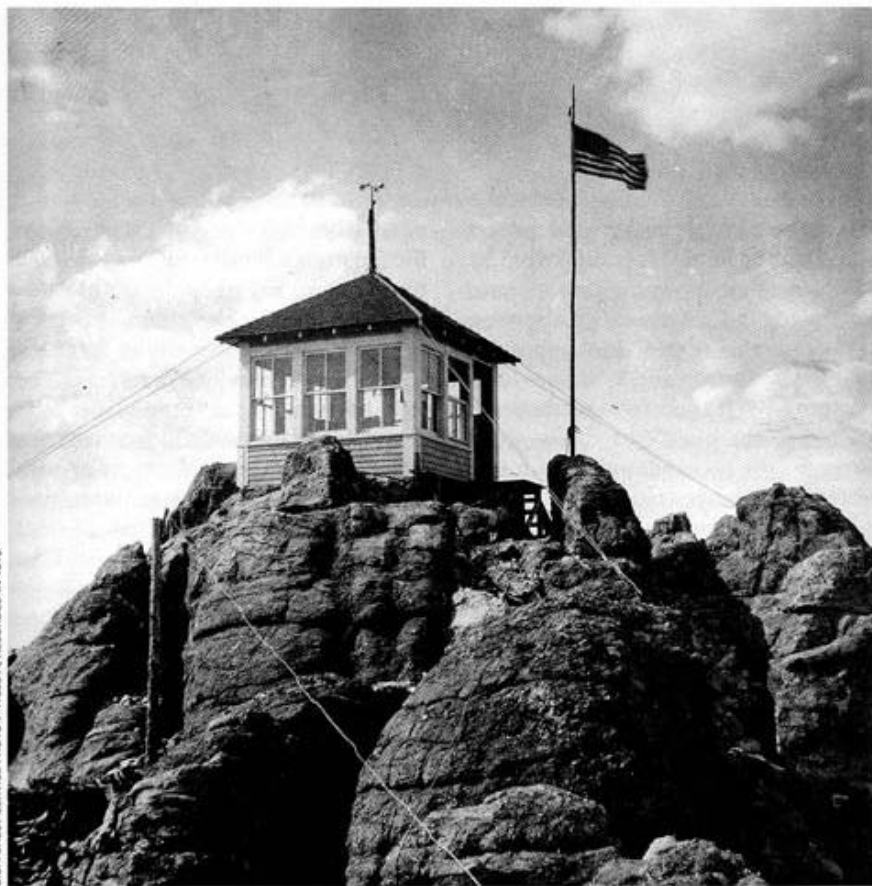


Light burning, or what we call prescribed burning today, remains controversial, as one measure proposed to improve forest health. Nearly 30 years after Greeley wrote this article, the United States Forest Service established a policy for prescribed burning, with Southern forests in mind. The Ocala National Forest in Florida plans to commemorate the Fiftieth Anniversary of the policy this autumn.

“PIUTE FORESTRY” OR THE FALLACY OF LIGHT BURNING

BY WILLIAM B. GREELEY, ASSISTANT FORESTER, UNITED STATES
FOREST SERVICE FROM THE TIMBERMAN, MARCH 1920



U.S. FOREST SERVICE PHOTO # 41580 A, RECORDED IN 1919

Lookouts established by the U.S. Forest Service helped to detect forest fires. This station, on Harney Peak, in Custer County South Dakota, enabled the lookout to scan miles of Harney (now Black Hills) National Forest land.

For nearly 20 years a drive has been made in the western states to put an end to the destruction of forests by fire. This effort has been backed by many timber owners and by state and municipal agencies with a fine spirit of co-operation. From year to year it has received more widespread support in public sentiment.

The goal of this effort has been to keep fires out of the forest. It has sought to make the woods as fireproof as practicable through the disposal of slashings; to reduce the number of man-caused fires by state control of the use of fire and by creating a public sentiment wide awake at all times to keep fire out of the woods; to detect small fires quickly by patrols and lookout stations; and to put fires out by the systematic organization of all the forces available in an emergency.

