FORESTRY LESSONS TAUGHT BY THE GREAT FIRES

EFFECT OF WIND AND FIRE IN HEAVY TIMBER OF UPPER ST. REGIS RIVER NEAR BORAX—LOLO FOREST—WHITE PINE AND SPRUCE TIMBER.

IN THE COEUR D'ALENE FOREST NEAR WALLACE FOLLOWING HURRICANE AND FIRE OF AUGUST 20

A cigarette butt, a careless camper, a spark or a bolt of lightning—one is about as dangerous as the other and as great a menace to the national forests during the summer months when the vegetation and timber are dry and so easily ignited. Forest fires originating from all of these sources, and possibly a few purposely set by malicious-minded persons, caused a terrible loss of life and property during the dry season of 1910. A conflagration bearing such disastrous results has never occurred and its visitation has broken the indifference of the general public as well as the special interests and by illustrating so vividly the vital necessity of a better system of fire protection it may work out the salvation of the remaining forests.

"No great loss without some small gain" may be applicable to the case if the disaster of the season shall bring forth a system of adequate fire protection. However great the gain may be in the system it must be considered small when compared with the lives of 80 or more men who perished in the flames. Forests may be replanted and grown again but those men can never be recalled.

With the headquarters or field district No. 1 of the forest service located in Missoula and the administration of 28 national forests centering at these headquarters, a splendid opportunity has been given here for a study of this fire situation. Naturally the matter was of much interest to the forestry officials and the various phases of it have been the subjects of much discussion and a great many of the suggestions about to be offered have come from men within the forest service. Some of the features of the plan outlined are already in operation and much of the data herein contained has been gleaned from an investigation of the records of experimental work conducted by the service along these lines.

The great necessity, however, is to perfect a general plan large enough to cover the whole situation and then to secure an appropriation from the national congress which will be ample to put it into execution in the immediate future.

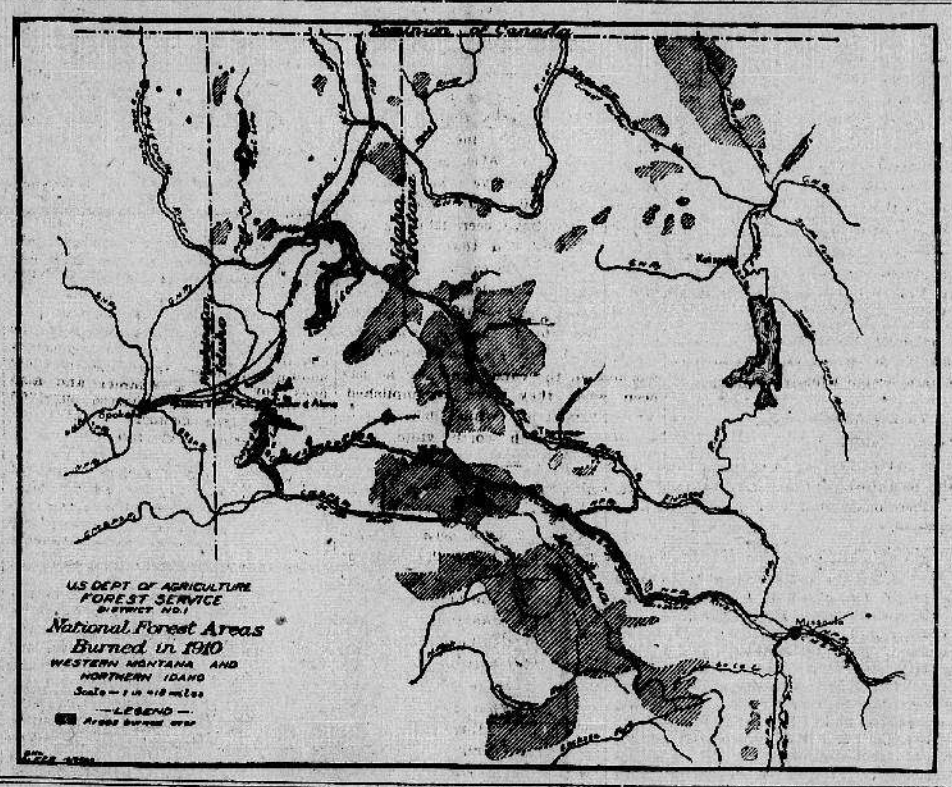
Field District No. 1.

