

DEPARTMENT OF THE INTERIOR, CANADA

Hon. FRANK OLIVER, Minister; W. W. CORY, Deputy Minister

FORESTRY BRANCH—BULLETIN No. 7.

R. H. CAMPBELL, Superintendent of Forestry

With illustrations
by R. H. Campbell

FOREST FIRES IN CANADA DURING 1908

BY

H. R. MACMILLAN, B.S.A., M.F.,

Asst. Inspector of Forest Reserves.

OTTAWA

GOVERNMENT PRINTING BUREAU

1909

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PREFATORY NOTE.

In this bulletin an attempt has been made to record the forest fires which occurred during the season of 1908, and the loss resulting therefrom. It is far from complete, especially in regard to the province of Ontario. Incomplete as it is, however, it gives an idea of the damage done by these forest fires in the one season throughout the Dominion of Canada, and it is hoped that it will do its share to attract public attention to the seriousness of the situation.

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FOREST FIRES IN CANADA DURING 1908.

The scarcity of valuable timber in Canada is due more to its destruction by forest fires than to any other cause. It is true that large areas of hardwoods and pine have been cleared for settlement in the Eastern Provinces and that logging has stripped the timber from thousands of square miles, but the territory from which the forest has been removed by these productive industries cannot in area or value be compared with the aggregate of burned-over timberland which is the result of the forest fires of the last twenty years, and which appears as dismal, barren stretches, hundreds and thousands of square miles in extent, along all the railways and all the main water-courses from the Atlantic to the Pacific.

Fires of 1908.

The Forestry Branch has endeavoured to keep a record of the damage resulting from forest fires in 1908, and in this work has been signally assisted by the chief fire rangers on Dominion lands in the West and the officers in charge of the forest fire protective systems of the various provinces. In order to draw attention to the destruction yearly due to forest fires a short description is given below of the worst fires which occurred in 1908.

DOMINION LANDS.

Fire rangers employed upon Dominion lands reported 251 forest fires during the summer of 1908, and there were doubtless many more unreported; but fortunately very few reached serious proportions.

SASKATCHEWAN.

Fires reported from the Prince Albert agency in the province of Saskatchewan burned about 1,800 acres of young timber and destroyed improvements to the value of \$27,200. There were throughout the timbered regions numerous small fires, unreported, which burned over and destroyed the young tree growth. There were not reported from Saskatchewan any fires which affected merchantable timber.

ALBERTA.

Though the construction of the Grand Trunk Pacific between Edmonton and the Yellowhead Pass largely increased the danger from forest fires in Alberta, there were during the whole summer few destructive fires in that province. That such is the case was due to the wet weather during the fire season and to the supervision kept over the construction work on the Grand Trunk Pacific, and the patrol maintained along the railroads and other sources of fire danger on the east slope of the Rocky mountains.

The only serious fire reported from the province of Alberta was one which covered ten square miles in the Spray River Valley, and destroyed 4,000,000 feet of timber, a portion of which can be sawed if logged within a year or two. The ranger who investigated this fire reported that over the whole area all the young growth was destroyed. The fire is believed to have been caused by tourists.

That so few fires were reported from Manitoba, Saskatchewan and Alberta last summer is no indication that the northern timber belt of these provinces entirely escaped visitation from forest fires, as might be surmised from the reports, nor is it any guarantee that in the future they will be in any degree immune from destruction by

fire. The best efforts of the Forestry Branch have not been able so to cover the northern timber with fire rangers that all fires will be prevented, extinguished or even reported. The immense areas of brûlés, through which travellers may pass for a week without seeing a green tree, all bear witness to the fact that fires have always raged unchecked through the spruce and poplar timber of Canada's northland. That the timber limits of Manitoba, Saskatchewan and Alberta are comparatively small and scattered is due, not to any condition of soil or climate which prevents the growth of timber, but to recurring forest fires, which have destroyed the valuable spruce forests and encouraged the extension and reproduction of the less valuable poplar, or, in the more serious cases, destroyed all forest growth.

Forest fires have been serious when there were neither railroads nor settlers in the timber areas, when the only causes of fire were travellers, fur-traders, surveyors, prospectors and Indians. The last few years have seen the beginning, and the next few years will see the climax, of settlement and railroad construction in the timber north of the North Saskatchewan and west of the Calgary and Edmonton railway. Where there are settlers and railroads in a timber country there are fires; and where there has been one fire in the timber in the past, there will be, unless extreme care and vigilance are exercised, one hundred fires in the future. The timber of the middle west, even where it is only small spruce, poplar and scrub pine, is of increasing value to the settlers, and its protection will every year require the employment of an increasing number of active fire rangers.

