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LIGHT BURNING IN CALIFORNIA FORESTS.

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There is much discussion just now about the best methods of protecting forests against fire. There is one theory, in particular, of which much has been heard lately in California. This idea, briefly, is that the forests should be burned over lightly in the spring or fall in order to get rid of the brush, undergrowth, and ground rubbish, so that fires which start during the dry season will not have this material to feed upon. In other words, the theory contemplates a cleaning up of the ground by means of fire. The advocates of this theory attack the Forest Service for not putting such a plan into effect on the National Forests.

The Forest Service uses fire to a large extent in cleaning up its lands. In all timber sales on the National Forests of California the slashings are lopped, piled with the smaller refuse, and burned after the first rains of fall. As the Service is selling annually some 200,000,000 feet of timber, it will be seen that this cleaning-up process covers no inconsiderable amount of land. Even after such careful preparation it is an exceedingly delicate operation to burn the slashings in such a manner that the fire will not spread. Outside of the redwood belt (where conditions are wholly different from the pine lands) there are only two lumber companies in the whole State of California which make any attempt to burn their slashings. These unburned slashings on private lands to-day are the greatest menace to standing timber, both Government and private.

As a matter of fact, therefore, the Forest Service is almost alone among owners of pine timber in California in its use of fire as a servant.

A great deal is heard nowadays about the old burns made by the Indians. It is said that such fires were "light" burns, and were a good thing for the forests. There is ample evidence throughout the whole State to prove the contrary.

The old Indian fires wiped out almost all of the young growth of timber in their paths, did an immense amount of damage to mature timber, and, what is more serious, changed vast areas of valuable

timberland into worthless brush and chaparral slopes. This is not theory but fact. Its proof is evident to anyone with the opportunity for traveling in the mountains and the ability to see things as they exist on the ground to-day. The transition from well-stocked timberlands to dense brush areas wholly devoid of trees is everywhere at hand and may be viewed in all stages. Only the most casual observation is necessary to determine the fact that fire is responsible. On the National Forests alone, in California, there are approximately 2,000,000 acres of land which formerly supported excellent stands of timber, and which, after repeated ravages from these old Indian fires, are now nonproductive wastes of dense brush.

It might be added also that the forests which have withstood these ravages are greatly thinned out as a consequence. It is conservatively estimated that fire has reduced the existing merchantable stand of mature trees 35 per cent of their original volume. Evidences of this also are clearly apparent on the ground.

A most common error is due to the belief that, because 10 or 15 mature trees per acre may be what we now call a good merchantable stand, 10 or 15 young trees per acre are all that we need to have on the ground in order to give us eventually this number of mature trees. Those holding this belief entirely overlook the fact that our 10 or 15 trees, if they are worth anything for lumber, are the final result of the struggle for existence of many hundreds and often many thousands of young trees. If we should start with 10 or 15 trees they would grow up to be short, crooked, and limby, covered with branches almost to the ground, and worthless for lumber. It is the fight for light among hundreds and often thousands of young trees which forces the most vigorous of them to shoot up to great heights and which prunes the stems clear of all branches. Out of this struggle come at last our 10 or 15 mature trees—tall, straight, clear stemmed—which give us our square timbers and clear lumber.

So we must keep the young growth thick upon the ground if we are to get good merchantable timber from the mature trees in the end. We must prevent fire from killing or injuring this young growth. Too often the advocates of "light burning" class the thickets of small trees as brush or litter and either aim to get rid of them or are indifferent as to what becomes of them. This is not forestry. It is plain destruction.

Another point to be considered is the way in which a good stand of timber eventually lessens the fire risk. While pine stands in the thicket stage are dangerous and require most careful protection against fire, as they develop into the pole stage and clear themselves of their lower branches, they soon kill off, by their dense shade, most of the brush and other inflammable growth under them, leaving the ground clean, and thus protecting the forest against the spread of fire.

