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# SURVEY

# BULLETIN

Forest Insect and Disease Conditions in Ontario

Fall 1983



Winter sampling for spruce budworm,  
*Choristoneura fumiferana* (Clem.)

## FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO

Fall, 1983

This is the final bulletin to be issued by the Forest Insect and Disease Survey (FIDS) in 1983. This bulletin, along with the Spring and Summer issues, describes the more important forest pests in Ontario in 1983. More detailed regional reports are now being prepared and will be issued in the spring of 1984.

### FOREST INSECTS

The Seventh Annual Forest Pest Reviews for Ontario were held this fall, the Southern Ontario Review in the McDonald Block, Queen's Park, Toronto on 2 November and the Northern Ontario Review at the Great Lakes Forest Research Centre (GLFRC) in Sault Ste. Marie on 24 November. There were record turnouts at both meetings: 106 in Toronto and 85 in Sault Ste. Marie.

Among the topics discussed at the Southern Review were Scleroderris canker, gypsy moth, oak leaf shredder, weed control in old fields, and pests of white pine plantations and cones, and there were updates of several pests (spruce budworm, jack pine budworm, cedar leafminers, and blackheaded budworm). The agenda for the Northern Review included new herbicides for the control of competing vegetation, spruce budworm, pests of jack pine, operational use of *B.t.* against the spruce budworm in Ontario, and pests of black spruce plantations and cones. Papers on insect flight and on biorational control agents research at the Forest Pest Management Institute (FPMI), as well as two films, were presented at both reviews.

Staff from the Pest Control Section of the Ontario Ministry of Natural Resources (OMNR), GLFRC, FPMI and the University of Toronto presented the programs. The reviews were attended by staff from OMNR, the Canadian Forestry Service, forest and chemical companies, conservation authorities, Agriculture Canada, the Ontario Ministry of the Environment, universities and colleges (Toronto, Guelph, York, Carleton, Lakehead, Sir Sandford Fleming and Sault College), the Ontario Forestry Association, the Royal Botanical Gardens and the city of Burlington.

### FOREST INSECTS

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

In the Summer Survey Bulletin it was reported that the overall area showing moderate-to-severe defoliation by budworm increased by over a million hectares to a total of 9,039,862 ha in 1983. This increase in 1983 followed a sudden decline in 1982. The bulk of the increase

occurred in northwestern Ontario where 2,181,000 ha are now infested. Small decreases were recorded in northeastern and southern Ontario (Table 1). Subsequent surveys have shown that the area of budworm-associated tree mortality now totals some 12.119 million ha, an increase of about 485,000 ha (Table 2, Fig. 1).

Table 1. Comparison of the area of forest in Ontario defoliated by budworm in 1982 and 1983.

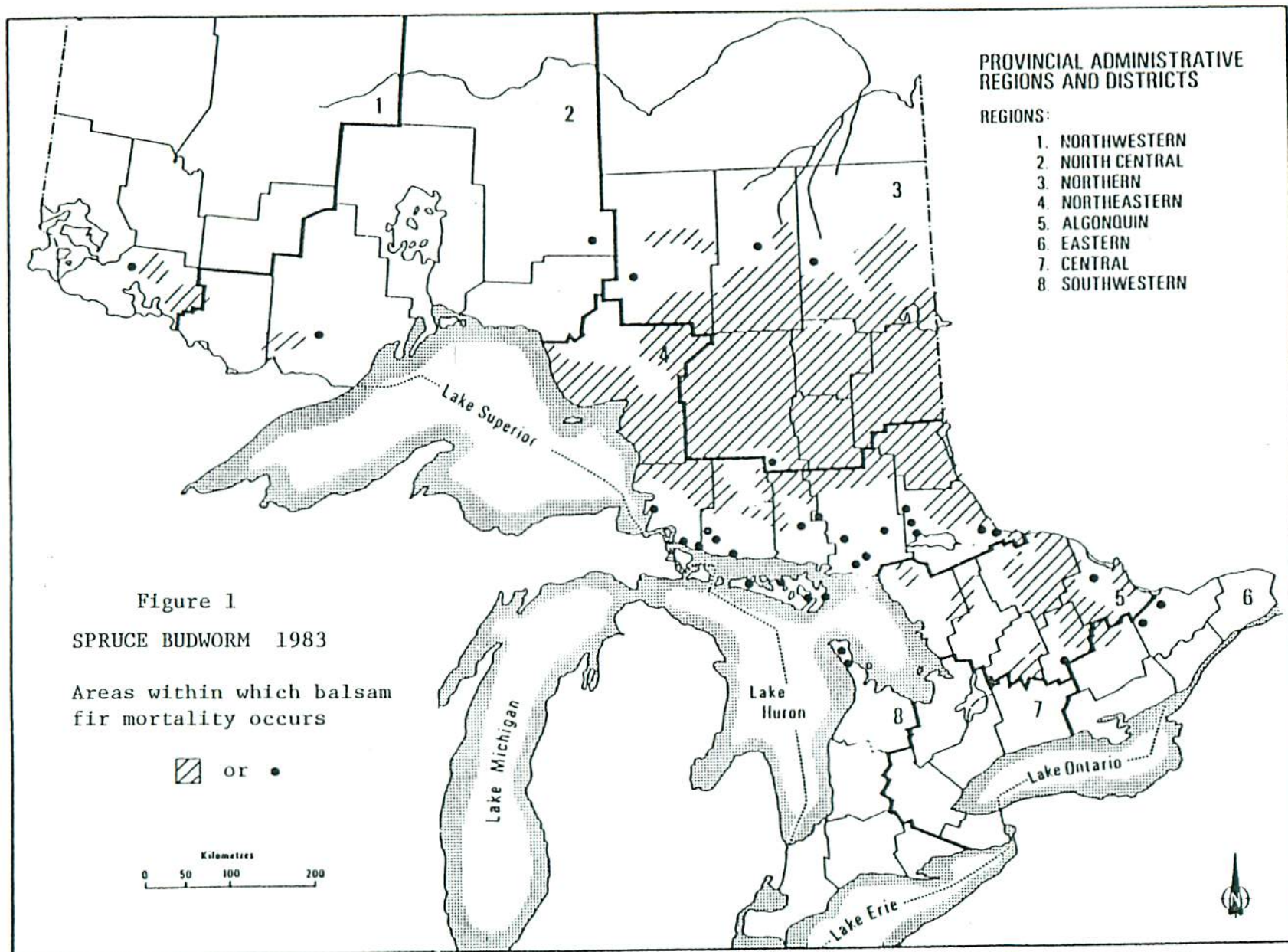
Outbreak region	Gross area of moderate-to-severe defoliation (000,000 ha)		
	1982	1983	Change
Northwestern	.931	2.181	+ 1.250
Northeastern	6.669	6.451	- 0.218
Southern	<u>423</u>	<u>.408</u>	- <u>0.015</u>
Total:	8.023	9.040	+ 1.017

Table 2. Comparison of the area of budworm-associated tree mortality in Ontario in 1982 and 1983.

Outbreak region	Gross area of budworm-associated tree mortality (000,000 ha)		
	1982	1983	Change
Northwestern	0.150	0.191	+ 0.041
Northeastern	9.934	10.355	+ 0.421
Southern	<u>1.550</u>	<u>1.573</u>	+ <u>0.023</u>
Total:	11.634	12.119	+ 0.485

Most of the increase occurred in northeastern Ontario where the area of budworm-associated tree mortality now stands at 10,355,000 ha, an increase of some 421,000 ha. Budworm populations within this area are generally quite low and it is expected that the spread and rate of tree mortality will decline.

On the other hand, budworm populations in northwestern Ontario have been building up for several years. Budworm-associated tree mortality increased by 41,000 ha in 1983 for a total of 191,000 ha, mainly in the Fort Frances and Thunder Bay districts. Increases are expected in both



extent and rate of tree mortality in this part of the province as balsam and spruce stands continue to receive the full impact of accumulated budworm defoliation.

