



# 11 YEARS

# FIRE SCENE



# AFTER

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Immediately after the deliberate burning of two quarter-acre areas in the Coconino National Forest 12 years ago, results looked good:

--Approximately three-fourths of the 1½- to 3-inch-deep forest floor had been consumed, reducing fire hazard considerably.

--Ponderosa pine seedlings established themselves rapidly on the burned areas, occupying approximately 90 percent of the 16, ¼ mil-acre (22.3-inch radius) sample plots in each of the two areas.

--Timber density decreased in both areas, although not to the point considered best for maximum wood production.

Eleven years later, conditions had changed remarkably from what had been observed immediately after the prescribed burning which was conducted on the Beaver Creek watershed south of Flagstaff.

To begin with, the forest floor, consisting principally of pine needles, had recovered some of its depth. In area A, where the burning had reduced the floor to 30 percent of its prefire depth, the 11-year interval saw an increase to 45 percent of prefire depth. In area B, where the fire had cut the floor to 25 percent, the floor had increased to 40 percent of the prefire depth of 3 inches. These depths represent about two-thirds of what might be expected in unburned ponderosa stands of similar density.

The ponderosa pine seedlings that had sprung up so rapidly in the areas burned by the moderate intensity ground fire (flame height about 2 feet), suffered severe mortality in the ensuing years. Only 25 percent of the ¼ mil-acre plots in the burned areas showed seedlings, whereas area A had shown 85 percent following the fire and area B 95 percent. However, the areas adjacent to the burns showed no seedlings in any of the plots, compared with 20 percent and 12 percent on the adjacent areas immediately following the fire.

Timber density changes varied from area A to area B. Area A, which had lost 47 percent of its basal area (basal area represents a cross section of all trees at a height 4½ feet above the ground) and was measured at 90 square feet per acre following the fire, increased in the 11-year interval to 120 square feet. Area B, which had been reduced by 25 percent to 235 square feet per acre by the fire, had further decreased to 210 square feet. The reduction in area B was apparently due to the death of trees that were initially damaged in the fire.

Area A at first lost a greater percentage of its trees because more of them were sapling size, thus

more susceptible to damage by a ground fire than the larger, pole-size trees in area B.

Still, in neither case did the burn reduce density of the trees to 80 square feet per acre, generally considered best for optimum wood production.

It is also impossible to say that 11 years later the fire hazard has been reduced. As anticipated, a great number of twigs, branches, large limbs, and trees killed by the fire have fallen to the ground.

Immediately after the fire, the fall of this heavier material had not taken place and the fire hazard had been reduced both by the consumption of smaller trees and reduction of the forest floor. Perhaps if the areas in question had been treated to burns at regular intervals since the initial fire, the fire-killed trees and limbs would have been consumed and the fire hazard would have remained low.

On both areas, the growth of small plants increased from prefire levels. Area A, where herbage production jumped from 3 pounds per acre to 40 pounds per acre immediately following the fire, was still producing 40 pounds per acre 11 years later. Area B, which produced 5 pounds per acre before and immediately after the fire, increased production to 17 pounds per acre 11 years after being seared.

And where, on both plots, the predominant plant had been the relatively unpalatable mullein, 11 years later a mixture of bottlebrush squirreltail, mutton blue grass, showy goldeneye, red and yellow pea, and buckbrush had taken over.

Even so, the grazing value post fire was not appreciably increased over what it had been.

*The future of prescribed burning in Southwestern Ponderosa Pine seems good. A survivor of centuries of periodic wildfires, Ponderosa should benefit from a carefully prescribed burning program. Prescribed fire is already used to dispose of debris from logging operations and to thin timber stands, with roughly 35,000 acres of debris burned each year on Forest Service land. The use of fire to reduce the pile-up of slash and unwanted brush and small trees requires more skill and probably not more than 6,000 acres of National Forest land are so treated each year.*

*At least three obstacles stand in the way of such a regular, prescribed burning program. These include: (1) lack of people experienced in such burning; (2) difficulty in protecting the forest from runaway fire in areas where fuels such as slash and brush have been allowed to accumulate for several decades; and (3) insufficient funds for such a program of natural hazard reduction. These are not insurmountable obstacles, and considerable progress is being made toward use of prescribed fire as an effective tool in land management.*

Prescribed fire shown burning in 1964 (top left), was followed 11 years later by the conditions shown in the other photos, both of which were photographed on Site A. Note the great amount of fallen trees and branches in the photo at middle right.