

In Ontario, fires are detected by aerial patrols using contracted aircraft, in conjunction with a lightning locator system and by public reports. To assist in fighting fires, water bombers and helicopters are utilized and fire crews employed as required. A communications system includes a network of radios, telex and facsimile. A network of 125 primary weather stations supplies information to determine fire weather indexes and aids in detection patrol planning.

In Manitoba, the major source of loss in forest volume, for which statistics are available, is wild-fire. Fire detection and fire fighting are provided by a network of lookout towers, an aircraft detection system, and ground patrols. Public education in fire prevention is carried out through radio, television, newspapers, pamphlets, signs, films and tours.

Saskatchewan uses a network of lookout towers, an intensive lightning detection system, and aircraft patrols for forest fire detection during the dry season. During periods of extreme fire hazards, additional detection aircraft are utilized. Helicopters and fixed-wing aircraft capable of water-dropping provide aerial support. There are also land-based aircraft which drop long-term fire retardants and skimmer-type water bombers.

Alberta has a fire detection system consisting of 143 lookout towers, supplemented by aircraft patrols. It also operates an automatic lightning detection system and has integrated this system with direction finders in British Columbia and the Northwest Territories. Alberta's fire-fighting force consists of crews equipped with helicopters, land-based airtankers and amphibious airtankers. The airtanker fleet operates from 15 bases, all equipped with long-term fire retardants. Support is available from approximately 5,000 trained firefighters.

British Columbia maintains a network of 24 lightning location detectors covering the entire province. Five of these sites are shared with Alberta and the Yukon. A network of over 350 weather stations is also in the process of being fully automated. This will make weather observations and fire weather indexes available on a continuous basis to wildfire control personnel at 43 districts and six regional offices, as well as several outside agencies, through colour graphics terminals connected to a main host computer. Information on lightning strike location, fire weather, fire behaviour, and fire occurrence prediction, among others, is presented in both text and colour graphics forms. British Columbia's fire detection program also includes lookouts and air patrols. Fire-fighting forces, in addition to the normal

ground crews, also include specialized forces such as crews capable of descending to inaccessible terrain from a hovering helicopter, specially trained mobile teams, helicopters equipped with water tanks (helitankers), airtanker fleets and airtanker bases.

Budworms remain the most damaging forest insect pest in Central and Eastern Canada. While not as severe as in 1980 when 1 380 000 ha (hectares) of the forested area of Nova Scotia were defoliated by spruce budworm, many areas continue to be attacked. In 1985, 345 200 ha were defoliated by the budworm.

Forest spray operations against spruce budworm have been conducted in New Brunswick since 1952, every year except 1959. As in the other regions of eastern North America, infestation by spruce budworm has decreased in the province. In 1983, moderate and severe defoliation was detected over 2.0 million hectares. In 1988, only 0.5 million ha of infestation were detected. Although chemical insecticides have been used perennially, almost exclusively, in control operations, the use of biological insecticide *Bacillus thuringiensis* (B.t.) has increased over the past five years. In 1988, almost half of the 450 000 ha sprayed in New Brunswick were treated with B.t.

In Quebec, the amount of forest land infested by spruce budworm has also decreased significantly since 1981. In 1988, 700 000 ha were infested, compared with almost 13 million hectares at the peak of the infestation. Some spraying programs and research are continuing to combat this problem.

In Newfoundland, the major coniferous defoliator, since 1984, has been the hemlock looper. Aerial spraying to control this insect pest was confined to the northwest portion of the province in 1988. Under a joint provincial/industry arrangement, approximately 77 000 ha of forest land were sprayed. Approximately 75% of the area was sprayed with the chemical fenitronthion; the remaining 25% being sprayed with B.t. In addition to the operational spray program, the province and the industry continued their sponsorship of insecticide experiments, carried out by Forestry Canada. These experiments were designed to look at less toxic alternatives to fenitronthion such as B.t. and Dimilin; a continuation of an experiment commenced in 1985 which is anticipated to yield valuable results in determining the specific "spray window" as well as the minimum dosage required to achieve reasonable control with biological and low toxicity chemicals.

Three insects represent the greatest threat to Ontario's forest resource: the gypsy moth, the