Egg-mass surveys were carried out at some 595 locations in Ontario during the months of July and August. An analysis of the results indicates that overall egg-mass densities have increased by 61%. In northwestern Ontario, higher numbers of egg masses were recorded in all districts, and there was an overall increase of 75%. The area of moderate-to-severe defoliation is expected to increase substantially in 1984, possibly to twice the area defoliated in 1983.

In northeastern Ontario, the results of egg-mass surveys were quite variable with egg-mass densities increasing in six districts and declining in eight districts, for an overall increase of 32%. It is expected that the area of moderate-to-severe defoliation will increase in the western portion of the outbreak (Wawa and Hearst districts) and in the northeastern parts (Temagami and Kirkland Lake districts). Populations and defoliation will decrease in the Sault Ste. Marie, Blind River, Espanola and Sudbury districts and persist at about the same levels in North Bay District. Increased populations based on a 35% increase in egg-mass densities are expected in the Chapleau District which has been free of moderate-to-severe defoliation for the past two years. In southern Ontario, a 17% decline in egg-mass densities should be reflected in a further decrease in the area of moderate-to-severe defoliation. However, numbers remain sufficiently high that medium-to-heavy infestations will probably persist in the Parry Sound and Algonquin Park districts of the Algonquin Region.

Blackheaded Budworm, *Acleris variana* Fern.

Unusually heavy and widespread infestations of this insect which occurred within an area of some 14,600 ha in the Parry Sound and Minden districts of the Algonquin Region were described in the Summer Survey Bulletin. Lighter infestations occurred in a number of other areas. In August an additional area of heavy infestation was discovered in the Sudbury District of the Northeastern Region. Eastern hemlock within an area of approximately 2,200 ha was moderately to severely defoliated in the La Cloche Mountains in Rutherford and Roosevelt townships. Egg counts carried out this fall indicate that the insect will probably be numerous in these areas in 1984.

Maple Leaf Cutter, *Paraclemensia acerifoliella* (Fitch)

Several areas of medium-to-heavy infestation were reported from the Central and Eastern regions. In the Central Region, a 16-ha stand of sugar maple in the Halton Regional Forest suffered defoliation in the

60% range for the fifth consecutive year. Moderate-to-severe defoliation was recorded on understory trees and the lower branches of dominant and codominant trees in a 5-ha stand on Beausoleil Island in the Georgian Bay Islands National Park in Huronia District. In the Eastern Region, the heaviest infestations occurred in the Brockville District. Here, a 6-ha stand in Augusta Township suffered 100% defoliation and an area exceeding 100 ha in the Chaffeys Lakes area of South Crosby Township suffered defoliation in the 60-80% range. Low populations were recorded in a number of areas in the Tweed and Carleton Place districts and in Anstruther Township, Bancroft District in the Algonquin Region.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

This insect occurs throughout the province but in 1983 most reports were received from northern Ontario. The most severe damage occurred in the Kirkland Lake District of the Northern Region where jack pine plantations ranging in size from 5 to 50 ha had leader damage in the 9-15% range. Leader damage was 13 and 12%, respectively, at locations in Barr and Firstbrook townships in the Temagami District, Northeastern Region. Infestations were reported at numerous other locations in northern Ontario but quantitative sampling revealed that in most circumstances leader damage did not exceed 5%.

Introduced Pine Sawfly, *Diprion similis* (Htg.)

Heavy infestations of this defoliator occurred within an area of about 1,200 ha on islands in Lake of the Woods in the southern Kenora District. Within this area, white pine suffered defoliation as high as 80%. In some instances, the little foliage remaining on the trees turned bright red and it is expected that mortality may occur in some of these cases. Elsewhere, small numbers of larvae were observed in several areas in the southern Fort Frances District. Heavy infestations which occurred in Morris Township, Wingham District in 1982 collapsed in 1983.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Generally low and declining populations occurred in northern Ontario in 1983. Exceptions to this general trend were in Geraldton District where a 5-ha stand of tamarack in Errington Township was infested for the third consecutive year and a 2-ha stand near Murky Creek along Highway 584. Defoliation in both cases was about 80%. Moderate-to-severe defoliation was also recorded in a 6-ha stand in McTavish Township and in a 1-ha stand in Neebing Township, Thunder Bay District. Severe defoliation occurred in a 1-ha tamarack stand in Carman Township, Ignace District, while the area of moderate-to-severe

defoliation in an infestation in Morley Township, Fort Frances District declined from 10 ha to 1 ha this year.

In southern Ontario, low populations were also reported from most areas except for a 5-ha European larch plantation at Canadian Forces Base Borden in Huronia District that was moderately defoliated.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Information presented in the Summer Survey Bulletin showed that the total area infested by this insect declined from 103,700 ha to 30,600 ha this year. Only two infestations of any significance remain in the province. These are located near the city of Thunder Bay, Thunder Bay District where 26,500 ha were infested, and northeast of the town of Matheson on the Cochrane-Kirkland Lake District boundary where 4,100 ha were affected. Egg counts made during August and September indicate that the infestation in Thunder Bay District will probably decline in intensity and area affected in 1984. Egg counts in the Matheson area suggest that this infestation will probably persist at similar levels in 1984 with pockets of heavy infestation in about the same area as in 1983.

Green-striped Mapleworm, *Dryocampa rubicunda rubicunda* (Fabr.)

Reports of this insect were received from several areas in the Northeastern Region. The most severe damage occurred in a 450-ha area in Selby Township, Temagami District where defoliation of 40% and 100%, respectively, was recorded on sugar and red maple. Variable populations, generally low, were observed on sugar and red maple trees at several locations in the Blind River District. Medium infestations occurred in Attlee, Humboldt and Carlyle townships, Sudbury District where a total area of approximately 30 ha of roadside and understory red maple was moderately defoliated. Elsewhere, small numbers of larvae were found at two locations in the Fort Frances District, and a heavy flight of adult moths was observed at Bon Echo Provincial Park in Barrie Township, Tweed District.

Fall Webworm, *Hyphantria cunea* Dru.

Increased, high populations were reported from the Eastern, Central and Southwestern regions in southern Ontario for the second consecutive year. The heaviest, most widespread infestations were in the Southwestern Region. Heavy infestations occurred in the Bruce Peninsula area and in MacGregor and Collingwood townships of the Owen Sound District. Black ash was the favored host but most other deciduous trees and shrubbery were also attacked. Heavy infestations also occurred on roadside and ornamental trees at many points in the Chatham, Simcoe and Aylmer

districts, particularly in areas south of Highway 401. The most spectacular infestations occurred in Point Pelee National Park where many black ash and black walnut trees were completely encased in webbing. In the Central Region, the highest populations were in the southern Niagara District and the northern Huronia District. The heaviest infestations were in Baxter, Tay and Orillia townships of the Huronia District where ash was again the most commonly affected host. The most severe damage in the Eastern Region was in Goulbourn Township, Carleton Place District where a black ash swamp of about 40 ha was almost completely encased in webbing. A small pocket of heavy infestation, about 1 ha, was reported from Burleigh Township, Bancroft District in the Algonquin Region. Single tents and small numbers occurred commonly throughout much of the remainder of southern Ontario.

There were no heavy infestations in northern Ontario but small numbers of feeding nests were reported from the Timmins, Temagami, Kirkland Lake, Dryden, Kenora, Fort Frances, Espanola and Thunder Bay districts.

Mountain-ash Sawfly, *Pristiphora geniculata* Htg.

This introduced sawfly has now extended its range to include virtually all of Ontario. Colonies of larvae were found commonly throughout the Northwestern Region, the last part of the province to be invaded by the insect. Populations were generally low in southern Ontario except on ornamentals in a few urban areas.