In a large measure the effort to stop destructive forest fires in the western states has been successful. Millions of acres of both private and public forests have been efficiently protected. Thousands of small fires have been put out before doing serious damage. Many thousands more have been prevented through law enforcement and the educational campaign which has enlisted the support of the hunter, the camper, the logger, the railroad operator, the herdsman and the settler. The effort has not

prevented all forest conflagrations in seasons or localities of extreme drought. It has not yet solved certain problems in protecting forests which are still inaccessible stretches of wilderness or which are still undermanned or which are subject to exceptional hazards by reason of local climate or local social and industrial conditions.

Bad fires still occur in European forests which have been under systematic protection and management for 200 years. We can expect no less in the inaccessible and thinly populated portions of our western states, which are exposed to climatic fire hazards as extreme as exist perhaps in any portion of the world. To condemn the methods of protecting the western forests because they have not prevented all fires would be as sensible as to condemn the fire-prevention work of our large cities because of the occasional Baltimore, San Francisco or Chelsea fire. The protection of our western forests from fire, in which work timber owners and associations have taken a leading part, is one of the finest accomplishments in forestry yet witnessed in the United States. One of its best features is that it has been brought about largely by the people of the western states themselves, and that its greatest asset today lies in the public sentiment of the West to keep fires out of the woods.

WHAT THE FOREST BURNERS PREACH

It would seem unnecessary to uphold the protection of our western forests as a work commanding the support of every forester and timber owner in the United States, but a propaganda is now being preached which subtly strikes at the very roots of it. The advocates of light burning, or "Piute forestry," assert that fire should not be kept out of the pine forests, by all odds the most extensive in our western states. Instead of keeping fire out of the western pineries, the advocates of this system propose to burn them regularly every few years. They claim that a succession of light fires will keep these forests clean of inflammable material without injury to the merchantable stumpage. The frequent burning up of small growth, underbrush and litter supposedly would thus protect the woods from serious conflagrations.



U.S. FOREST SERVICE PHOTO # 23991, TAKEN BY HENRY S. GRAVES, 1898.

A light burning fire in a Western yellow pine forest on the Harney (now Black Hills) National Forest near Hill City, South Dakota. Chief William B. Greeley opposed such burning, by the time he wrote this article in 1920.

It is even claimed that pine forests protected by this system will not burn, that their young trees will not be seriously injured; and the whole thing is to cost but a fraction of a cent per acre. This system is advocated by the Southern Pacific Railroad, which, because of its enormous federal land grants, is one of the two or three largest timber land owners in the United States. It is supported by other large timber-owning corporations, particularly in California. Light burning has been preached in articles appearing in *American Forestry* and in various lumber journals. It is, in fact, a substitute offered to the people of the western states for the present system of forest protection which has hitherto made such splendid headway.

The light burners claim that their scheme was practiced by the Indians in various western pine forests long before the advent of the white man, asserting that the noble redskin fired the forests regularly, not so much to facilitate his hunting or protect his dwelling as because his nature lore taught him that this was the way to prevent the "big" forest fire. Their scheme means nothing more or less than a continuation of the frequent ground fire which, whether started by Indians or by lighting, swept over many of our western pineries at frequent intervals prior to the coming of the whites and which was continued by

the early hunters, prospectors, herdsmen and settlers.

FIRE CONDITIONS IGNORED

The light burners proposed to "control" the destructiveness of the deliberate firing by burning the woods in the spring or fall when sufficiently moist to prevent the fire from seriously injuring either old timber or young trees. A careful study of the area where this system has been intentionally practiced shows that such control amounts to little or nothing. The light burners ignore certain basic facts about fire conditions in our western pineries. They ignore the rapidity with which evaporation under intense sunlight in warm weather dries up the litter in the pine woods. A south slope will be so dry as to make any fire exceedingly hot and destructive before a north slope will burn at all. Areas which will burn but lightly and irregularly early in the morning will flare up and consume in the most approved fashion by mid-afternoon. The moisture following light spring or fall rains often disappears so rapidly that the period of "safe" burning is a matter of hours, not of days. Actually to burn the western pineries, as the advocates of this theory propose to burn them, would, if it could be done at all, entail a cost for effective control many times greater than the cost of an efficient



A forest ranger hikes through the ravaged remains of National Forest land, after a major fire.

system of fire detection and suppression.

