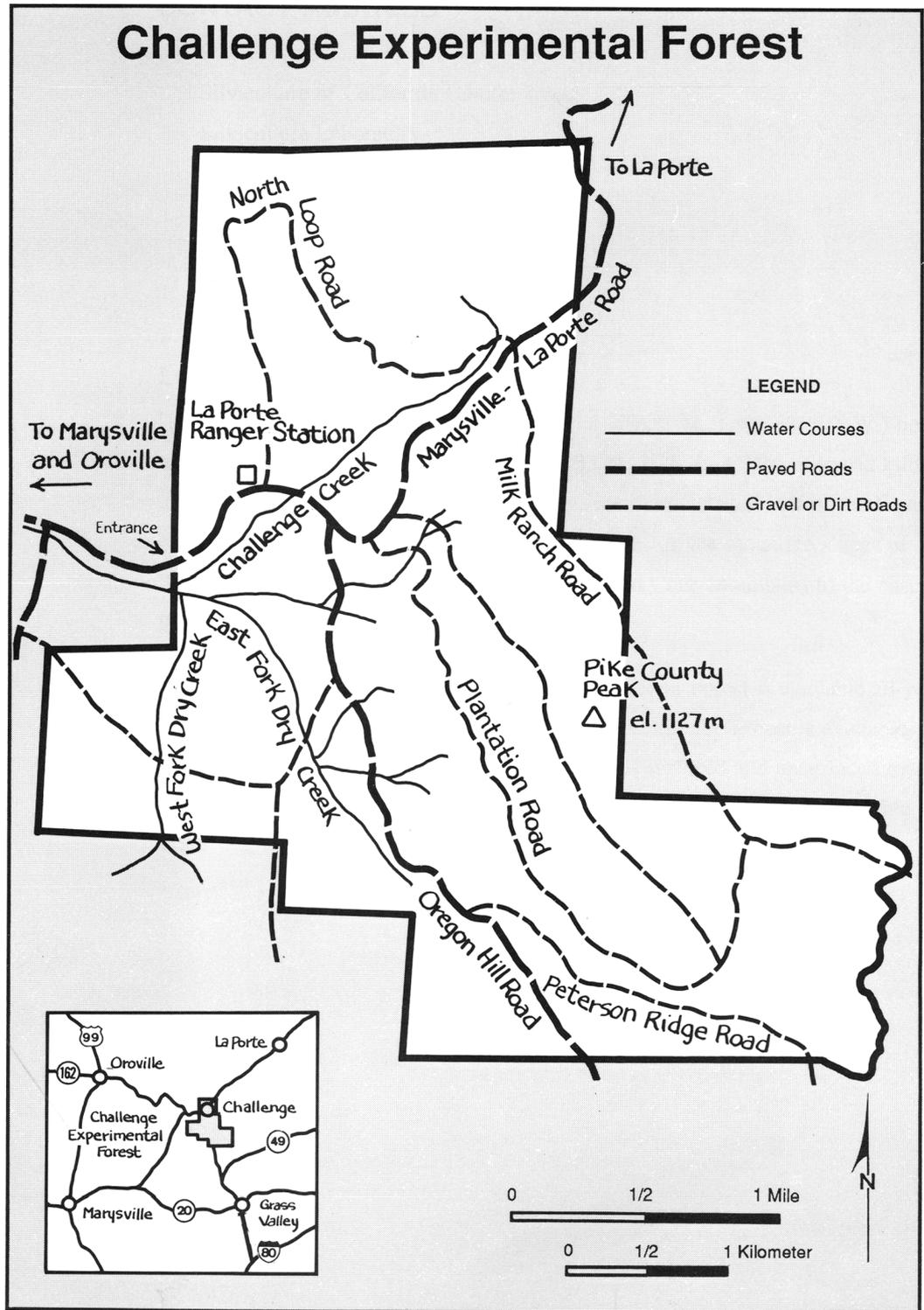


Challenge Experimental Forest



CHALLENGE

Experimental Forest

The Challenge Experimental Forest comprises 1446 hectares surrounding the town of Challenge. The property was deeded to the U.S. Government as a place for field studies and for demonstration of forest management practices on stands of second-growth ponderosa pine (*Pinus ponderosa* Dougl. ex Laws. var. *ponderosa*) and associated species (*fig. 2*). Results of studies conducted here were expected to be directly applicable to more than 800,000 hectares of low elevation, highly productive sites on the west slope of the northern Sierra Nevada.