In northern Ontario, the highest populations were reported north of Lake Superior in the southern Terrace Bay and Wawa districts and the northern Sault Ste. Marie District, where fringe and understory trees were often completely defoliated. Moderate-to-severe defoliation was also reported west and north of the city of Thunder Bay, Thunder Bay District, in Nesbitt Township, Cochrane District, in Studholme and Gill townships, Hearst District and north of Massey, along Highway 553 in Espanola District. Elsewhere populations were generally light.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* Roh.

Further to information presented in the Summer Survey Bulletin, this insect was found in high numbers in several areas in the Northern, North Central and Northwestern regions. In the Northern Region, heavy infestations were reported on snow hedges and windbreaks along highways in the Timmins and Kirkland Lake districts as well as in a 300-ha black spruce plantation in Stock Township, Timmins District. High populations also recurred in plantations in Glackmeyer and Calder townships, Cochrane District. In the North Central Region, heavy infestations were reported in small white spruce plantations near Farley Lake, Atikokan District and near Triangle Lake, Nipigon District. High populations



also occurred on planted white spruce trees along the natural gas pipeline in Lyon and McTavish townships, Thunder Bay District. Pipeline plantings were also severely defoliated in the Ignace District of the Northwestern Region where approximately 6 ha were affected. A 1-ha black spruce plantation in Echo Township, Sioux Lookout District was severely defoliated along with small numbers of open-grown trees in Wainwright Township and in the Gullwing Lake and Perrault Falls areas of Dryden District and the War Eagle Lake area of Kenora District. Ornaments, open-grown and fringe trees sustained varying degrees of damage at numerous other locations in northern Ontario.

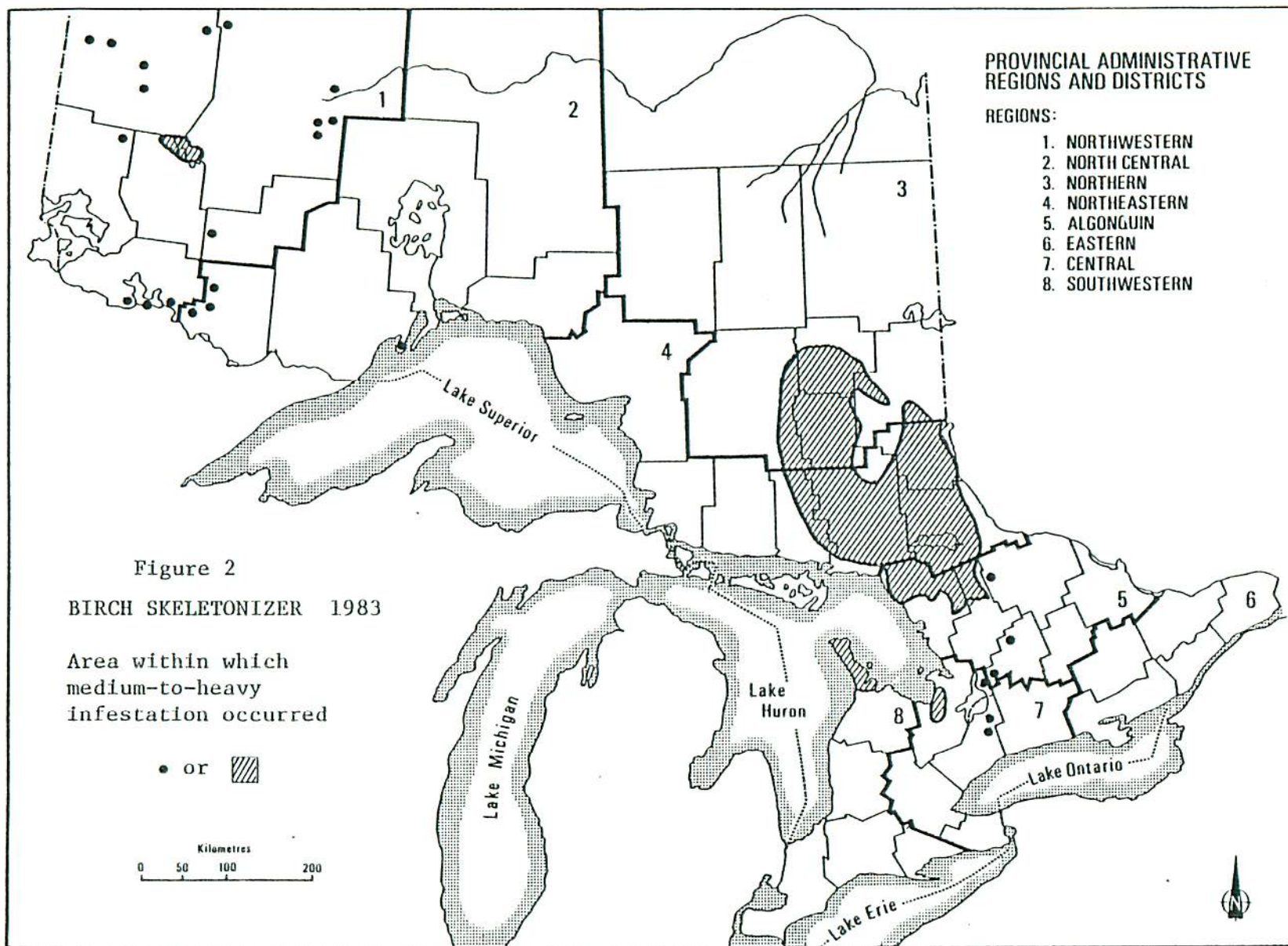
Maple Trumpet Skeletonizer, *Epinotia aceriella* (Clem.)

Unusually heavy infestations of this late-season pest were reported from the Northeastern and Algonquin regions. A heavy infestation occurred south of Lake Nipissing in parts of 11 townships in the North Bay, Parry Sound and Bracebridge districts where a total of approximately 135,000 ha of sugar maple were affected. Heavy infestations also occurred in the Southwestern Region, where a 68-ha stand at Pearce Provincial Park in the Aylmer District was heavily attacked for the second consecutive year. High populations were present in Albemarle, Eastnor, Amabel, Osprey and Collingwood townships of the Owen Sound District, where defoliation averaged 45% over a total area of about 600 ha. Small patches of medium infestation were reported from several locations in Essa Township, Huronia District, Nassagaweya Township, Cambridge District and near Port Burwell, Aylmer District.

Birch Skeletonizer, *Bucculatrix canadensisella* Chamb.

The overall area within which this insect caused moderate-to-severe defoliation of white birch in Ontario this year (Fig. 2) was 46,517 km<sup>2</sup> in comparison with 82,300 km<sup>2</sup> in 1982. In northwestern Ontario the area within which moderate-to-severe defoliation of white birch occurred declined to 1,900 km<sup>2</sup> from the 25,000 km<sup>2</sup> reported in 1982. Most of the infestations in this part of the province were in scattered pockets located from the western Atikokan District north and west through parts of the Fort Frances, Kenora, Dryden, Ignace, Sioux Lookout and Red Lake districts. The large infestation that was located in the southern Thunder Bay, Nipigon and Geraldton districts in 1982 was reduced to occasional small patches of moderate-to-severe defoliation, the largest of which was on the Sibley Peninsula of Thunder Bay District. Aerial mapping of this pest was very difficult in this part of the province, because of large areas of drought that caused premature discoloration and leaf fall on white birch and obscured the effects of the skeletonizer.

Infestation declines were also reported in northeastern Ontario where 37,465 km<sup>2</sup> were affected in comparison with 57,200 km<sup>2</sup> in 1982.



Nevertheless, large areas remain infested in the Timmins, Chapleau, Gogama, Kirkland Lake, Temagami, Espanola, Sudbury and North Bay districts (Fig. 2).

