

Many Ways to Manage Lodgepole Pine Forests

by Lucia Solorzano

Research underway at the Tenderfoot Creek Experimental Forest near White Sulphur Springs will provide insights on how to sustain lodgepole pine forests and water flow patterns over large areas. Lodgepole pine dominates a high percentage of forests in the northern Rocky Mountains, including the Bitterroot National Forest. About half the stands at Tenderfoot are two-aged, resulting from previous fires of mixed severity. However, nearly 120 years have passed since the last major fire. Many of the trees are aging and becoming increasingly susceptible to damage from strong winds, winter kill from rapid and extreme temperature fluctuations, and wildfire.

Tenderfoot Creek is "a classic lodgepole pine community," says Colin Hardy, assistant coordinator of the project, in an area "big enough to make a significant difference in water flow." The Tenderfoot Creek site is especially valuable to researchers because of data already collected on the watershed's hydrology, fire history, weather patterns, soils, fish, birds, and other wildlife.

Two sub-watersheds in the experimental forest are being used in the study. Each has a hydrologically matched sub-watershed that will be left untreated and then compared with treated sites. The headwaters of Tenderfoot Creek will be used as an additional area for comparison.

Treatments will include shelterwood harvests followed by low-severity underburns on some sites, and mixed-severity broadcast underburns on sites that are not logged. Logging will produce two stand structures: evenly spaced, and groups of unevenly spaced trees. The latter structure resembles forests that resulted from historic mixed-severity fires.

Three partners are collaborating on the Tenderfoot project: the Rocky Mountain Research Station, the Lewis and Clark National Forest, and the Bitterroot Ecosystem Management Research Project. Dr. Ward McCaughey of Bozeman is the project coordinator, heading a 12-member planning committee. The study is expected to take about 15 years to complete and already has more than two dozen research proposals related to it.

Prescribed Burn Completes Ponderosa Pine Treatments

by Steve Arno

Logging and exclusion of low-intensity fire have produced thickets of diseased fir trees (interior Douglas-fir and grand fir) in many areas formerly occupied by open ponderosa pine forest in the inland West. One such area is the Bear/Fred Burr Demonstration Site on the Stevensville Ranger District, Bitterroot National Forest. Stumps testify that the original stand, logged in the early 1900s, consisted of large ponderosa pines and Douglas-firs growing in open forest. The stumps record a long history of frequent low-intensity fires.

Researchers and managers are testing six silvicultural treatments, including underburning an uncut stand, in the 60-acre study area. Harvesting took place primarily in 1995; burning was completed in May. One of the main goals of cutting was to commercially remove as much small or diseased fir as possible while leaving an open stand of pine and the healthiest firs. Areas of heavy fuels, such as mistletoe brooms, were burned just as the snow melted (left). A low-intensity burn over the entire area was conducted a week later (below).

These treatments are the first in a sequence to restore the stand. Eventually it should be relatively open, resistant to insect and disease epidemics and severe wildfire. It will have value for aesthetics, wildlife habitat, and watershed protection. It will also produce timber that can finance maintenance costs.

The public is invited to join a field trip to this Demonstration Site on July 29 (see p. 1).

Economics of Restoration Treatments

Can timber products underwrite the cost of ecosystem restoration treatments in ponderosa pine forests? Yes, say silviculturist Carl Fiedler of the University of Montana School of Forestry and Charles Keegan of the Bureau of Business and Economic Research at the University of Montana, if the treatments are designed properly. Fiedler and Keegan designed a prescription for restoring a ponderosa pine/Douglas-fir stand in the Bitterroot National Forest. Their prescription developed a park-like stand of large ponderosa pine by reducing stand density and the proportion of Douglas-fir. This treatment yielded an average of 3.4 thousand board feet per acre, primarily of Douglas-fir, with a net value exceeding \$700 per acre on tractor ground and exceeding \$400 per acre on steep ground requiring cable systems.

An alternative thin-from-below prescription removed nearly all small trees from 5 to 9 inches in diameter. Timber products from this treatment had a negative net value of nearly \$300 per acre. On cable ground, losses exceeded \$500 per acre.

Ecological and economic contrasts between the two prescriptions are dramatic. The first prescription directly addresses fire hazard, declining tree vigor, and species conversion problems, returning substantial revenue. The second is costly and fails to address long-term problems in the stand.



Photos by Steve Arno.