Light burning, in actual practice, is simply the old ground fire which has been the scourge of the western pineries, under a new name. Its use means a deliberate continuation of the destructive surface fires which were steadily and irresistibly eating up the pine forests of our western states until they were placed under protection. In every western state without exception, the pine forests have been thinned out, cut down in area, replaced here and there by brush or grass land, have often become diseased, and have lost much of the young growth which normally they should contain, as the result of fire. This has not been brought about by a few large conflagrations. It is the cumulative result of one fire after another extending over a period of 50–100 years. Every time a fire runs over these areas a few more old trees are hollowed out at the base so that the next high wind topples them over, a few more fine logs become infected with rot

through surface scars, and more of the young growth by which nature constantly seeks to recover lost ground is crowded out by brush. If surface burning is not stopped, the end is total destruction, a destruction which, though less spectacular, is just as complete and disastrous as when a forest is consumed in a crown blaze that kills everything at once.

SOME FORESTS TOTALLY DESTROYED

The total destruction of pine forests has actually been caused by repeated firing in many parts of the West. The National Forests of California alone, where light burning is most strenuously advocated, contain nearly two million acres of pure brush patches which formerly were heavily timbered. These brush patches cover nearly 14 percent of the timber belt in the National Forests of that state. That they were once pine forests is fully attested by the occasional snag or half dead tree still

left standing, by the charred stumps, by tree roots half rotted in the ground. Those brush patches represent a loss to the forest resources of California today which we can safely put at 37 billion feet of standing timber, with a value of probably \$75,000,000; and that loss will go steadily on if light burning of the pine forests is permitted. In many other pine areas the stand of timber is not only much less than it should be because of frequent surface fires but has been reduced in volume and quality by disease which follows in the train of the fire. Incense cedar is one of the important trees in the California pine forests, but its timber is so defective that the lumberman has often been unable to log it at all. An intensive study of sample areas has shown that 84 percent of the rot in incense cedar is traceable directly to fire scars. A large proportion of the loss in volume and quality of pine stumpage, which is a normal thing in practically all western pine camps is due to the same cause.

Aside from the gradual wiping out of the mature timber in these virgin forests, the system of ground burning effectively cleans them of young tree growth. If all of the seedlings and saplings are not destroyed in the first or second fire, the third or fourth fire completes the job. It is absolutely impossible to ground burn large areas repeatedly and save any young growth on them. The actual fires of the light burner prove this, whatever he may claim. As a matter of fact the light burner does not want young growth. It is part of the inflammable debris which he would get out of the forest as to render a "serious" conflagration impossible. When the mature timber in a light-burned forest is cut, the forest is at an end. Its productivity ceases. It becomes a brush patch.

LIGHT BURNING MUST BE REPEATED

This is the real issue which has been raised by the advocacy of light burning. The best that can be said for the system is that it is a means for protecting mature timber, although at considerable loss in the stumpage projected, supposedly more cheaply than by an efficient system of detecting and putting out fires. Experience has shown that to protect the mature timber, light burning must be repeated regularly at least every three or four years. At every burning a lot of brush and young trees are killed but remain on the ground, furnishing the most inflammable of fire food. They must be removed by a later burning, which in turn leaves a certain amount of dead and inflammable material in its wake. The accumulation of litter from the needles and twigs of old trees, in itself, destroys the protective value of a light fire in three or four years. To carry out this theory of protecting old timber, the ground must be burned again and again and again. It is preposterous to assert that young trees can survive this process.

In other words, let us recognize frankly that light burning is simply part of the game of timber mining. To the gutting of heavy cutting it adds the gutting of total destruction to young growth. To cheapen the protection and utilization of old timber, it deliberately transforms the forest into a brush patch.

The issue raised by light burning is not what its advocates claim—the utility of fire properly controlled as a means of forest protection. Everyone recognizes the utility of fire if properly controlled. The burning of slashings on cut-over land is often essential not only to eliminate a menace to adjoining stumpage but also to protect young growth already existing on the cut-over land. It may even be wise to burn up some of the existing young growth in order to clean up the slashings and give the area greater safety from future fires. In Douglas fir areas in the Cascade range, where the new forest must be grown from seed in the ground, it is good forestry to burn an entire cut-over area cleanly under careful control. In most of our spruce, balsam and hardwood forests, part or all of the new timber growth is or should be on the ground at the time of cutting. If the land is not to be denuded and its productivity brought to an end, that young growth must be preserved as far as possible and the firing must be done so as to preserve it.