In southern Ontario, the area of moderate-to-severe defoliation increased from 100 km<sup>2</sup> in 1982 to 7,152 km<sup>2</sup>. The largest portion of this (4,811 km<sup>2</sup>) was in the northern parts of the Parry Sound and Bracebridge districts contiguous with the heavy infestations described above in the Sudbury and North Bay districts. The remainder, some 2,289 km<sup>2</sup>, consisted of large areas in the Bruce Peninsula of Owen Sound District and an area in the northern Huronia District. Small scattered patches of moderate-to-severe defoliation totalling approximately 52 km<sup>2</sup> occurred in the eastern Huronia District as well as in parts of the Maple, Minden and Algonquin Park districts.

Swaine Jack Pine Sawfly, *Neodiprion swainei* Midd.

The Swaine jack pine sawfly infestation in northeastern Ontario peaked in 1981 when an area of 5,699 ha of jack pine was moderately to severely defoliated in the Banks-Makobe Lakes area of the adjacent Kirkland Lake and Temagami districts. The following year, moderate-to-severe defoliation declined to about 4,650 ha.

In 1983, populations continued to decline to the point at which defoliation was insignificant over most of the previously infested areas. Two small pockets of medium infestation, totalling 518 ha, remain in the Banks-Wallis infestation north of Banks Lake. These were located in the western part of Banks Township along the Makobe River and in Willet Township on the southwest side of Alexander Lake. Small numbers of colonies were present in the remainder of the areas infested in 1982 but in all cases defoliation was negligible.

Gypsy Moth, *Lymantria dispar* L.

The gypsy moth situation in southern Ontario was described in the Summer Survey Bulletin. A total of 40,954 ha of moderate-to-severe defoliation was mapped in the Eastern Region in 1983, a considerable increase from the 4,800 ha detected in 1982.

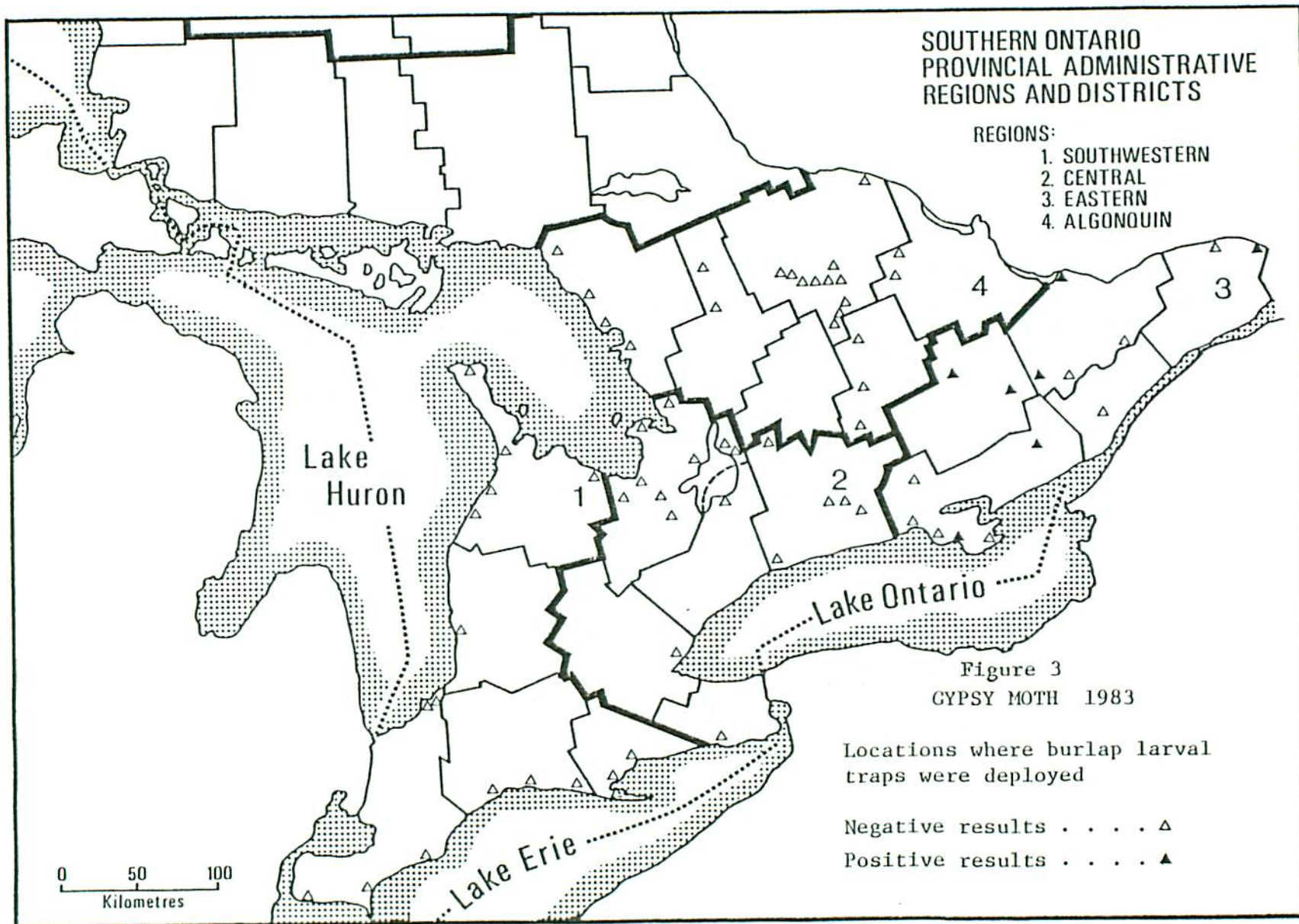
The insect was known to be present in several locations in London, Niagara Falls, Kitchener, Burlington and Oakville, all of which are outside the Eastern Region. Various types of control operations were carried out in these small incipient infestations, and all appear to have achieved some degree of success, as no larvae were found in 1983 except in the Oakville infestation, where a few larvae were reported.

