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RESEARCH NOTES

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Fire-killed

at Pringle Falls

HOW LONG DO PONDEROSA PINE SNAGS STAND?

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How long will the average ponderosa pine snag remain standing and thus contribute to greater rate of spread and resistance to control of forest fires? Are there any readily discernible characteristics that will enable us to predict which will fall soon and which will stand for a long time?

To answer these questions a 15-acre plot was installed in 1937 on the Pringle Falls Experimental Forest. The area had been accidentally burned in 1926. Before that time it was covered with an average stand of mostly mature ponderosa pine growing on a deep pumice soil. In 1937, 95 snags were standing; but from a count of down ones, both on and off the burn, it was estimated that 212 were standing immediately after the fire. It is not known whether all of these trees were killed by fire or not, but certainly most of them were.

Ten years after the fire a little over half of the snags were down and 22 years after the burn 78 percent of them had fallen. The rate of falling (fig. 1) indicates that at least a few are likely to remain for many more years.

The smaller snags tend to fall sooner than the larger. This is indicated by the fact that the down snags average 22 inches in diameter inside bark; the fallen ones average 26 inches in diameter. However, all small snags do not go down promptly. As shown in table 1, the smallest (8 inches d.i.b.) is still standing.

Table 1.--Distribution of standing and down snags by diameter class

Condition of snags	Diameter class - d.i.b. in inches																		
	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	Total
Standing 1948	1	0	0	5	2	2	1	4	6	5	4	5	2	4	3	1	0	1	46
Down 1926-36 (estimated)	0	0	37	16	16	19	3	5	5	3	5	5	0	3	0	0	0	0	117
Down 1937 & later	0	7	2	4	3	4	5	5	2	4	5	2	2	1	0	1	1	1	49

Comparison of the results of this study with those obtained by McArdle^{1/} in studying Douglas-fir snags indicates that pine snags tend to stand a shorter period of time, perhaps by several decades, than do fir snags. Also, the pine snags tend to fall by uprooting rather than by decaying and breaking off piece by piece from the top as do Douglas-fir snags. However, when pine snags do break off from the top, their chances of standing longer than average are increased. This is indicated by the fact that the fallen pine snags average 10 feet longer than those still standing. Since the fallen pine snags average 4 inches smaller in diameter, they were undoubtedly considerably shorter than the standing snags originally were.

The amount of bark on snags is useful as a criterion in determining how long they have been standing dead, only when applied to averages of large groups. This is shown by the wide range in amount of bark remaining on the 46 snags still standing in 1948. Following is the distribution of snags by bark percentage classes:

<u>Percent of bark remaining</u>	<u>Number of snags</u>
None	15
1 - 25%	14
26 - 50%	5
51 - 75%	6
76 - 99%	5
100%	1

^{1/} McArdle, R. E. Overtopping of Douglas fir snags by reproduction. Pacific Northwest Forest Expt. Sta. Forest Research Notes 8: 6. December 11, 1931.

Pine snags resulting from insect kills, reported by Keen^{2/} also showed a tendency for small ones to fall first. But the "fire snags have tended to stand longer than the "insect" snags. At the end of 9 years 75 percent of the "insect" snags were down, but it took 18 years for the same proportion of "fire" snags to fall. It is not known whether this difference is the result of the way the two groups were killed, the tendency of insects to select certain types of trees, the differences in soil, or a combination of these factors. In any event, the pine snags on pumice soils at Pringle Falls will constitute a fire hazard for a much longer period of time than has been generally expected.

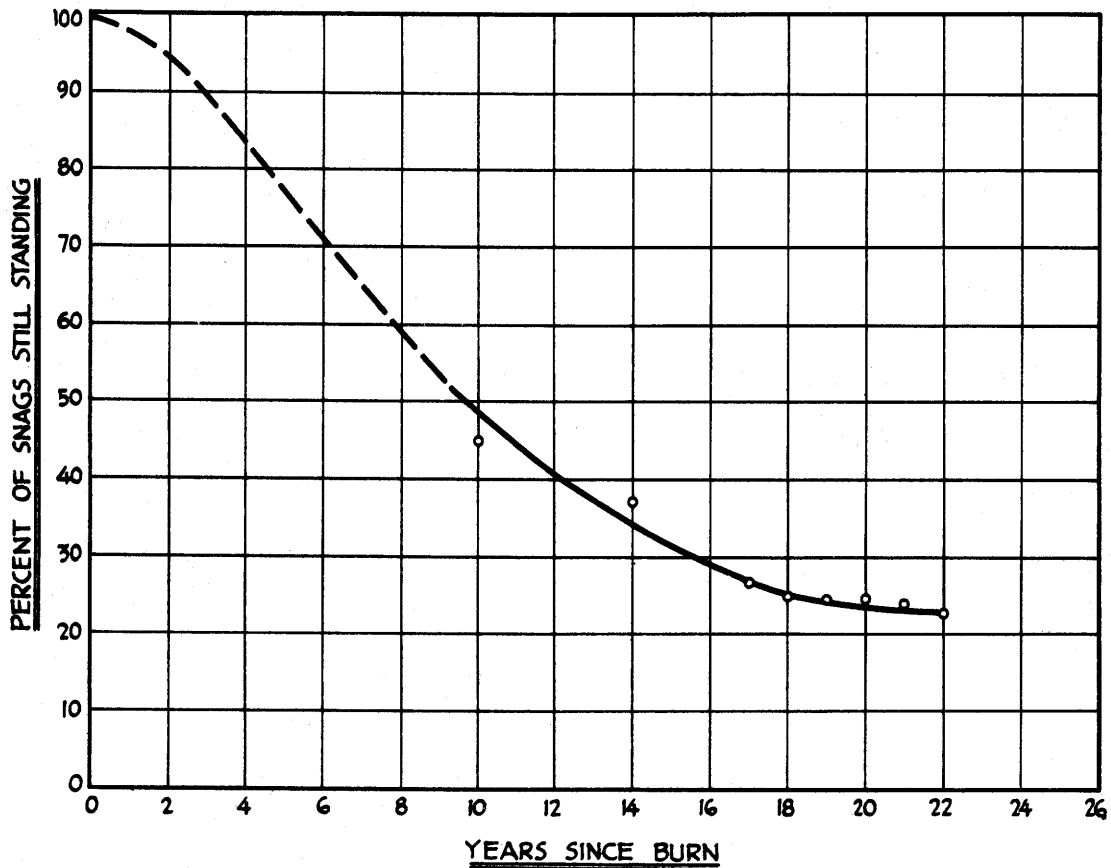


Figure 1. Rate of Snag Fall.

^{2/} Keen, F. P. How soon do yellow pine snags fall? Jour. Forestry 27: 735-737. October 1929.