It is said that fires will run through the timber in spite of all that can be done. This is not true. Fires will start whatever may be done, but it is quite another matter to say that they will run. Little fires, quickly put out, do little or no damage. Big fires, which do the damage, start from little ones. If little fires can be squelched before they have a chance to run, all serious damage may be prevented. This has been done in California for the past 10 years with excellent success. The damage to Government timber, even during the past exceptionally dry season, has been small. Protection can be made even more effective with more men during the danger season, more telephone lines, and more trails; and it will soon result that the fires which start will run even less than they do now. This method of squelching little fires at the start, and thus preventing big fires, is not by any means based upon theory. It is a method which has been actually practiced with entire success in the Old World for from 50 to 100 years, and in many regions, too, where the control of forest fires is much more difficult than in California.

The Forest Service is not opposed to any system which will make fire protection more efficient. On the contrary, it will advocate and urge any practical methods which tend to make protection against fire easier and surer. It is all the time seeking new and better methods. It is ready to take up every promising suggestion, test it, and work out the best way of using whatever proves to be of value. Surface burning can undoubtedly be applied advantageously under some conditions and in a limited way. Such ways include the burning of fire lines in open stands, and also the cleaning up of old slashings. Wherever light burnings prove to be the best means of reducing the fire risk, consideration being had of the effect upon young growth and soil erosion, if the expense of the cleaning up and burning can be met with the appropriations given by Congress the Forest Service will adopt the method most gladly and most promptly. Such a working out of the field of application of surface burning is, however, a very different matter from what the advocates of the light-burning theory have in mind. What they propose is that a general burning over of the forests should be substituted for the present methods of protecting them. Such a proposal is entirely visionary, because it fails to take into account the basic facts in the situation.

It should never be forgotten that it is the duty of the Forest Service not only to protect the present forest, but also to bring to maturity the forests of the future, and that it can never adopt a system of burning which would seriously interfere with this object. In other words, it can not sacrifice the future stand in order to attain some possible added protection to the present mature timber.

A study of light burning as practiced by a private timber owner in California brings out three facts:

First.—In order to have any permanent effect “light burning” must be practiced at least every three or four years.

Second.—Where the conditions of moisture, litter, etc., are such that “light burning” will work successfully—that is, burn—practically all trees up to 10 years old are killed and over 50 per cent of those up to 30 years of age. It is clear, then, that if we should make general use of “light burning” in our mature timber, we should be compelled to abandon the most important thing we are working for, which is to keep the land producing trees continuously. Unless we save the young trees there will be no mature timber in the future.

Third.—The cost of the light-burning process was, by the owner’s figures, approximately 50 cents per acre. There are 8,000,000 acres of good timber land in the National Forests of California and western Nevada. At this rate “light burning,” say, every four years would mean an annual expenditure of \$1,000,000 or more in this State alone. Congress would probably consider this cost prohibitive. Furthermore, if this amount were available in addition to our ordinary appropriations, the Forest Service could employ 2,500 fire guards instead of 400. Even though the cost of preparing the land when done systematically could be reduced to but a fraction of 50 cents per acre, as some of its advocates believe it might be, there is no ground for holding “light burning” preferable to the method which aims to keep fires out. The annual loss from fire could be stopped with far less than 2,500 men, and that without the destruction of young tree growth.

Summed up, the position of the Service is this: It has used fire to clean up the ground much more extensively than any other lumber interests in California. Practical experience shows that it is safe to use fire for such purposes only under careful restrictions. Unless the ground is carefully prepared beforehand, a so-called “light burning” will destroy most of the young growth and do serious damage to much of the mature timber. Where the young growth is first starting, any fire at all which runs through it is fatal. The expense of proper preparation combined with the necessity of preserving young growth makes it out of the question regularly to clean up and burn large areas other than lumbering slashes. So far as knowledge and experience go, the plan for “light burnings” can not be put into practice on pine lands at a reasonable cost on any extensive scale. If there is anything in the plan which is found to be applicable to National Forest conditions and ends, it will be adopted wherever it can be made to yield good results.