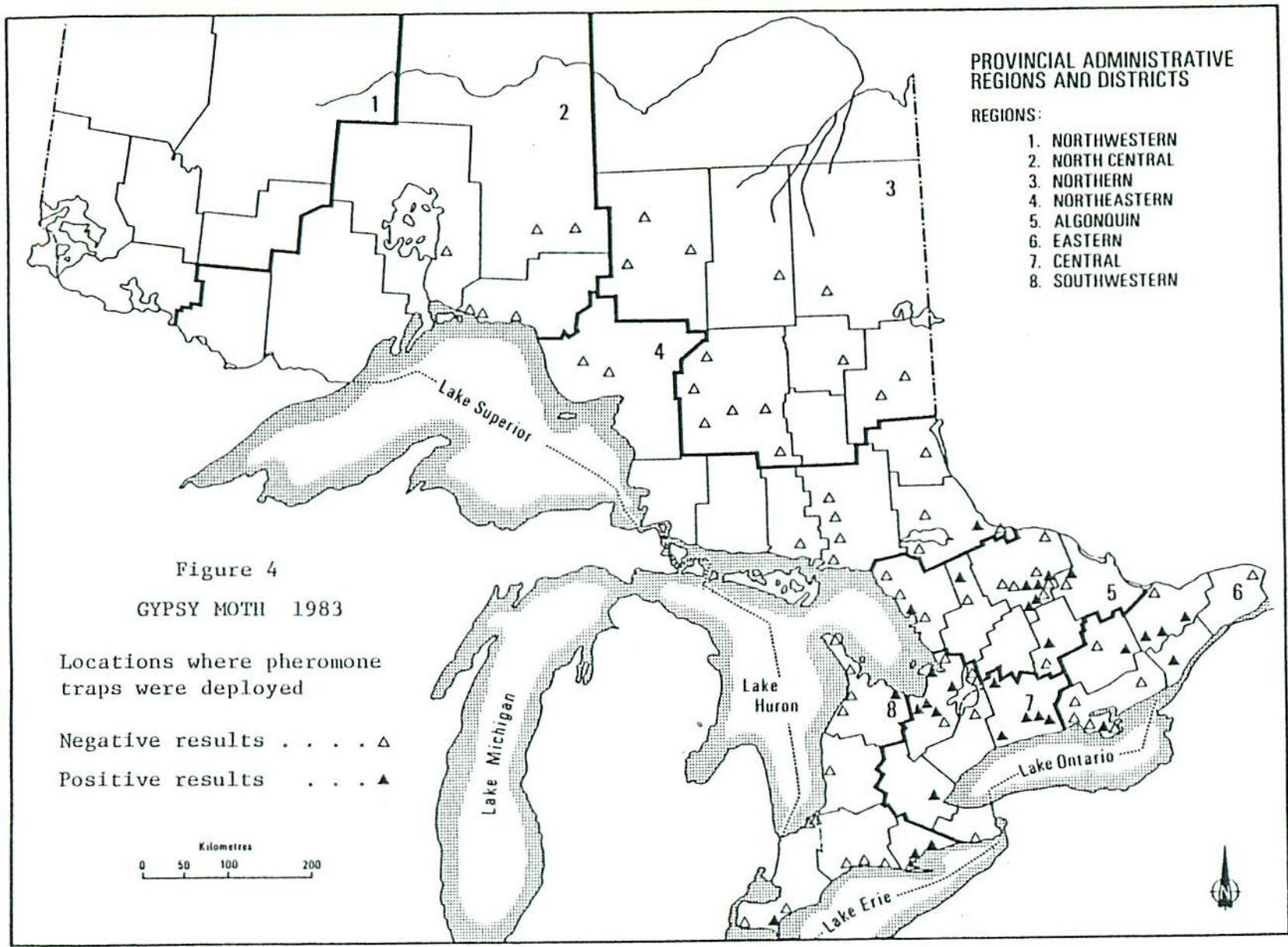
This year the FIDS Unit in cooperation with the Parks Branch of the Ontario Ministry of Natural Resources carried out a larval trapping

program and an adult pheromone trapping program in most provincial parks in southern Ontario. The larval trapping method takes advantage of the habit that late-instar larvae of the gypsy moth have of descending the trees during the day to hide. Burlap strips tied around tree trunks with a cord, the top half being folded over the bottom half, make ideal shelter and hiding places for the larvae, which are then easily captured. Parks personnel and FIDS rangers deployed 10 burlap traps in each of 71 parks selected in southern Ontario. Parks personnel inspected the traps periodically and forwarded suspect larvae to the Sault Ste. Marie laboratory for identification. Positive catches were made at the seven provincial parks in the Eastern Region: Carillon, Silver Lake, Sharbot Lake, Sandbanks, Frontenac, Fitzroy and Bon Echo. Results at all other parks were negative (Fig. 3).

As mentioned above, a pheromone trapping program designed to catch adult male moths was carried out in the same southern Ontario parks in which larval trapping took place. Two traps were deployed at each park and were left in place during the entire adult flight period. They were collected late in the season and catches were confirmed at the Sault Ste. Marie laboratory. Positive catches were made in 31 of the 71 parks in which trapping was carried out (Fig. 4). Although the largest numbers of moths were captured in parks in the Eastern Region where the insect has been established for several years, significant numbers were also captured in a number of other parks: Silent Lake (29), Bancroft District; Darlington (11), Emily (5), Marks Burnham (11) and Serpent Mounds (10), Lindsay District; Wasaga Beach (6), Huronia District; Bronte Creek (25), Cambridge District; and Turkey Point (5), Simcoe District. Small numbers of moths, usually one or two, were also caught in the following parks: Mikisew, Bracebridge District; Wheatley, Chatham District; Craigeleith, Owen Sound District; Awenda, Bass Lake, Devils Glen and Springwater, Huronia District; Killbear, Parry Sound District; and Kearny Lake, Lake of Two Rivers, Mew Lake, Coon Lake and Rock Lake Campgrounds in Algonquin Provincial Park, Algonquin Park District.

For the past several years FIDS and Agriculture Canada have carried out a cooperative gypsy moth pheromone trapping program in northern Ontario. This year 90 pheromone traps were deployed in 35 provincial parks and campgrounds in the Northern, North Central and Northeastern regions. A number of extra traps were set out at White Lake Provincial Park in the Wawa District where a single male moth was captured in 1982. Results were negative at this location and at all other parks except for Champlain Provincial Park near Mattawa in the North Bay District, where a single male moth was recovered. Increased emphasis will be placed on trapping operations in this park in 1984.





Jack Pine Budworm, *Choristoneura pinus pinus* Free.

The status of the jack pine budworm in Ontario was described in the Summer Survey Bulletin. Populations increased sharply with a total area of 67,142 ha of jack pine moderately to severely defoliated in 1983 in comparison with 981 ha in 1982. Infestations occurred in three main areas: the northern and western Parry Sound District; the southern portions of the Sudbury, Espanola and Blind River districts; and the southern Atikokan District in Quetico Provincial Park, adjacent to the United States border. Egg-mass surveys were completed in August and September with the following results. The infestation in the Parry Sound District will probably maintain itself at about the same level, although a small expansion in area is possible in 1984. Egg-mass counts in the Sudbury, Espanola and Blind River districts were somewhat restricted because of the inaccessibility of many infestations but those which were carried out indicate that infestations will probably persist at about the same level next year.

In the Atikokan District, the infestation will probably persist at high levels, and there is a possibility of some expansion to the north-east in the Sarah Lake area.

White Pine Weevil, *Pissodes strobi* (Peck)

In southern Ontario, populations remained generally low except in areas in the Huronia and Owen Sound districts. The most severe damage was in Tay and Orillia townships, Huronia District and in Holland Township, Owen Sound District. Here, white pine plantations ranging in size from 2 to 5 ha suffered leader damage of 46%, 22% and 24%, respectively. In the Owen Sound District, increased populations in substantial areas of planted white pine have prompted a clipping and burning program to control the insect. Elsewhere in southern Ontario, populations were generally low except in a few areas in the Pembroke and Algonquin Park districts where numbers of infested leaders ranged from 2 to 19%.

The highest populations in northern Ontario were in the Espanola and Sudbury districts where white pine plantations totalling 65 ha in area had leader damage ranging from 18 to 60%. Generally low or declining numbers were reported from the remainder of northern Ontario with the following exceptions: in Hartman Township, Dryden District, where a 1-ha jack pine clonal orchard had 20% leader damage; in a 5-ha jack pine stand in Dalmas Township, Chapleau District, which had 21% leader damage; in Patton Township, Blind River District where a 5-ha white pine plantation had 24% leader damage; and in Barr Township, Temagami District where a 20-ha jack pine plantation suffered 12% damage. Elsewhere quantitative sampling showed that leader damage was usually less than 8%.

Solitary Oak Leafminer, *Cameraria hamadryadella* (Clem.)

This insect was reported in varying numbers from several locations in southern Ontario. The highest populations occurred in the Southwestern Region where severe defoliation was reported on 25 ha of scattered white oak near Kilworth in Lobo Township and near the city of London in London Township. Defoliation in the 40-50% range was also observed on scattered white oak near St. Marys in the Wingham District. In the Central Region, moderate foliar damage occurred on ornamental and fringe white oak along the Niagara Parkway from Niagara Falls to Niagara-on-the-Lake. Reports of the insect were also received from the Eastern Region where a heavy infestation occurred in a small stand of bur oak in Fitzroy Township, Carleton Place District and a medium infestation occurred in a 05.-ha stand of bur oak in Front of Yonge Township, Brockville District. Low populations were also reported on red oak in Bouck Township, Blind River District and in Plummer Additional Township, Sault Ste. Marie District.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Generally low and declining populations were reported in the province in 1983. In Laura Township, Sudbury District an infestation that severely damaged red pine trees in a 15-ha plantation in 1982 collapsed this year when no larvae were encountered. The only infestation of any significance in northern Ontario was in a 5-ha red pine plantation on Manitoulin Island in the Espanola District where 6% of the trees had defoliation averaging 10.5%. In southern Ontario, populations were also at a low ebb with very little damage reported. Small incipient infestations were treated with virus at three locations in the Algonquin Region and malathion was used to control two infestations in the Eastern Region. Single trees and small clumps of trees sustained moderate defoliation at a few locations in Tay, Floss and Medonte townships, Huronia District.