In order to appreciate the serious fires which occurred in western Montana and northern Idaho it is necessary to understand the conditions and extent and type of country in which they occurred. Field district No. 1 of the forest service includes all the national forests in the panhandle of Idaho north of the Salmon river, all in Montana, North Dakota, Michigan and Minnesota. The type of country offers two areas in distinct contrast, one lying east and one west of the great Continental divide. That to the east is open with the timber mostly confined to the north slopes and interspersed with large open parks and grassy areas. The yellow pine, red fir and lodgepole pine, which are the predominating species in these forests, occur in stands, fairly free from underbrush and through which travel is comparatively easy. In striking contrast is the area west of the divide. Here the timber occurs in dense stands of white pine, cedar, larch, fir and hemlock, which carry a large amount of underbrush, so thick as some times to be impassible. This timber is not confined entirely to the north slopes and with the exception of a very few widely scattered mountain meadows there are no open areas.

To make the contrast more striking the maximum stand of timber to the acre east of the divide will not exceed 12,000 feet, while the west slope runs as high as 100,000 feet to the acre and in some cases 125,000. The height of the timber also differs. Eastern slope timber runs 60 and 75 feet high while western slope trees average 100 and 125 feet. It is estimated that there is in the forests of district No. 1 approximately 90,000,000,000 feet of saw timber of which practically 80 per cent lies west of the Rocky mountains. These two slopes of the district include approximately 29,000,000 acres located in 28 national forests. The 12 forests which lie west of the divide contain approximately 15,000,000 and the 16 forests on the east slope about 14,000,000 acres. These figures further present a contrast by reason of the fact that although the areas are about equal, east and west of the divide that the area west holds 75 per cent of the timber.

Type of Country a Factor.

Accessibility is one of the prime factors in limiting fire control, the main thing being to get to the fires when they are small. This can only be done where it is possible to travel over the country with ordinary speed. In the open type of country it is possible to travel with horses by taking advantage of the open parks and bald ridges. It is possible, too, to travel in a great many instances through the timber itself since it is easy to find areas of little windfall and with small amount of underbrush. Fires occurring in such territory can be easily seen and gotten to with little delay, which means they can be caught when so small that they can be trenched or completely extinguished by the patrolman without it being necessary for him to call for outside assistance. However, if outside assistance is needed the character of the country makes rapid travel possible for crews and equipment and the fire can be fought before it reaches any considerable size or does a great amount of damage. This is not theory but actual facts as shown by the recent bad fire season. Many fires occurred on the forests of the eastern slope of the Rockies but practically did no damage. It is true that the open character of the timber had a great deal to do with this but the main point to be emphasized is that the fires could be reached shortly after they were discovered. In the eastern district the weather conditions were as dry and as favorable to forest ignition as on the west slope but the fact that a larger territory could be covered by one man and the fires more easily seen and gotten to, made it possible to prevent the spread of the numerous small fires into a great conflagration such as occurred in the western district.



Death and Destruction.

As accessibility was the main factor in controlling the fires east of the divide inaccessibility was the main cause of the spread of the small fires throughout the forests of the western slopes and of their assuming proportions which made conditions ripe, under a high wind, for the great general conflagration and terrible loss of life and property. The result of that high wind is now too vivid in the minds of people not only living in the immediate vicinity of the forests but of the whole country to make the results appear as the exaggerations of an alarmist. Instead of it being an exaggeration, only part has been told and in fact only part is known and will only be known until the men now in the field have been allowed time to more thoroughly examine the extent and damage of the burned territory. It is known, however, that as a result of the general conflagration 80 men within the national forests lost their lives and whole watersheds of timber were so swept by the flames that not a living green thing is left. That where once stood white pine and its associated species, running from 20,000 to 75,000 feet to the acre, worth from $3 to $5 per 1,000 feet, board measure, on the stump, there now stands a ghastly array of charred stumps and snags around whose roots are beds of ashes, in some cases several feet deep.