BRITISH COLUMBIA (CANADIAN PACIFIC RAILWAY BELT).

The most serious fires on Dominion lands in 1908 were in the region of the driest weather, the greatest railway danger and the most valuable timber—the Railway Belt of British Columbia. The fire season lasted here from early in May until October, and during that time a large force of rangers was constantly employed. In spite of their efforts upwards of 100 fires occurred, small and large, and there were injured over 10,270,000 feet of merchantable timber, 200,000 feet which are a total loss, and the remainder of which can be sawed only if logged immediately. In addition to this, forest fires over-ran large areas of cut-over and other lands, and killed outright the vigorous young growth which had been established.

The worst two fires of the Railway Belt occurred in the neighbourhood of Shuswap lake on limits licensed to the Columbia River Lumber Company and the Arrow Lake Lumber Company.

Both fires required the unremitting efforts of a large number of men for several days to subject them, and, before they were controlled, killed almost 10,000,000 feet of merchantable timber. A serious feature of these fires was that while the rangers and their assistants were putting forth every effort to overcome them, squatters and others interested in clearing the land were setting new fires in different places, as if with the intention of burning up the whole country.

The government, lumber and other business and industrial interests lose heavily by every fire which occurs in the Railway Belt. The large number of trains running over the main line of the Canadian Pacific railway through the territory, the constant development of mining, lumbering and railroad construction work, and the increasing number of settlers in the timber on the valley land—all these render the danger of forest fire every year more acute. When forest fires start in the mountain country they sweep up the slopes with irresistible speed and force, and rapidly gather such strength and volume as to render their extinction an impossibility. They must be prevented rather than extinguished, and this requires that, if the immense resources of the Railway Belt are to be saved, the people must be educated to the damage resulting from forest fires, all possible causes of forest fires must be eliminated and there must be employed a large enough force of rangers to patrol efficiently the territory in danger.

The Forestry Branch is yearly endeavouring to meet these obligations; and, as the timber has steadily risen in value and an increase of development in traffic and

exploitation has increased the fire danger, there has been a proportionate growth in the protective system, as illustrated by the following table which gives the sums spent annually per square mile in guarding the timber limits of the Railway Belt. Half the expense has always been borne by the limit holders:—

	1904	1905	1906	1907	1908
East of Yale.	\$5 13	\$6 33	\$6 14	\$5 60	\$ 5 36
West of Yale.	3 48	3 38	6 01	6 27	17 66

BRITISH COLUMBIA.

The province of British Columbia suffered heavily from forest fires during the past season. Reports are available only for the Fernie, Coast and Vancouver Island districts, yet there were reported 235 fires. The total loss was 22 lives, 40,000,000 feet of timber and \$2,350,000 worth of improvements. The greatest loss was in the widely-known Fernie fire and in a fire which raged for some time in August around Cowichan lake on Vancouver island.

The Fernie fire is a good illustration of what is, throughout the newer districts of Canada, a common condition. The Fernie fire was, for a month before the town was consumed, burning in the logged-over lands and waste lands of the Elk River Valley surrounding the town. Because it was not destroying timber *at that time merchantable* no one made the slightest effort to control the fire. Though for over four weeks it spread through the timberland, destroying all small growth, it was allowed to continue unchecked, and the result was that it got into the slashing near the town, a wind sprang up, and, borne upon it, the fire consumed the town and almost everything within its limits, bringing to 22 persons a horrible death, and entailing on a large number the tremendous property loss of \$2,000,000.

The Cowichan lake fire on Vancouver island was one of the many which are yearly destroying the forests of Vancouver island. This fire, presumably started by settlers, destroyed almost 24,000,000 feet of first-class timber, nearly all of which will be a total loss. Professor John Macoun, of the Geological Survey, who spent a portion of the summer on Vancouver island, states that the past season was the worst for fires in the local history, and that so long as a fire is confined to timber, no matter how valuable the timber may be, no popular interest is manifested in saving it. Such may be the view of the squatters; but there can be no doubt that the limit holders must differ, and that they will, in co-operation with the government, extend the present fire patrol so as more thoroughly to cover the country. It might be worth while to point out that on timber sales recently made upon the Olympic National Forest on Puget sound the Forest Service required lumbermen and jobbers to use only oil in their donkey and logging engines. It has been demonstrated that it is cheaper to use oil than first-class fir timber for fuel, and the use, of course, reduces a great source of forest fires.

ONTARIO.