Redhumped Oakworm, *Symmerista canicosta* Francl.

Populations of this hardwood defoliator declined drastically in 1983. Infestations on about 2,100 ha of red and bur oak in the Thirty Thousand Islands in Parry Sound District collapsed this year when only a small pocket of about 2 ha of moderate-to-severe defoliation was mapped on a small island in Spider Bay. A similar collapse occurred in the Pinery Provincial Park-Grand Bend area of Chatham District where populations had been high on white and red oak within an area of about 3,500 ha for the past two years. The only other report of the insect was from Beausoleil Island in the Georgian Bay Islands National Park, Huronia District where small numbers of larvae were found commonly on red oak.



Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)

Higher populations caused increased foliar damage in a number of districts in northern Ontario. Generally immature trees on the fringes of cutovers and along roadsides suffered the most severe damage; however, at one location in the Vincent and Zuza lakes area of Sioux Lookout District, approximately 3,00 ha of semimature trembling aspen were severely defoliated. Small scattered patches of heavy infestation were common in the remainder of the Northwestern Region, although at one location in Zealand Township, Dryden District, parasitism levels were in excess of 98%. Heavy infestations of small trees were common in most of the North Central Region and in the Kapuskasing, Cochrane, Hearst, Chapleau and Gogama districts of the Northern Region. Populations declined generally in the Espanola, Sudbury and North Bay districts of the Northeastern Region. Scattered light-to-medium infestations were reported from the Algonquin Region of southern Ontario.

Northern Pitch Twig Moth, *Petrova albicapitana* (Busck.)

This insect was reported as being widespread in a number of regions; however, in most cases populations were low and damage was light. At one location in Hartman Township, Dryden District a 1-ha jack pine clonal test plot had 55% of the trees suffering main stem attack.

Pine Webworm, *Tetralopha robustella* Zell.

Unusually high populations of this insect occurred in jack pine stands in Forgie, Melick and Coyle townships, Kenora District and near Caliper Lake in Claxton Township, Fort Frances District. The highest populations were recorded in an 8-ha stand in Forgie Township where 80% of the trees were infested, although most trees were only lightly defoliated.

European Pine Needle Midge, *Contarinia baeri* (Prell)

Heavy infestations that occurred on planted red pine in four townships in the North Bay and Sudbury districts in 1982 collapsed in 1983. New areas of heavy infestation were reported in Scots pine plantations on St. Joseph Island and in VanKoughnet and Fenwick townships, Sault Ste. Marie District, where a total area of about 40 ha was infested. The insect also caused moderate leader damage to approximately 25 ha of Scots pine trees in Keppel and Amabel townships, Owen Sound District.

Oak Skeletonizer, *Bucculatrix ainsliella* Murt.

The Summer Survey Bulletin described unusually heavy infestations of the first generation of this insect, which occurred primarily on red oak in the Central and Eastern regions. Infestations of the second generation were present in virtually the same areas, with similar damage levels. In the Central Region, moderate-to-severe defoliation was mapped within a total area of about 1,810 km<sup>2</sup>, located as follows: approximately 1,000 km<sup>2</sup> in the Niagara District, in the Welland, Font-hill and Thorold areas and along the Niagara Parkway; approximately 800 km<sup>2</sup> in the Cambridge and Maple districts in the Kitchener-Cambridge-Ancaster-Oakville areas and in the Oak Ridges and Whitchurch and Uxbridge townships areas; and about 10 km<sup>2</sup> in the Lindsay District in the Ganaraska Forest and in areas to the east in Northumberland County.

Heavy infestations were also reported in a total area of about 15 ha in Olden and Lavant townships in Tweed and Carleton Place districts in the Eastern Region. Small numbers of larvae were observed in the Simcoe-Waterford area of Simcoe District in the Southwestern Region; however, defoliation was negligible.

#### Other Noteworthy Insects

Populations of the walnut caterpillar, *Datana integerrima* G. & R., which began declining in 1982, continued to do so in 1983. Only small numbers of colonies were reported, usually on black walnut, in a few locations in southern Ontario.

Light-to-moderate damage by the jack pine tip beetle, *Conophthorus banksianae* McPherson, was reported from the Espanola, North Bay, Chapleau and Gogama districts. High numbers occurred in a 4-ha jack pine plantation in Marlborough Township, Carleton Place District.

The jack pine resin midge, *Cecidomyia resinicola* (O.S.), caused heavy twig damage in a 4-ha jack pine plantation in Marlborough Township, Carleton Place District.

High populations of the red pine coneworm, *Eucosma monitorana* Heinr., occurred in a red pine seed production area in Cambridge Township, Cornwall District.

Heavy infestations of the woolly elm aphid, *Eriosoma americanum* (Riley), caused heavy foliar damage to a small area of roadside white elm trees in Rolph Township, Pembroke District.

High numbers of the fir coneworm, *Dioryctria abietivorella* (Grt.), were found on black spruce cones along the Slean Lake Road and small numbers were observed elsewhere in the Sioux Lookout District.

Populations of the spearmarked black moth, *Rheumaptera hastata* (Linn.), on white birch declined to low levels in the Chapleau and Gogama districts and small numbers were reported from the Sioux Lookout, Ignace and Red Lake districts.

The willow leafblotch miner, *Phyllonorycter kenora* (Free.), was found in high numbers in the Sioux Lookout, Ignace and Red Lake districts and in Stoddart Township, Hearst District.

The balsam poplar leafblotch miner, *Phyllonorycter nipigon* (Free.), was reported at medium and high population levels from a number of widespread locations on balsam poplar in the Northwestern Region and in Ottaway and Clute townships, Cochrane District.

Populations of the shorthorned oakworm, *Anisota finlaysoni* Riotte, caused light defoliation of scattered white oak trees near Milton, and in Blenheim Township, Cambridge District.

The birch sawfly, *Arge pectoralis* Leach, caused moderate-to-severe defoliation of individual white birch trees and clumps of trees at scattered points on the Bruce Peninsula in the Owen Sound District.

Moderate seedling mortality of sugar maple in a 10-ha woodlot in Tiny Township, Huronia District was caused by an infestation of the pitted ambrosia beetle, *Corthylus punctatissimus* Zimm.

Unusually heavy infestations of the striped sumac leafroller, *Nephoteryx subfuscella* Rag., occurred on wild and ornamental sumac at a number of points in the Huronia and Owen Sound districts.

Heavy damage by the small birch leafminer, *Ectoedemia lindquisti* (Frees.), recurred on white birch along the Georgian Bay shoreline in Awenda Provincial Park, Huronia District.

The alder flea beetle, *Altica ambiens alni* Harr., caused severe defoliation of alder in numerous areas in the Thunder Bay, Chapleau and Kirkland Lake districts.

High populations of the balsam fir bark beetle, *Pityokteines sparsus* Lec., were associated with dying budworm-damaged balsam fir trees in a 1-ha area in Strathearn Township, Chapleau District.

High populations of the wooly pine needle aphid, *Schizolachnus piniradiatae* (Dav.), occurred on shoreline red pine in Agawa Provincial Park, Wawa District.

Open-grown trees and clumps of white birch supported heavy infestations of the ambermarked birch leafminer, *Profenusa thomsoni* (Konow), in the Marathon area of Terrace Bay District.