The Experimental Forest, formally designated in 1942, was not activated until 1958. Early research sought answers to two major questions: (1) How to grow and harvest young-growth (80-100 years old) ponderosa pine to ensure adequate regeneration, and (2) how to dispose of logging slash to reduce fire hazard and ensure



Figure 2—Clearcutting with natural regeneration was successfully applied to the second-growth stands of ponderosa pine and associated species on the Challenge Experimental Forest.

adequate regeneration. Both even-aged (clearcutting, seedtree, and shelterwood) and uneven-aged (group- and single-tree selection) management systems were studied. Timber harvesting was accomplished through a cooperative agreement with the Soper-Wheeler Company³ of Strawberry Valley, California. Management of native California hardwoods, field testing of hybrid and introduced pine species, and amount and pattern of soil moisture depletion by individual trees were other important early studies. Experiment Station personnel were stationed at Challenge from 1958 until 1982 with office and laboratory facilities in the La Porte Ranger Station. The number of permanent, full-time personnel reached a maximum of two research foresters, two technicians, and a secretary when most of the regeneration cutting experiments were installed in the early 1960's.

Stand conditions are as follows. Uncut or partially cut sawtimber stands occupy about 930 hectares in which volumes of the conifer component average 322 cubic meters per hectare. Regenerated clearcuts as old as 25 years occupy about 514 hectares. Many of the clearcuts occupied by woody shrubs and poorly stocked with conifers were mechanically cleared of shrubs and interplanted with ponderosa pine and Douglas-fir (*Pseudotsuga menziesii* [Mirb.] Franco var. *menziesii*) during 1982-1987.

CLIMATE

The climate is Mediterranean in that summers are warm and dry, and winters are cool and wet. Mean annual precipitation is 1727 millimeters, 98 percent of which falls between October and May. Occasional snowfalls melt rapidly leaving the ground free of snow most of the winter. Mean annual temperature is 13°C. Mean maximum temperature of 21°C is reached in July, and mean minimum temperature of 6°C is reached in January.

SOILS

Most soils are old and deep. The Aiken and Sites Series cover most of the Experimental Forest. Site index (Powers and Oliver 1978) averages 100.

³Mention of trade names or products is for information only and does not imply endorsement by the U.S. Department of Agriculture.

MAIN COMMUNITIES

Pacific Ponderosa Pine (SAF 245) is the major forest cover type (Eyre 1980). Sierra Nevada Mixed Conifer (SAF 243), California Black Oak (SAF 246), and Pacific Ponderosa Pine–Douglas-fir (SAF 244) types also are present.

DATA BASES

Precipitation and maximum and minimum temperatures have been recorded at the Challenge Ranger Station since 1938.⁴ Soils have been mapped both by the Cooperative Soil Vegetation Survey⁵ and the University of California, Davis, in cooperation with Yuba County (Herbert and Begg 1969). The timber was inventoried in 1938 and 1939, and again in 1979.

EXAMPLES OF RESEARCH

- Management of native hardwoods
- Effect of timber harvesting on soil nitrogen transformations and mobility
- Influence of initial spacing and woody understory vegetation on growth and development of planted ponderosa pine
- Regeneration following single-tree and group selection cutting
- Interspecies relationships in California mixed conifers
- Influence of crown mass on litter decomposition and nutrient release
- Evaluation of ponderosa and sugar pine progeny derived from phenotypically superior trees.

⁴Data on file at the Pacific Southwest Research Station, Redding, Calif.

⁵Maps and legends for quadrangles 39 D-3 and 50 A-2 are available from California State Cooperative Soil-Vegetation Survey, California Department of Forestry and Fire Protection, Sacramento.

FACILITIES

The Challenge Experimental Forest has no facilities other than a small shed for storage of field equipment. Temporary office space and equipment storage may be available at the La Porte Ranger Station. Gasoline and general merchandise can be obtained in the town of Challenge, but not lodging. The nearest accommodations are in Oroville or Marysville.

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LOCATION

The Challenge Experimental Forest surrounds the small community of Challenge, Yuba County, which is 42 road kilometers southeast of Oroville and 56 road kilometers northeast of Marysville (see map). It occupies portions of T. 19 N., R. 7 E., MDM (lat. 39°28' N., long. 121°13' W.). Elevations range from 730 to 1130 meters.

Access to the Experimental Forest is available all-year via the paved Marysville-La Porte Road. Access within the Experimental Forest is available most of the year via one paved road and a system of graveled but unplowed roads.

