

## FIRE MANAGEMENT

Because most forest land in Canada is under provincial or territorial jurisdiction, fire management is the responsibility of their forestry agencies. The Canadian Interagency Forest Fire Centre, established in Winnipeg in 1982, provides daily information, keeps statistics, and co-ordinates inter-agency exchanges of fire-control forces and equipment. The federal government's Atmospheric Environment Service collects and processes daily weather data and provides fire-danger ratings to the various control agencies. The Canadian Forest Service, in co-operation with several universities, carries out most forest fire research in Canada, including the development of systems for danger-rating and management.

Fire detection in Canada is usually by aerial patrols along planned flight patterns; these have nearly superseded the traditional fire towers. Aerial patrols are backed up by systems of lightning detectors that pinpoint probable locations and expected numbers of lightning fires. Fire-control methods include aerial water-bombing (sometimes with fire-retardant additives) and, on the ground, the use of portable water pumps with hose lines, tank trucks, bulldozers, and hand tools. Burning out from a prepared line to stop an oncoming fire is sometimes feasible. All Canadian forest fire agencies are now well computerized, and utilize a range of programs based on the outputs of lightning-detection and remote-sensing equipment, the FWI and FBP Systems, historical fire-data analyses, and topographical forest-land maps. These programs guide resource deployment, design aerial patrol layout, predict fire occurrence, model fire growth, and back up fire-control strategy generally.

Fire, along with climate and soil, is one of the three primary natural factors that have shaped the present Canadian forest. Much of this forest is, in its natural state, ecologically dependent on recycling by random periodic fire for its long-term stable existence on the landscape. In the boreal forest, for example, the main tree species are black spruce, jack pine, lodgepole pine, trembling aspen, and white birch, all of which are adapted to regenerate even after all individuals over a large area have been killed by fire. Aspen suckers directly from its root systems, while other hardwoods sprout from the base of dead trees. Jack and lodgepole pines and black spruce store live seed in their crowns for years, only shedding them after the cones are opened by heat from a fire.

In pre-European times ignition was mainly by lightning, and, without control, perhaps two to three times as much area burned annually as at present. Ecologically, then, fire is neither good nor bad, but simply an environmental necessity for the perpetuation of the forest in its natural state. As fire-control efforts are increased, it costs more and more to reduce the annual burned area by any given amount. Theoretically, the ideal position would be the point at which the cost of further reduction in burned area just equalled the value of the corresponding increase in timber supply. Other forest uses are also taken into consideration, and the safety of forest towns is a primary concern.

The interaction of ecological and economic factors complicates forest-fire management in general, and debate is continuous about the optimum level of fire-control effort. The Canadian Forestry Association along with the provincial forestry departments carry out fire-prevention programs aimed at educating people about their responsibilities toward the forest. Whatever the complexity of the forest fire picture, the rule "do not start forest fires" remains as valid as ever for the individual citizen.

Canada's forest fire season usually starts as early as April, with grass fires that scorch the landscape. Then the season moves into high gear with the first round of forest fires in May and June, with more to come in the dry summer months.

By the time it's all over in September, an average of 25,000 square kilometres — an area the size of Lake Erie — will have burned in roughly 10,000 fires across the country.

Provincial governments and Parks Canada hire and train hundreds of firefighters who spend the summer doing the annual battle with fire. Others are highly trained firefighters who have gone to school to learn the intricacies of fire behaviour and suppression.

They may spend weeks living in fire camps and spend long, hard hours fighting stubborn blazes that will only get worse because of high winds. They will be transported to other provinces to reinforce firefighters worn down by a blaze that won't be controlled.

Many will be on the ground, using hand tools, chainsaws and water pumps to control fires. But Canadians have also become experts in battling blazes from the air with helicopters, rappelling and parachuting crews, water tankers and even satellite monitoring systems.

Although fire lookout towers, first introduced in the 1920s, are still used in high-risk zones, more sophisticated methods have been introduced. Computerized monitoring systems log all lightning strikes, and the federal government's Canada Centre for Remote Sensing can detect locations of fires across the country using satellites.

Using the Canadian Forest Fire Danger Rating System, fire managers can determine the moisture levels in the forest, how fast the trees will burn, how much of the forest will be consumed and in which direction the blaze will spread. Once a fire has been brought under control, infrared scanners are used to detect remaining heat sources.

Most fires are caused by humans: 52 per cent of the wildfires that consume our forests and grasslands every year are caused by carelessness and could have been prevented. The rest, 48 per cent, are caused by lightning. It can be a natural part of a healthy grassland or forest ecosystem. Fire reduces the buildup of dead and decaying leaves, logs and needles that accumulate on the forest floor. It reduces or eliminates the overhead forest canopy, increasing the sunlight that stimulates new growth from seeds and roots. Many plants and animals have adapted to fire. Both lodgepole pine and jack pine have resin-sealed cones that stay on trees for many years. The heat of fire melts the resin and the cones pop open. Thousands of seeds then scatter to the ground and grow into new stands of pine. Woodpeckers feast on bark beetles and other insects that colonize in newly burned trees.

And so, 20 years ago, Parks Canada decided that it wouldn't interfere in natural processes such as fire, insects and disease unless it had to — that is, unless people or neighbouring lands were threatened. More recently, forest managers across North America have introduced programs of deliberately lit "prescribed fires" to clear out forest debris and restore ecosystems that are dependent on fire to thrive. Trained specialists decide when and where, and for how long, to permit such fires to burn. They consider weather, vegetation type, fire behaviour and terrain to decide whether the fires can burn safely. Although prescribed fires have become common in the United States and Canada, they are also controversial.

In Canada, prescribed burns have been strongly opposed by landowners and outdoors-related businesses. Timber is a valuable resource and it's hard to convince anyone that burning down trees, even on a small scale, makes sense.