The southern pine engraver beetle, *Ips grandicollis* (Eich.), and the pine engraver beetle, *Ips pini* (Say), were associated with drought-damaged red pine at a number of locations in the Huronia, Maple and Fort Frances districts.

Heavy infestations of the pine bark adelgid, *Pineus strobi* Htg., were reported in white pine plantations in Edwardsburgh Township, Brockville District and Charlotteville Township, Simcoe District. The insect was also reported from numerous other areas, usually at low population levels.

Unusually heavy infestations of the cherry scalloped moth, *Hydria prunivorata* Ferg., which occurred on black cherry at a number of locations in the Maple and Owen Sound districts in 1982, declined to very low levels in 1983.

Unusually high populations of the pine needle scale, *Chionaspis pinifoliae* (Fitch), were recorded in about 4,000 ha of mature jack pine in Cascaden and Cartier townships, Huronia District.

The red-humped caterpillar, *Schizura concinna* (J.E. Smith), caused conspicuous defoliation of roadside clumps of trembling aspen and willow at many locations in the Northwestern Region.

Generally low populations of the orangestriped oakworm, *Anisota senatoria* (J.E. Smith), were observed on red oak at a number of locations in the Southwestern Region. Populations at Pinery Provincial Park in the Chatham District were heavily infected with a nuclear polyhedrosis virus.

The needle tier, *Sparganothis sulfureana* Clem., was found in unusually high numbers in a small red pine plantation in Allan Township, Espanola District where 62% of the leaders were attacked.

A heavy infestation of the satin moth, *Leucoma salicis* Linn., on silver poplar in Thurlow Township, Napanee District represents a slight extension in the range of this introduced insect.

A heavy infestation of the needle tier, *Sparganothis unifasciana* Clem., on jack pine seedlings in two compartments of the G. Howard Ferguson Forest Station, Brockville District was successfully controlled with the insecticide malathion.

## TREE DISEASES

### Leaf Cast of Larch, *Meria laricis* Vuill

This disease was found this year for the first time in Ontario in Sullivan Township, Owen Sound District. It was described in the Summer

Survey Bulletin. The disease has since been recovered at one other location in Harwick Township, Chatham District. At this location about 30 trees, 3 m high, were heavily infected. It is probable that the disease has been present here for some time as some trees have died and branch mortality is evident on those remaining.

Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. and Schw.) d By and *C. ledicola* Lagh.

As usual these foliar diseases of black and white spruce were widely distributed in northern Ontario but foliar damage was usually less than 5%. Exceptions to this trend occurred in Red Lake, Sioux Lookout and Ignace districts where infection levels in several stands reached 100% and foliar damage ranged from 25% to 100%. Another area of high infection was located on the Mawn Lake Road, Thunder Bay District where a 20-ha black spruce stand had 100% of the trees infested and 40% foliar damage. Several areas in the Geraldton and Terrace Bay districts had 100% of the trees affected with defoliation levels ranging from 15 to 25%.

Shoestring Root Rot, *Armillaria mellea* (Vahl. ex Fr.) Kummer

Extensive surveys were carried out for this organism in northern Ontario. Results showed that although the disease was present in many stands, losses in most cases were less than 2%. Exceptions were in Dalmas Township, Chapleau District where two jack pine stands, 40 ha and 30 ha in size, had 8 and 4% mortality, respectively. In a black spruce progeny test about 1 ha in size at Turtle Lake in the Fort Frances District, the disease caused 11.6% mortality.

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Moreau

Surveys in the Northwestern Region where this disease has become established in recent years showed little change in its distribution. However, infection levels continued to intensify in areas in which the disease was already established. For example, an urban survey in the town of Emo, Fort Frances District, revealed that 35% of the elms examined had been killed by the disease and another 14% were seriously damaged. Elsewhere the disease continues to destroy surviving elms throughout most of its range in the province.

Fireweed Rust, *Pucciniastrum epilobii* Otth.

A heavy infestation of this rust disease occurred in a 5-ha balsam fir stand in the Eldorado Lake area of Sioux Lookout District. Light infections were observed on small numbers of trees at several points

along the Vermillion River Road, Sioux Lookout District and along the Chukuni Lake Road, Red Lake District. Similar infection levels were reported in the eastern part of Darker Township, Dryden District and in the southern part of Woodyatt Township, Fort Frances District.

Tip Blight, *Sphaeropsis sapinea* (Fr.) Dyko and Sutton

This organism has been collected with increasing frequency since 1977 on most species of pine in southern Ontario. Although the native species, white pine, red pine and jack pine, usually suffer light damage, imported species, particularly Scots pine and Austrian pine, are often severely damaged and there have been some cases of heavy tree mortality.

This year, high infection levels were detected in Scots pine plantations at a number of locations in the Maple and Cambridge districts of the Central Region and in the Wingham District of the Southwestern Region. Moderate infection levels were reported from Cramahe Township, Napanee District and Clarence Township, Cornwall District in the Eastern Region. Infection levels ranged from 75 to 100% and tree mortality as high as 19% was recorded (Table 3).

Table 3. Summary of damage caused by tip blight in five Scots pine plantations in southern Ontario in 1983.

District	Township	Tree ht (m)	Area affected (ha)	Trees affected (%)	Trees severely affected (%)	Trees dead (%)
Maple	Uxbridge	13	8	79	26	2
	Whitchurch	17	5	75	9	0
Cambridge	Beverley	11	10	96	49	19
	Nassegawaya	11	6	99	63	7
Wingham	East Wawanosh	10	30	100	100	7

#### Single-tree Mortality of Balsam Fir

This condition, the cause of which is unknown, is characterized by the sudden death of single trees and small groups of balsam fir. In the Kapuskasing, Cochrane and Hearst districts, the condition was much more prevalent in 1983 than it has been for several years. Of particular

concern was the sudden death of balsam fir at Remi Lake Provincial Park, where an evaluation in one area revealed 6% current mortality. Long periods of hot, dry weather during the summer may have been a contributing factor in the sudden increase in this condition.