If the only solution lies in the uninterrupted destruction of young growth by light burning, we had better harvest our mature stumpage without more ado and then become a wood-importing nation.

The issue raised by light burning is rather whether or not our forest protection in the West is to be the kind of protection which conserves and promotes tree growth, or whether it is to be simply an adjunct of timber mining. It is for this reason that I stated with conviction at the beginning of this article that light burning strikes at the roots of

our forest protection effort in the western states. The people living in and near the western pineries have been taught to believe that fire must be kept out of the woods. To a surprising degree they have recognized the truth of that slogan. They have supported state legislation and private associations based upon that principle. They have come to believe that fire and forest growth do not go together. Their support of a genuine system of forest protection has been not only to save their virgin stumpage but also to perpetuate their vast pineries which mean so much to the economic future of the West.

INCENDIARISM GETS ENCOURAGEMENT

Now comes an insidious doctrine telling everyone that this system of fire protection which has been built up with so much effort is unnecessary; that all we need to do with our western pine forests is to "touch 'em off." The plausible arguments advanced in advocacy of light burning make this proposal exceptionally dangerous. It weakens the confidence of the general public in real fire protection. It weakens the support given by timber land owners to organized protective efforts such as state and federal agencies and many associations have been successful in bringing about. It tends to block progressive fire legislation in the western states. It tends to encourage incendiary fires by the settler, prospector or stock grower who has reasons of his own for wishing to clear the woods. It is a direct challenge to a national policy of forestry for it strikes unmistakably at the effort to keep timber lands productive rather than permit them to become waste.

It goes without saying that we all recognize the difficulty in protecting the western forests efficiently from fire. If the only solution lies in the uninterrupted destruction of young growth by light burning, we had better harvest our mature stumpage without more ado and then become a wood-importing nation. But that is not the solution. Billions of acres of National Forest pine lands demonstrate the results of 15 years of successful protection from ground fires. In these forests the brush patches are disappearing in thickets of vigorous pine



The Holland Peak fire guard reporting a fire on the Flathead National Forest, Montana.

reproduction. The actual growth of timber has been increased several times over what it was during the days of periodic fire. Not only is the merchantable stumpage fully protected but the growth needed to supply our future requirements is now taking place

We can have real forests, full of growth and promise for the future, in our pineries generally if all interests get behind a real program of fire protection. This means a harder and more united effort by all agencies, public and private. It means progressive state legislation which will require the disposal of slashings on cut-over lands and enlist all forest owners in organized fire prevention. We should also have federal legislation which will give the Forest Service much greater resources for co-operating with local agencies in fire protection.

FIRE PROTECTION WANTED

Doubtless we cannot absolutely prevent the occasional destructive forest fire any more than it has been possible to prevent

it in the European forests. A considerable portion of southern Europe has a fire problem analogous to that in the western United States. This protection problem has not been solved, as certain advocates of light burning assert, by the custom of making fagots from limbs and twigs. Fagot making is a negligible factor in European fire protection for the same reasons that it would be in the western United States, because it has such a relatively small effect upon the actual inflammability of the forest. Fire protection has been brought about in southern Europe by the same methods through which it must be brought about in the western United States, by an organized system of detection and suppression, in which improvements and intensive use of the forests are the principal factors. And still southern Europe has its occasional bad fires which are just as destructive as any that have occurred in the western pineries.

We can, as in Europe reduce the destructive fires to a negligible average or aggregate loss if our efforts are con-

centrated upon a genuine system of fire protection. The only kind of protection which this system must admit is one which promotes the productivity of our forest lands in the long run. In building up this kind of forest protection, the public has the right to expect the co-operation of the large western timber owners who have acquired enormous holdings under the liberal policy of the government in disposing of its public domain, and particularly of the large railroad companies whose enormous grants of public timber land should be regarded as a public trust.

We should no more permit an essentially destructive theory, like that of light burning, to nullify our efforts at real forest protection than we would permit the advertisement of sure cures for tuberculosis to do away with the sanitary regulations of cities, the tuberculosis sanatoria, fresh air for patients, and the other means employed by medical and hygienic science for combatting the white plague. □