FIRE PROTECTION IN NORTHERN SASKATCHEWAN

By E. H. ROBERTS

Within the province of Saskatchewan, that lies between latitudes fifty-four and fifty-six, is to be found an area of approximately twenty-five million acres. This district which is very sparsely inhabited contains a veritable network of lakes and rivers and a forest cover of spruce, poplar, jack pine and birch.

This area divides itself into portions of two great geological regions; a northern, pre-Cambrian, chiefly rocky region, a portion of the Laurentian shield and composed of granite and gneiss rock formations, and a southern post-Cambrian region without rock outcrops except the limestones in the eastern part.

The soil of this wooded area has most likely been transported and laid down by water and ice during the glacial period. A great diversity of soils is to be found, from pure sand and gravel to clay. The northern region is largely composed of glacial drift of sand and gravel with deposits of clay and alluvial loam along lake shores and streams. Much of the southern portion is rolling sand hills, boulder clay ridges and undrained muskeg.

The rivers and lakes in this district may be looked upon as great reservoirs capable of sustaining immense water powers on the Churchill River which flows from west to east across the northern part of the region. These same lakes contain quantities of fish which at the present time support a valuable industry during the winter months. The region has, since its early exploration, produced much fine fur and big game animals.

The mineral area which overlaps the forest lands on the north has disclosed some rich ore bodies which at the present time are in course of development by mining interests. Railways are seeking charters to extend their lines into this potential field.

The forest contains valuable areas of spruce and jack pine saw timber, pulpwood, ties and fuelwood. Much of this timber is inaccessible at the present time but, with increased development and the extension of transportation systems, will become of increased value. The valuable tree species consist of white and black spruce, jack pine, balsam, birch, poplar and larch. Roughly calculated, the area may be divided into forty percent water and muskeg, forty percent timbered, and twenty percent burn. Much of the burned area is restocking.

Insect damage to the forest has not been extensive. The larch sawfly has been the worst offender, killing most of the larch of saw timber size. The forest tent caterpillar has attacked in a few scattered local areas. The bark beetle is prevalent but has not reached an epidemic stage in any part. The spruce bud worm, boll weevils, and other pests that are causing so

much damage in other parts of the continent have not as yet been observed in the district.

Fire protection is the main activity of the Dominion Forest Service in this area. With the co-operation of the Royal Canadian Air Force and the Royal Canadian Corps of Signals, a fire detection and suppression organization has been installed that is most adaptable to the country. The last decade has seen almost revolutionary methods of detection and suppression put into practice with the aid of aircraft and wireless.

By arrangement and co-operation with the Royal Canadian Air Force, who supplied the required aircraft and personnel to fly and maintain them, the Forest Service has been ably assisted in increasing the efficiency of its fire protection organization in this district. The Air Force is also thus enabled to keep its personnel well trained and at the same time employed in some useful work.

The use of aircraft and wireless in forest protection work has been a remarkable achievement in the past few years. The old methods of tedious canoe patrols along winding rivers and across rough, windy lakes has been abandoned, while the present air patrol covers the same country much more effectively. The ground organization, formerly a moving patrol, has now become largely stationary. The territory in the patrol districts has been so subdivided that each locality has a base or sub-base from which all operations within that district are carried out. Flying boats or seaplanes have been used most effectively to carry out detection and supervision patrols and for suppression work. Daily detection patrols are carried out when the fire hazard conditions warrant and in localities where required. The Aircraft have their main base in the south central part of the territory with a sub-base in the north central part. Six refuelling stations are located at strategic points where fire rangers have headquarters and suppression crews and supplies are available.

Winter campfires set by trappers and freighters and left unextinguished often burn deep into the moss or smoulder all winter under the shelter of heavy spruce foliage to break out during the dry, windy, spring fire season and cause much damage. Detection of these fires in the late winter, before they have spread to any extent or done any damage, is of great assistance to the local fire ranger at the beginning of the season. For these detection patrols, small light planes of the D. H. Moth type are used equipped with skis for landing on the ice. The landing gear is replaced by floats as the ice breaks up in the lakes and open water is encountered.

In the spring when the break-up comes and the waterways open up, seaplanes are put into operation. A small flying boat called a Vedette, which will carry four to six hundred pounds, is used for detection patrols and light suppression work in addition to the Moth planes. Larger flying boats, Varuna or Fairchild, with twin motors and a carrying capacity of

approximately fifteen hundred pounds, are used for heavy suppression work. These planes are kept standing to at the base, fully equipped and in readiness to take the air on short notice when required.

Rapid communication, essential to all effective fire protection work, is secured by the co-operation of the Royal Canadian Corps of Signals. Wireless sending and receiving stations of 100 watt capacity operating on a wave length of about 1100 meters have been installed at five different points in the district. The control station is located at the headquarters of the forest officer in charge of the territory. Other stations are located at the main air base and at sub-bases in various parts of the district. Regular communication is maintained between stations for reporting weather and fire conditions and for the sending and receiving of instructions and reports.

Detection aircraft equipped with wireless sending sets keep in touch with the bases and promptly report all fires observed, with details of same. Immediately these fire reports are received by the District Fire Ranger he takes action to despatch a suppression plane with men and equipment to the nearest point on a waterway from which a crew can operate. Suppression planes return at once to their base to be in readiness for further action. All fire rangers and fire fighting crews are provided with two canvas panels, twenty feet long by three feet wide, which are used for ground signals. By this means they can communicate with the pilot of a plane in the air. More men or supplies can be called for or the patrol planes advised as to when the fire crew are ready to be moved or return to the base. Fire rangers or crew foremen are taken for flights over the fire area from which they can get first-hand information as to the extent and progress of a fire and then plan effective control action. Fire maps may be sketched from the air and aerial photographs taken of burns, which are of great assistance in preparing estimates of damage.

At the main air base, each sub-base, and refuelling point, usually located at some settlement, there is maintained a warehouse fully stocked with fire fighting tools and equipment. Portable fire pumps, hose, axes, shovels, mess kits, tents, night lights, etc., are kept in a neat and orderly manner and ready assembled for immediate transport. At the fire rangers' headquarters are kept large freight canoes, equipped with outboard motors, which can also be used in transporting men and crews to fires that occur in close proximity to the station, in case the planes are not immediately available.

With all the various and kindred fire fighting equipment now in use, there still remains much to be done along the line of perfecting tools for this use. Night lights for fire fighting have been tried out and found effective under certain conditions. Smoke masks and goggles are being experimented with. Various types of brush burning torches are being tried out and an attempt being made to secure an efficient torch at a reasonable price. Vari-

ous weather recording instruments are in use and an attempt is being made to carry on research in this direction to discover the relationship of static to fire weather. Weather forecasting and more accurate predictions of hazardous periods is being attempted in the hope that this will be of some assistance to the field staff. There is no doubt but that with more thought and study put on this fire problem we will in some measure be able to largely improve upon present methods and equipment.