The Department of Crown Lands for Ontario reports that, though during the past year large areas of timberland were burned over, no merchantable timber was destroyed and no damage was done. Ontario has a great area of timberland, the protection of which is complicated by the presence of large numbers of prospectors and tourists and the existence of many miles of railway under construction and in operation within its borders. That it, in common with the rest of the Laurentian country, is marked by very large areas of coniferous brûlé has been an unavoidable misfortune, but that, as is reported, the fires have done no damage is a piece of good fortune worthy of congratulation. The report that no damage has been done must refer to the fact that no bodies of merchantable timber were reported to have been destroyed. The fires which filled the towns of northern Ontario with smoke and endangered navigation on the Great Lakes necessarily covered large territories. It is a fact readily proven by a glimpse of the country along the Canadian Pacific railway through northern Ontario

that fire, where it runs over Laurentian country, especially where it is in the slash of an old logging operation, or in an old brûlé, destroys all vegetation and young forest growth, consumes the soil and leaves exposed a bare sterile rock. The forest fires may occasion a great loss by the destruction of the mature timber, but succeeding fires do a still greater injury to the resources of the province by at once destroying any young trees which nature may have supplied to start a second forest, and by burning off the soil, killing seed-trees and rendering it impossible for forest growth to cover again the land for hundreds or thousands of years.

According to the report of the Minister of Lands, Forests and Mines for 1908, fire rangers were employed as follows:—On licensed territory, 376, at a cost to the province of \$46,621.45; along railways, 147, at a cost of \$53,235.71; on forest reserves, 111, at a cost of \$45,805.18; on Crown lands not under license, 58, at a cost of \$17,398.50. The total number of men employed was thus 692, and the cost to the provincial government \$163,060.84. The licensees paid, as their share of the cost of protection of their limits, \$46,621.45. The total cost of protection of the forests from fire in the province for the year was thus \$209,682.29.

QUEBEC.

The history of Quebec has resembled that of Ontario. During the past twenty-five years widespread fires have swept the timber from many of the great river valleys and from large areas in the north of the province. The forester for the Laurentide Paper Company reports that the operation of the Quebec and Lake St. John railway from Quebec to Roberval was followed by the destruction of all the timber on a strip from five to twenty miles wide along the whole length of the right-of-way, and that recurring fires have annually destroyed the young timber which springs up on the cut-over land.

Railways in other parts of the province have been responsible for turning timber lands into blank wastes. The problem of forest protection is growing more acute each year as the construction of railways into the north increases, and as settlement of the bush country grows more rapidly.

Conditions during 1908 were in Quebec, as in Ontario, exceptionally favourable to the development of forest fires. The annual report of the Crown Lands Department states that: 'The excessive drought, especially in June and during the autumn months until November, left not a moment's respite to the army of fire rangers acting under the joint control of the department and of the license holders. Constantly surrounded by thick smoke that prevented anything being seen beyond a short distance, and that seemed to come from all parts of the horizon, it was almost impossible to form an accurate idea of the situation of the places most in danger.'

The report quoted above states that the fires mentioned were nearly all confined to private lands, there being 171 fires on Crown lands which destroyed 29,325 acres of timber. The worst fire of the season was that of July 11, in which 55 houses, a saw mill, a storehouse of provisions, 38 freight cars, 2,000 cords of pulpwood, about 6,000 railway ties and some firewood, besides timber lands, were destroyed at Daveluyville. At the same time fires occurred at Carmel and Notre Dame du Bon Conseil, which brought the total loss up to \$250,000.

With the dry season of September the number of fires increased, until the whole of northern Quebec was shrouded in smoke and dozens of municipalities were threatened with destruction. The worst fire of the month was that which, on the 29th of September, swept from Lake Megantic to the twin villages of Megantic and St. Agnes, destroyed seventeen buildings and resulted in a property loss of about \$200,000.

The Superintendent of Forest Protection for Quebec reports that, in spite of the damage done by forest fires, there is great carelessness on the part of many settlers fighting fires and allowing them to get entirely out of control, and that the greatest indifference is shown to the disastrous consequences which they cause.

NEW BRUNSWICK.

The province of New Brunswick escaped serious damage by fire during 1908. The Deputy Surveyor General reports that about 10,000 acres were burned over, the fires being confined to old burned lands. The freedom from loss is credited to the force of 100 fire, fish and game wardens and 100 fishery wardens, employed by the governments, whose duty it is to protect the timber lands from fire.

NOVA SCOTIA.

The report furnished by the Commissioner of Crown Lands for Nova Scotia shows that 56 forest fires occurred in that province during 1908. One, a fire covering about 200 acres in Halifax county, destroyed timber valued at \$975. The remaining fires, covering about 630 acres, were confined to poor and barren lands—lands which had probably been made poor and barren by previous fires.

