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ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

A Survey of an Intentional Burn in Arizona Ponderosa Pine

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As part of a program for learning how to use prescribed fire for land management purposes, 100 acres of Arizona ponderosa pine were intentionally burned on the Coconino National Forest at Buck Mountain, 40 miles south of Flagstaff, on November 24, 1959.

The results of the burning were surveyed in July 1960 [2] by the methods reported by Lindenmuth.[3] Sampling intensity was one plot for every 0.4 acre.

Burning Conditions

Forest flammability measurements were as follows: drought index[4] was moderate (70) and rate-of-spread index was low (10). Pine understory was dense. Twenty-three percent of the area had a potential for supporting crown fire during moderate drought index and low to moderate rate-of-spread index conditions.

The area was burned in one afternoon during relatively stable burning conditions. Ignition was by strips 20 feet apart.

Fire Intensity

Most of the area burned lightly or not at all. Percent distribution was as follows:

[1] *Associate Forest Fuels Specialist, located at the Station's project headquarters at Flagstaff, in cooperation with Arizona State College; central headquarters are maintained at Fort Collins in cooperation with Colorado State University.*

[2] *Measurements were made by forestry students from Arizona State College under the direction of Dr. M. B. Applequist.*

[3] *Lindenmuth, A. W., Jr. A survey of effects of intentional burning on fuels and timber stands of ponderosa pine in Arizona. U. S. Forest Serv., Rocky Mountain Forest and Range Expt. Sta., Sta. Paper 54, 22 pp. 1961.*

[4] *Lindenmuth, A. W., Jr. Development of the 2-index system of rating forest fire danger. Jour. Forestry 59: 504-509. 1961.*

	Burnable area	Burned area
	(Percent)	
Fire intensity class:		
Did not burn	37.8	0.0
Light surface fire	48.6	78.2
Hot surface fire	11.3	18.2
Crown fire	2.3	3.6
Total	100.0	100.0

Effects on Understory Trees

Because of the dense understory, many potential crop trees needed release. Only a small proportion of the area crowned or burned with a hot surface fire, however, so few were released.

Percent of total potential crop trees:	
Needing release	44.9
Released	4.3
Percent of those needing release that were released	9.7

Since overall fire intensity was low, few understory trees were killed or damaged. The proportion of plots stocked with understory trees was reduced by 5.5 percent. On an additional 5.1 percent of all plots the stocking was damaged. The best potential crop tree on the plot was either damaged or killed, which left the plot stocked by a less desirable tree.

Forest flammability conditions for the Buck Mountain burn were similar to those for the 27,000-acre burn reported by Lindenmuth.[3] Similar proportions of the two areas were found to have burned by light surface fire, hot surface fire, and crown fire. The similarity of the two burns suggests a pattern of fire intensity that can be expected in low-intensity or "cool" burns.