On two small watersheds, that of Rainy creek, a tributary of the St. Regis river, and Big creek, tributary to the St. Joe, comprising an area not exceeding 15,000 acres, there was a total loss of a possible $600,000 in stumpage and sales actually contracted and a loss to the community of $10 in wages for each 1,000 feet of the timber burned or not brought to market. This at a conservative estimate would mean a community loss of $800,000. This is not estimated but actual figures derived from the competitive bids for the sale of this timber, contracts having been executed just before the fire for practically all of the timber of this particular district at $4.00 and $4.50 per thousand.

On the great interior areas of the Clearwater national forest where large bodies of timber lie remote from railways and wagon roads and are only accessible by trails, areas variously estimated from three to five townships have been swept by the flames. In like manner the great bodies of magnificent timber on the headwaters of the St. Joe river, estimated at 2,000,000,000 feet; at the head of the St. Regis river, estimated at 1,000,000,000 feet and the areas along the Clark's Fork, Kootenai, Pend d'Oreille and Coeur d'Alene rivers, the estimates of which are not available until a further examination, were devastated.

Homes Destroyed.

Not only was there timber loss on these areas but the homes of many settlers were wiped completely out of existence. Barns, houses and fencing, representing many years of patient toil and hardship, now only blackened ruins, affecting a class of people least able to bear the burden represent another phase of the damage of the great conflagration. In the nature of improvements there were also destroyed on the forests numerous ranger stations. Bridges, trestles, station houses and damaged track aggregating $1,000,000 damage was the estimate made after the fire by the Chicago, Milwaukee & Puget Sound Railway company. The Northern Pacific lost nearly as much property on its Coeur d'Alene branch between Missoula and Wallace and traffic on both of these lines was badly delayed for a month with only a makeshift service in operation. The damaged sections of both of these railways lay within the Lolo and Coeur d'Alene national forests and have not yet been entirely repaired. Telegraph and telephone lines suffered a correspondingly heavy damage, the Bell company alone lost 800 poles and all of the wire over the space they covered.

Besides all of these known losses and the big unknown quantity yet to be estimated and listed there is a fire fighting bill of $610,000—all for the work done in district No. 1.

The First Problem.

With all these facts before us, with the thousands of acres of valuable timber land laid waste, impossible to reproduce by any method known to science for a cycle of another 100 years, the question of forest conservation by the application of scientific methods of marking, planting and utilization seems wholly useless without there first being worked out a practical and effective system of fire protection. With the experience of this season vivid in our minds it appears that to prevent and protect against forest fires is the keystone to the whole structure of forest conservation.

This unquestionably is the first problem in the forest conservation book. It must be worked out and applied before the first lesson can be considered learned. Through it the rest is made worth while and the applications of the later lessons become productive of results. The problem is simple but to make practicable over so large an area will require time, unceasing effort and heavy initial insurance—to prevent loss rather than repay loss. It is analogous to the making of a city safe by an effective fire department.

How foolish it is to plan today for even the present forest or its reproduction without first being reasonably sure that the foundation upon which all this is built is firmly and strongly established—that the forests will be with us tomorrow; that all the work planned and perhaps partly executed will not be wiped out in a twinkling of an eye. Any other line of action would be like putting the cart before the horse of building a house from the top downward.

With the good work of the forest service along this line as far as it has been conducted as a guide and, again, with the lesson of this season's terrible fire immediately before us, the right line of action seems to be clearly indicated. But one practical plan of fire protection seems to be presented. This must include: First, accessibility; second, rapid communication; third, adequate patrol; fourth, equipment.

Accessibility.

