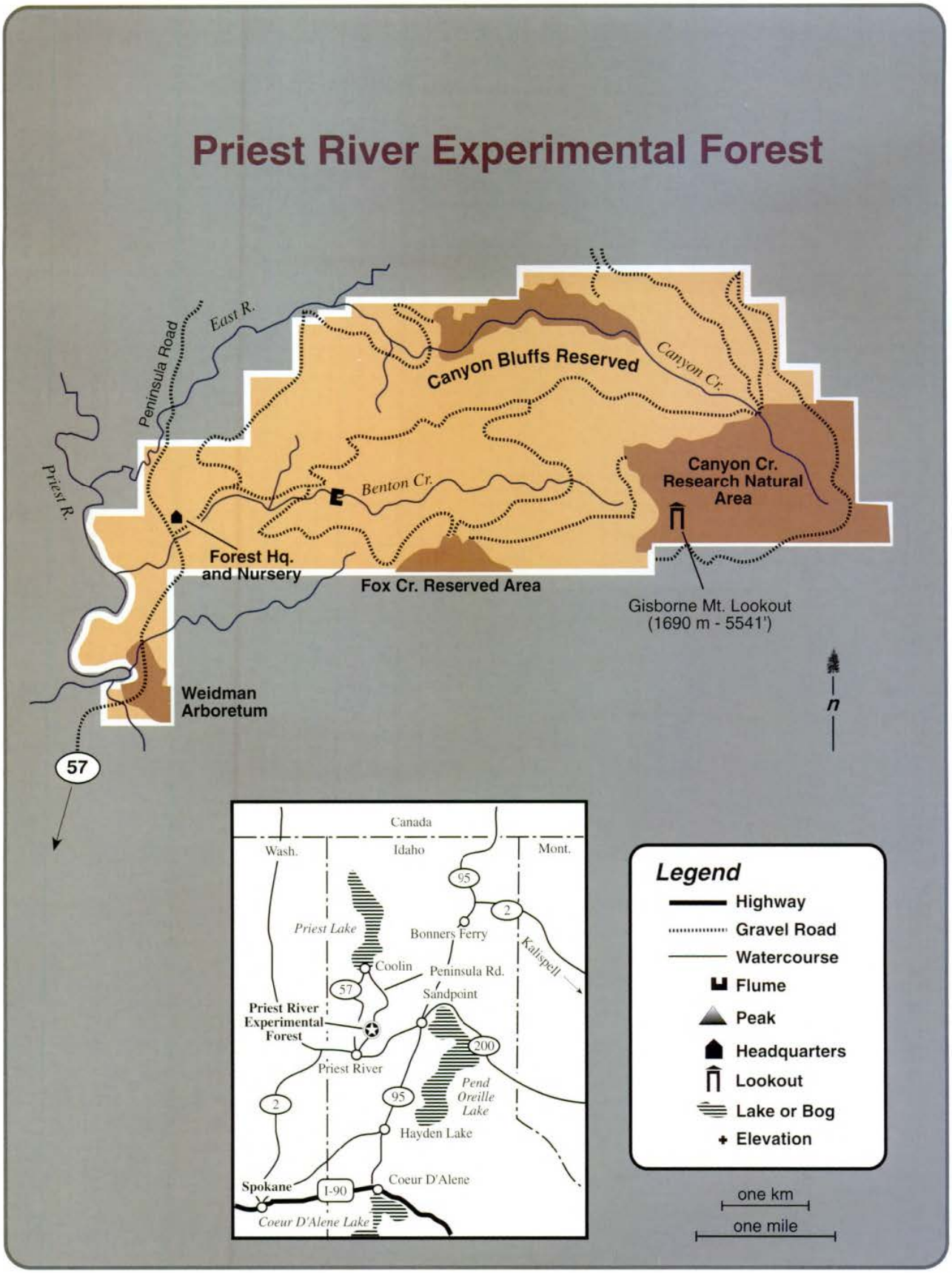
Priest River Experimental Forest was among the first experimental forests set aside as a forestry research center in September 1911. The forest served as the headquarters for the Priest River Forest Experiment Station until 1930 when the forest was incorporated into the Northern Rocky Mountain Forest and Range Experiment Station. The forest is currently administered by the Intermountain Research Station.

Since Priest River Experimental Forest's establishment, numerous educators, Forest Service researchers, and state and private forestry personnel have used the forest. Research conducted by Bob Marshall, Harry Gisborne, Ken Davis, Charles Wellner, and Irvine Haig provided information on basic forestry principles still used today for managing Rocky Mountain forests. These people and other researchers throughout the Forest's history have made it a key location for conducting forestry research.

