

# Removal of Tinder in Ponderosa

prescribed burning of forest brush during the wet season by tested methods effectively reduces hazard of wildfire

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**Dead material** in second-growth ponderosa pine is one factor contributing to destructive uncontrolled fires in summer.

Techniques of prescribed burning—as demonstrated in studies of brush management for game habitat improvement during the past four years—can reduce the tinder material in a forest and lower the fire hazard.

In the use of fire as a game range management tool in second-growth ponderosa pine brush, the conditions for firing are planned in advance.

Prescribed burning means that fire is used—for some definite reason—in one or more of four steps: 1, broadcast burning; 2, piling of coarse material by hand and burning; 3, crushing with bulldozer in open areas and burning; and 4, pruning of dead limbs and burning. Such burning is done only in the fall, winter, and spring when the soil is thoroughly wet and the hazard to wildlife is relatively low.

In broadcast burning, the pine needles furnish the fuel to carry the fire and are essential to its success. The surface pine needles may be sufficiently dry to carry fire within a day or so after rain. The fire is then set so it will burn downhill. Demonstration has shown that a fire on some slopes will burn lightly downhill but on the same slope may burn out of control if allowed to burn uphill. Broadcast burning is largely a skill best gained through experience and actual practice.

The broadcast fire does well when the relative humidity is about 25% and the air temperature 65F or below. A slight breeze is desirable. In areas of flash fuel and much dead material that has accumulated over many years, the lower needles must be wet and the fire must be particularly light or else the heat may become too intense for the trees.

After broadcast burning, the remaining coarse material is piled and burned in numerous open spots. This is done in areas of dense trees. The technique is to start a small fire and to gradually add the fuel as it burns. Studies of time required to do this work have shown that one person can pile and burn about 1,000 pounds per hour. Because this operation follows the broadcast burning, it can be done under a wider range of weather conditions since the fire hazard has already been decreased.



About 25,000 pounds of dead brush and 25,000 pounds of living brush per acre make for high fire hazard on this southwest facing slope.



Above: Broadcast burning. Pine needles furnish the fuel to carry the fire. Due to dense smoke, the picture was taken slightly to the left of photo station. Below: Crushing brush with bulldozer in area of scattered trees.



In areas where the trees are scattered and a bulldozer can be maneuvered among them, it is used to crush brush. After the brush is dry it can be burned broadcast.

Dead limbs should be pruned, piled, and burned with the coarse material left by broadcast burning.

The fire hazard can be reduced still more by thinning trees to the approximate proper stocking. Such stands produce about 750 pounds of dead needles per year, whereas in a heavily overstocked stand it is about 1500 pounds. Many of these dead needles are on the trees at the height of the critical fire season in late summer.

In strategic areas it may be desirable to perform all of these steps, but in many other places two or three broadcast burnings in yearly succession may destroy enough of the dead material to reduce the fire hazard to a satisfactory level.

Simple tests were made to determine the effectiveness of broadcast burning in reducing the fire hazard during the following summer. On test day in late June the relative humidity was 64% and the air temperature 60F, but the heavy fuel in untreated areas was dry to the mineral soil. Even under the relatively low fire hazard conditions, fires started in the untreated areas burned fiercely.

Lighted kitchen matches were thrown into the needles, landing no less than three feet from each other. Where these started fires and the fire went out before a spot had burned 12" in diameter, the test was considered negative, or fire-out; where fires expanded to more than 12" spots, the test was considered positive. The results are given in the accompanying table and show clearly that broadcast burning in the spring has a very positive effect in reducing the ease with which fires start in the summer. Broadcast burning in November before the needle fall was complete also reduced the number of fires that spread.

In the past four years, two small wildfires have occurred on treated areas, one on August 20, 1954, in two-year-old needle fall, the second on April 12, 1955, in one-year-old needle fall. Both fires were easily controlled. No trees were killed and the lower leaves were scarcely scorched. Measurements of needle fall on burned areas compared to those unburned confirm this observation, as indicated in the graph.

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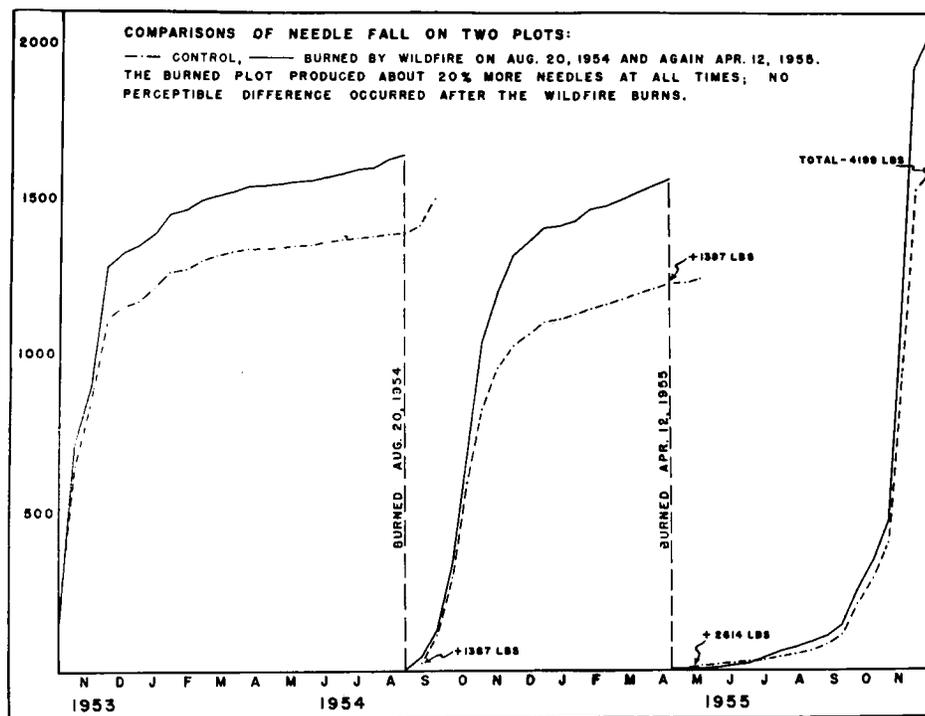
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### Hazard of Wildfire Reduced by Prescribed Burning

Treatment	No. of test	No. of matches thrown	No. of times fire went out	No. of times fire expanded	Per cent of times fire went out
Unburned (check)	1	8	3	5	37.5
Approx. wt. of needles on ground per A. = 11,500 lbs.	2	8	0	8	0.0
	3	9	2	7	22.2
					<b>Ave. = 20.0</b>
Broadcast Burned Nov. 17	1	8	7	1	62.5
Approx. wt. of needles on ground per A. = 475 lbs.	2	8	1	7	62.5
	3	9	2	7	22.2
					<b>Ave. = 48.0</b>
Broadcast Burned Apr. 5	1	8	8	0	100
Approx. wt. of needles on ground per A. = 42 lbs.	2	8	8	0	100
	3	9	9	0	100
					<b>Ave. = 100</b>



Brush removed—fire hazard reduced. Arrow indicates tree beside which bulldozer was crushing brush in the photograph at the left.