SUMMARY.

The table given here shows relatively the destruction due to forest fires in 1908.

Jurisdiction.	Number of Fires.	Area Burned Over.	Feet of Timber Damaged or Destroyed.	Value of Timber and Improvements Destroyed.	Lives Lost.	Men employed.	Private Expense.	Public Expense.
		acres.		\$ cts.			\$ cts.	\$ cts.
Dominion Government—								
British Columbia	100	?	10,270,000	5,135 00		464		21,757 48
Alberta	57	7,540	4,000,000	3,180 00		46		13,086 60
Saskatchewan	84	1,800		21,200 00		77		10,319 95
Manitoba	28	120	20,000	60 00		14	500 00	4,701 14
British Columbia	235	88,100	40,000,000	25,000,000 00	22	118	5,000 00	28,083 21
Ontario						692	46,621 45	163,060 84
Quebec	250	80,000		500 00		493	12,090 00	12,000 00
New Brunswick	25	10,000	2,000,000	3,000 00		500	25,000 00	25,000 00
Nova Scotia	56	830		975 00				6,089 00
Totals	835	188,300	50,290,000	25,533,550 00	22	2,404	80,121 45	284,098 28

Nova Scotia employed 1,500 days' labour in fire fighting.

Destruction of Forests by Fire

EXTENT AND IMPORTANCE.

Although the totals appear large, they are all incomplete. The forested territory of Canada is so extensive that record can be secured of only a small percentage of the fires which occur annually. Few or no fires are ever reported for the Northern Forest region, yet in this region we find the most extensive brûlés on the continent, burned-over areas covering hundreds of square miles.

The destruction due to forest fires is under estimated, even for the fires reported. Unless a fire destroys personal property or merchantable timber it is reported as harmless. No account is taken of young growing trees or of the fertility of the soil.

The young trees now covering large areas of cut-over and burned-over land are the trees which are the only timber supply of the future. It is a supply which must be provided. Over large areas on Canadian public lands nature is providing this supply free of cost to the country. In Europe and in several States of the American Union such young trees are being planted for a future timber supply at a cost of \$6 to \$10 per acre, or \$3,840 to \$6,400 per square mile. It is, therefore, just as short-sighted to

consider that when a crop of young trees is destroyed by fire no damage is done as it would be to report that no loss was sustained by the destruction of a field of green grain or any other immature crop.

REFORESTATION.

Replanting burned-over areas, even though it pays finally and yields a fair return in the investment, is the most expensive operation in forestry. If the timber is protected from fire, natural reproduction is so abundant that there will never be very much planting to do.

DESTRUCTION OF SOIL BY FIRE.

One of the most serious results of forest fires is the destruction of the soil. Repeated fires, especially on rocky or sandy land, or in mountain country, destroy first the mature timber, then any young trees which may follow and finally, having burned off the vegetation and the humus, leave sterile subsoil or rock exposed. Where a subsoil exists, it is, particularly in a rough country of steep slopes, exposed to the weather, and with every rain is washed down to fill stream beds, impede navigation and damage irrigation works. When there is no subsoil and the bed-rock is uncovered, a barren waste is produced upon which no crop of profit can be grown until the lapse of hundreds or thousands of years unless fire results in the production of a thin soil cover.

The soil is the capital of a district relying on lumber or agriculture. Every fire which passes over the soil reduces the capital; and in our northern forest belt it requires but few fires to utterly destroy the capital.

CAUSES OF FOREST FIRES.

Reports from all the provinces are unanimous in giving, as the main causes of forest fires, sparks from railway locomotives, bush burning by settlers and carelessness by travellers and sportsmen. Fires from other causes are, to a great extent, preventable. The first necessity is the education of the people to the extent of the damage due to forest fires, the second a more thorough patrol of the country where fires are likely to occur, and the third a more stringent regulation of the railways. New York State has recently passed a law requiring locomotives on all railways operating through the state forest lands to burn oil from 8 a.m. to 8 p.m. during the summer months.

SUCCESSFUL FIRE PROTECTION.

That forest fires are unnecessary and can be successfully controlled is shown by the experience of several countries where an efficient fire protective organization has been developed.

The National Forests of the United States comprise over 190,000,000 acres of land, the greater part of which is within rough mountain ranges and inaccessible districts difficult to patrol. Yet by its system of protection the Forest Service has annually reduced the burned-over area in the National Forests, as is shown in the following statement:—

Year.	Percentage of forests burned over.
1904.66 of 1%
1905.16 of 1%
1906.12 of 1%
1907.07 of 1%

This is convincing proof of what can be done by an organized protective force which has the support of the people.

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