The forest encompasses 2,600 ha (6,400 acres) with elevations ranging from 680 to 1,800 m (2,230 to 5,900 ft) above sea level. It exists primarily on slopes ranging from 20 to 60 percent. Two major drainages, Benton and Canyon Creek, flow east to west bisecting the forest, resulting in predominantly north- to northwest- and south- to southwest-facing slopes.

Climate

The climate of Priest River Experimental Forest is influenced by the Pacific Ocean, which causes a modified maritime climate. Precipitation averages 817 mm (32 inches) with most of the moisture falling as snow and occurring between November and January. Summers are usually sunny and dry in July and August with intermittent rain in the early spring and fall. The average mean annual temperature is 7 °C (44 °F).


Priest River Experimental Forest
East R.
Peninsula Road
Priest R.
Canyon Bluffs Reserved
Canyon Cr.
Benton Cr.
Canyon Cr. Research Natural Area
Forest Hq. and Nursery
Fox Cr. Reserved Area
Gisborne Mt. Lookout (1690 m - 5541')
Weidman Arboretum
57
n
Canada
Wash.
Idaho
Mont.
95
2
Priest Lake
Bonners Ferry
Kalispell
Coolin
Peninsula Rd.
57
Sandpoint
Priest River Experimental Forest
200
Priest River
Pend Oreille Lake
2
95
Hayden Lake
Spokane
I-90
Coeur D'Alene
Coeur D'Alene Lake
Legend
Highway
Gravel Road
Watercourse
Flume
Peak
Headquarters
Lookout
Lake or Bog
Elevation
one km
one mile

Soils

The soils are categorized within the Typic Vitrandepts soil complex. These soils have a thick mantle of volcanic ash-influenced loess from Cascade volcanoes overlaying belt series parent material. Variations within this major soil complex are dependent on elevation, slope, aspect, and topographic position.

Main Communities

The wide range of elevation and aspects on Priest River Experimental Forest support several mixed conifer vegetation types also found throughout the Northern Rocky Mountains. The five major forest types include subalpine fir (*Abies lasiocarpa*), grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western redcedar (*Thuja plicata*). Western hemlock is the dominant forest type (52 percent) with equal distribution among the other forest types. Greater than 60 percent of the area is approaching mid to late seral successional stages with tree ages between 80 and 160 years old. Only a small portion of the forest is in early successional stages (less than 30 years). This mixture of forest types and understory vegetation enables the forest to provide a wide range of forest sites for conducting different types of research. The major drainages, Benton Creek, Canyon Creek, and the Wild and Scenic Priest River, also provide a wide variety of forest conditions and riparian areas that contribute to the research and aesthetic value of the forest.

Headquarters building at Priest River Experimental Forest.

Data Bases

Information on climate can be obtained from the weather data that has been recorded at Priest River Experimental Forest. For example, a weather station has recorded air temperature, relative humidity, and precipitation since 1911. Daily precipitation and maximum and minimum temperatures are filed with the National Weather Service. A gauging dam established in 1937 records flow rates from the 386 ha (960 acres) Benton Creek drainage. In addition, since the 1940's snow accumulation and water content are recorded through the winter months from low—725 m (2,380 ft)—and high—1,455 m (4,755 ft)—elevation snow courses in cooperation with the Soil Conservation Service.

Several areas on Priest River Experimental Forest are set aside to protect the forest's natural diversity. The Canyon Creek Research Natural Area is 393 ha (982 acres) and was set aside in 1937 to preserve undisturbed conditions of the forest. This research natural area provides undisturbed baseline information often used in conjunction with other study sites on the forest. Two other unusual areas are reserved on Priest River Experimental Forest and

A field tour for forest ecology and silviculture instructors on Priest River Experimental Forest.

treated as potential research natural areas. One area on the south central section of the forest is a Douglas-fir/ninebark (*Physocarpus malvaceus*) habitat type on a south-facing slope. The other area is along the lower stretches of Canyon Creek, containing ponderosa pine (*Pinus ponderosa*) and Douglas-fir forest types, cliffs, and a scenic stretch of rapids and falls.

Other permanent special research areas include an arboretum and two nurseries. The 40 ha (100 acres) Weidmann Arboretum was set aside in 1929 for native and exotic tree species. The arboretum provides demonstration plots for researchers to conduct genetic tests on adaptability of various tree species to different climates. Benton Flats Nursery is 6 ha (15 acres) and is used for genetic, silviculture, and soil biology research. A second, smaller (0.20 ha) high-elevation (1,570 m; 5,150 ft) nursery is used for genetics research.