Accessibility means a system of ridge and stream trails which tap each district; it means being able to travel through the forest at a reasonably rapid rate; it means making possible the transportation of men and equipment at the time they are needed and can be used with telling effect; it means taking advantage of the element of time—the most important factors in fire control; it means, practically, everything which has been denied the fire fighters this season in the more remote territory of those forests as yet undeveloped.

The plans being advanced for the development of the national forests by the forest servcie are admirable. They will serve all purposes of forest management when completed but the trouble with the present condition is that these plans are too slow in being worked out. These plans are being developed year by year as funds will allow, everything being completely worked out from the start. They are excellent but not adequate under conditions as they exist. What is first necessary is the immediate preservation of the forests from fire. Develop the forest, most surely, but base such development on a fire protective plan. Costly it may be, at least for the initial outlay, but already proven a good business proposition in the long run.

A Developed Forest.

What is a developed forest on a fire protective basis? Accessibility is one of its main features. Such a forest will have trunk trails constructed up main streams and divides; laterals up tributary streams and spurs of the mountains. For a forest unit of a million acres, which would be an area of a tract 50 to 60 miles long and 40 to 50 miles wide, between 400 and 500 miles of trails are necessary before a reasonably heavy timbered area can be considered accessible on a fire protection basis. Through heavy timbered regions the construction of these trails will average $75 per mile, although where some rock work is necessary it has reached a cost of $2,000 per mile in short stretches. The trail should nowhere have a grade to exceed 20 per cent. In making such trails the ordinary crew, a number of men who could work together to the best advantage, will build about a mile a day, clearing out a right of way eight feet wide and grading a tread from 18 inches to two feet wide on the side hills. This work can all be done by temporary laborers under the supervision of the rangers. The work should first all be laid out by the different supervisors so that the trails will connect one district or forest with another as closely as possible. In addition all trails and improvements for fire protection should be carefully platted on maps and kept up to date in case a change in forest men should be required at a time when quick access to the country is necessary.

Besides the regular trails there should be a system of connecting passages through the timber usually termed "shotgun" trails" in which only enough of the heaviest brush is cut to make a short trip through the timber possible. This sort of trail can be constructed for $25 to $40 per mile. Some forests also contain large bodies of water and here boats should be utilized as a means of accessibility. Government launches should be maintained at regular stations and trails should radiate from the various landings.

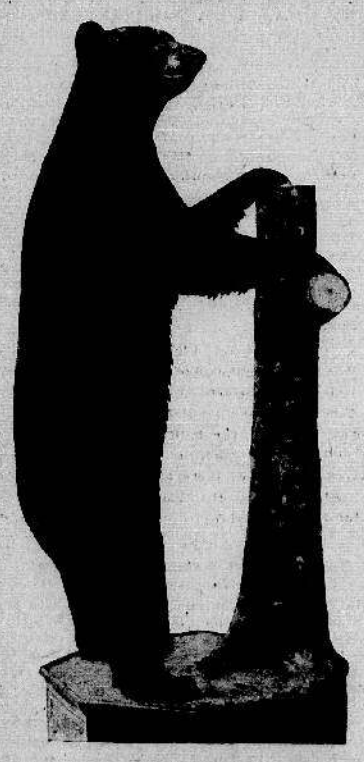
To maintain this network of trails would require some work every year. In the spring they should all be overlooked, the trees which may have fallen across cut out of the way and the trail put in shape for summer's use. This work could all be done by the present permanent force maintained.

Expenses Repaid.

This work if all done at once would be very expensive but when compared with the damage that it would prevent, such expenditure should be willingly made. The fire bill in district No. 1 for 1909 was $30,000. The fire bill for the same district so far in 1910 has been fully $750,000 for the government and caused several millions loss to cities, towns and companies within

(Continued on Page Eight.)

WAR EAGLE TUNNEL, WHERE FIVE MEN LOST THEIR LIVES. TUNNEL IS 60 FEET LONG AND IN IT 40 MEN TOOK REFUGE.



M. L. GULDEN

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