#### Drought

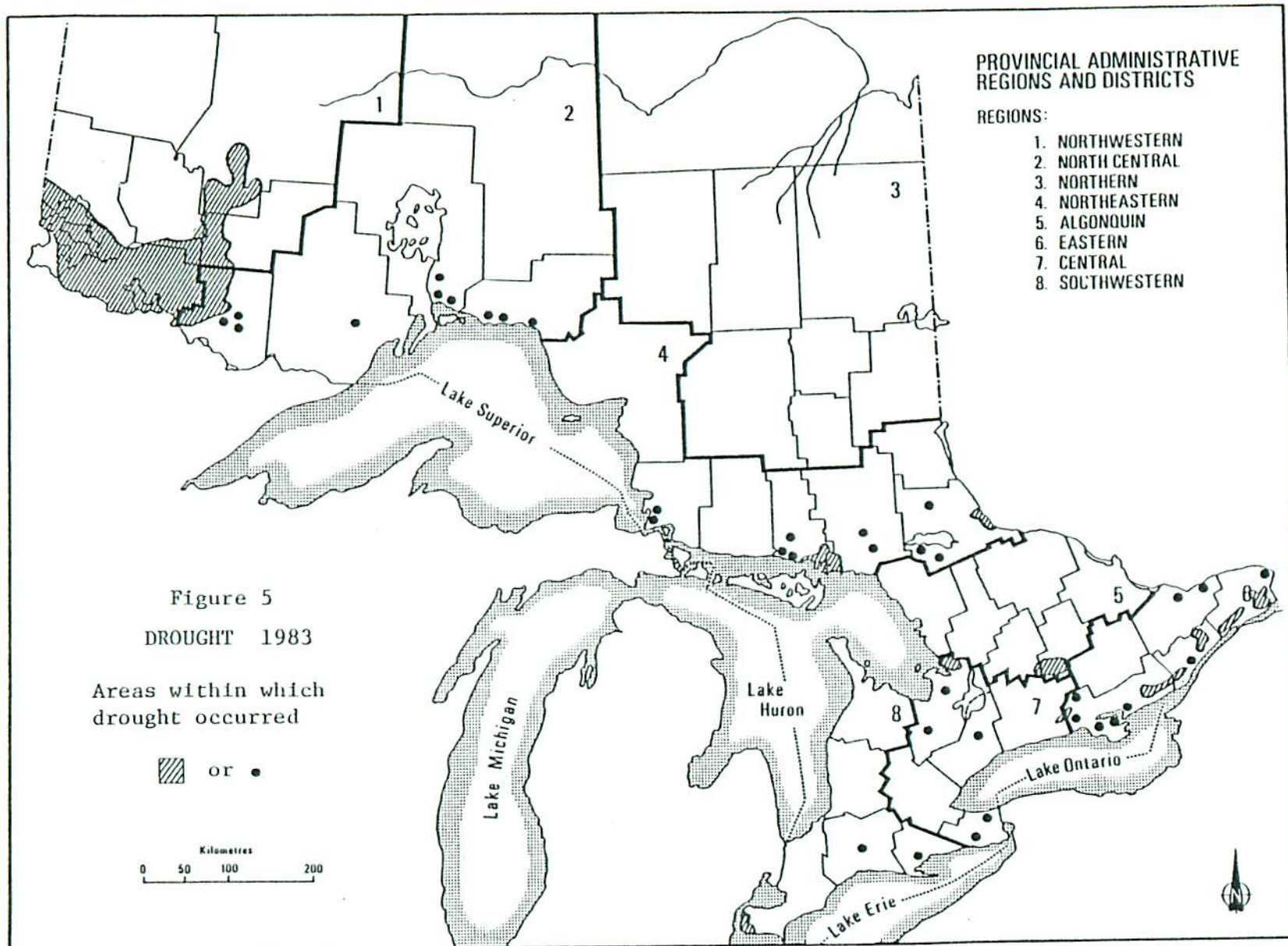
High temperatures combined with low rainfall were probably responsible for varying degrees of drought damage in Ontario in 1983. Most tree species were affected to some degree, but generally white birch and trembling aspen, followed by jack pine and red pine, were affected in northern Ontario while maple and oak, along with white pine, were most often damaged in southern Ontario. Trees growing on poor sites, such as thin, sandy soils and rocky ridges and lakeshores, were most often affected. The most widespread and severe damage occurred in northwestern and southeastern Ontario. In northwestern Ontario, early foliage discoloration and premature leaf drop occurred on white birch and trembling aspen in a large area from the Manitoba border east to the Atikokan District. Red pine and jack pine mortality in scattered pockets ranging from a few trees to about 5 ha were detected in the southern Fort Frances and Kenora districts. A total area of about 27,200 km<sup>2</sup> was affected by this type of damage in northwestern Ontario (Fig. 5).

In southeastern Ontario, damage occurred in large patches in the Bancroft and Minden districts of the Algonquin Region and in the Cornwall, Brockville and Napanee districts of the Eastern Region. The most severe damage was recorded in Burleigh Township, Bancroft District, where evaluations showed red oak mortality as high as 46%. In this part of the province damage was recorded within a total area of approximately 1,150 km<sup>2</sup>.

Less severe damage, usually in the form of discolored foliage on single trees and small clumps of trees, was reported sporadically in the Central Region and in the southern part of the Southwestern Region. The same type of damage occurred in the Sudbury, Espanola and North Bay districts of the Northeastern Region and in the Nipigon and Terrace Bay districts of the North Central Region.

#### Wind Damage

High winds caused severe blowdown in three districts in 1983. In the Atikokan District, approximately 650 ha were affected in three separate pockets in the northern part of the district. Various tree species were affected. Severe thunderstorms and high winds on 7 August were responsible for several large areas of downed timber in Kinears and Harewood townships, Cochrane District. Mapping of the area affected was not completed; however, it was determined that black spruce, poplars and





white birch were the principal species affected. In the Chapleau District, a severe July storm caused approximately 200-ha of white birch and trembling aspen blowdown east of Biscotasi Lake.

#### OTHER DISEASES OF NOTE

A leaf spot disease, *Tubakia dryina* (Sacc.) Sutt., caused severe foliar damage to red oak in a 0.5-ha stand near Blenheim in Harwick Township and in a 3,000-ha area of red oak in Bosanquet Township, Chatham District.

Ornamental horse chestnut suffered severe foliar damage from horse chestnut leaf blotch, *Guignardia aesculi* (Pk.) Stewart, at numerous locations in the Central and Southwestern regions.

A leaf spot disease, *Mycosphaerella populicola* G.E. Thomps., caused severe discoloration and premature leaf drop of balsam poplar over wide areas in the southern part of Manitoulin Island, Espanola District and in the Kenora, Fort Frances and Dryden districts.

A leaf blister rust, *Taphrina caerulescens* (Mont. & Desm.) Tul., caused 20% defoliation of scattered red oak in the Pinery Provincial Park-Grand Bend area of Chatham District and 10% defoliation of scattered red oak in Bertie Township, Niagara District. The disease was also reported at low levels in the town of Renfrew, Pembroke District.

Active pockets of Fomes root rot, *Heterobasidium annosum* (Fr.) Bref., were recorded at three locations in the Limerick Forest, Brockville District and at five locations in the LaRose Forest, Cornwall District. Two small active pockets were also reported from Compartment 261 in the Tosorontio Tract of the Simcoe County Forest, Huronia District.

The dwarf mistletoe, *Arceuthobium pusillum* Pk., was responsible for a pocket of 40 dead and dying spruce trees near the Angus Gate at Canadian Forces Base Borden in the Huronia District.

Septoria canker, *Septoria musiva* Pk., caused heavy premature leaf drop of balsam poplar at many locations in the Thunder Bay, Atikokan, Fort Frances, Dryden and Kenora districts.

Heavy infections of the larch-poplar rust, *Melampsora medusae* Thuem., occurred on B-7 and B-8 hybrid poplar clones at the G. Howard Ferguson Forest Station, Brockville District. Light-to-moderate infections occurred on other hybrid poplar clones at the same location.

The root rot fungus, *Bjerkandera adusta* (Fr.) Karst., caused severe root damage to hybrid poplar in one compartment at the G. Howard Ferguson Forest Station, Brockville District.

A needle cast disease, *Lophodermium* sp. (probably *seditiosum*), caused 30% mortality of red pine seedlings in two compartments at the G. Howard Ferguson Forest Station, Brockville District.

The damping off fungi, *Fusarium* sp., caused 10-15% damage on eastern white cedar and white pine seedlings in one compartment at the St. Williams Forest Station, Simcoe District.

A hail storm caused 14% twig damage in a 50-ha jack pine stand in Memaskwosh Township, Wawa District.

A snowstorm with 35 cm of wet snow in early June broke branches and bent and uprooted fringe jack pine and trembling aspen in the area of Halfway Provincial Park, Sudbury District.

### RETIREMENT



Harvey Weir

Harvey Weir, a regional supervisor with the Forest Insect and Disease Survey Unit, retired on 6 October, 1983 after more than 31 years with the Department. Harvey served with the Royal Canadian Navy from 1942 to 1945 in the North Atlantic. After the war, he worked at Algoma Steel, a tourist camp, Roddis Lumber and the A & P before joining the Department in April 1952.

Harvey has served as a ranger in a number of districts in Ontario including White River, Pembroke, Kenora, Sault Ste. Marie, Thunder Bay and Minden. He has made many contributions to the Department, particularly in terms of the excellent relationships that he established with OMNR staff wherever he served. Perhaps his most lasting contribution will be the historical reports on forest pests prepared under his leadership.

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