Examples of Research

Past Research

Silviculture research conducted at Priest River Experimental Forest provided information for managing forest vegetation to meet a wide variety of objectives for application throughout the Northern Rocky Mountains. Regeneration studies using shelterwood, seed tree, and clearcut methods have provided recommendations for regenerating mixed conifer forest types. Site preparation, planting, cleaning, weeding, and thinning studies provided information on how to regenerate and maintain forest stand composition and growth. Researchers have also studied the effects of these disturbances on wildlife, soils, and water quality.

Forest genetic research conducted at Priest River Experimental Forest has supplied a wealth of information to managers. A racial variation test was established in 1911 to study the performance of ponderosa pine from 22 locations. This study provided valuable information on the genetic variation among different seed sources within a tree species. Other studies included tests to determine growth characteristics of disease resistant western white pine (*Pinus monticola*) and the use of short-term (3 to 4 years) common gardens to determine the geographic and ecologic variation among tree species.

Fire research began at Priest River Experimental Forest with Harry T. Gisborne developing the first Fire-Danger Rating System. This was the foundation for current fire danger systems now used throughout the United States and Canada. Fire behavior, fuel flammability, and fire effects research all had their beginnings at Priest River Experimental Forest.

Forest growth and yield research for the Northern Rocky Mountain mixed conifer forest type has been conducted since 1912. Several permanent plots on the forest are remeasured at regular intervals. Information from these plots and other locations throughout the Northern Rocky Mountains is used to verify and develop growth and yield models.

An overview of the forest on Priest River Experimental Forest.

Other studies conducted at Priest River Experimental Forest have included watershed, disease, soils, and forest succession research, and development of management strategies for improving water quality and quantity. Studies have included effects of prescribed burning on water quality, transpiration and water loss from forest soils, and snow interception and evaporation losses in pure and mixed conifer stands.

Current Research

Current research at Priest River Experimental Forest is concentrating on ecosystem processes and functions. Studies include the effects of management practices on long-term soil productivity, quantifying forest health, observing changes in photosynthetic rates and atmospheric carbon dioxide levels caused by elevational and climatic differences, locating carbon reserves and determining where carbon is stored in forest ecosystems, and testing alternate silviculture systems that can be used without depleting wildlife, soil productivity, and water quality. Fire research continues on the forest, with studies observing successional and vegetation differences in relation to different burn severities. Current watershed research includes monitoring water quality changes due to soil erosion and runoff.

The facilities and surrounding forest are important for technology transfer. They provide visitors an opportunity to meet researchers and discuss management concerns while in

a forest setting. Priest River Experimental Forest is also a superb area for training individuals on how to conduct research and establish experiments. For example, the variety of vegetation types provides an ideal location for plant identification training within a short distance from the living facilities.

Facilities and Administration

Priest River Experimental Forest has well-established living quarters, offices, conference room, shop, and laboratory facilities. These facilities are currently nominated for the State and National Historical Register. Laboratory, conference, and shop facilities are available from April 1 through November 1. Living facilities, however, are available throughout the year. Priest River Experimental Forest can provide sleeping accommodations for 30 people comfortably but can accommodate up to 40 people for short periods.

The forest is within the Priest Lake Ranger District of Idaho Panhandle National Forests. Priest Lake Ranger District personnel provide all road maintenance, fire protection, and timber sale preparation and administration. A research scientist in the Silviculture and Genetics Work Unit in Moscow, Idaho, manages Priest River Experimental Forest. There is also a full-time superintendent on the forest throughout the year.

Location

Priest River Experimental Forest is in the Priest River Drainage on the toe slope of the Selkirk Mountains. It is 13 km (8 miles) north of Priest River, Idaho. Latitude is 48°21′ N. and longitude is 116°51′ W. Main access is on Peninsula Road off State Highway 57.

Suggested Reading

Goddard, Ray E.; McDonald, Geral I.; Steinhoff, Raphael J. 1985. Measurement of field resistance, rust hazard, and deployment of blister rust-resistant western white pine. Res. Pap. INT-358. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 8 p.

Graham, R.T. 1982. Influence of tree and site factors on western redcedar's response to release: a modeling analysis. Res. Pap. INT-296. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 19 p.

Haig, I.T.; Davis, K.P.; Weidmann, R.H. 1941. Natural regeneration in the western white pine type. Tech. Bull. No. 767. Washington, DC: U.S. Department of Agriculture. 99 p.

Leaphart, Charles D.; Stage, Albert R. 1955. Climate: a factor in the origin of the pole blight disease of *Pinus monticola* Dougl. Ecology. 52(2): 229-239.

Wellner, Charles A. 1977. Frontiers of forestry research: Priest River Experimental Forest, 1911-1976. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

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