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SURVEY BULLETIN

Forest Insect and Disease Conditions in Ontario

Fall 1981

Survey field technicians sampling the mid-crown of a balsam fir tree for spruce budworm egg masses.

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CORRECTION

The Summer 1981 issue of the Survey Bulletin (p. 4) contained a summary of aerial spraying operations conducted against spruce budworm by the Ontario Ministry of Natural Resources. Several of the figures used were incorrect and the revised section should read as follows:

Approximately 10 233 ha of high-value spruce-fir forests and plantations were treated with a variety of insecticides including Matacil (3 225 ha), Dipel 88 (3 103 ha), Thuricide 16B (3 473 ha), Thuricide 32 BX (324 ha) and virus (108 ha).

Forest Insect and Disease Conditions in Ontario

Fall 1981

This is the third of three bulletins to be issued by the Forest Insect and Disease Survey Unit describing forest pest conditions surveyed during the 1981 field season.

ANNUAL FOREST PEST REVIEWS

The annual forest pest reviews for Ontario will be held again this fall, with the southern review scheduled for 19 November in Toronto and the northern review for 26 November in Sault Ste. Marie. The agenda for the southern review will include such topics as Scleroderris canker, spruce budworm, gypsy moth, the current status of pesticides and provincial spraying policies, insect pheromones for surveys and control, and Fomes root rot. Topics to be discussed at the northern review include spruce budworm, assessment of budworm damage by remote sensing, fire behavior in budworm-damaged stands, results of special surveys for white spruce cone and seed insects, and for white spruce plantation insects and diseases, and the current status of pesticides and provincial spraying policies. A feature film will be presented at both reviews.

FOREST INSECTS

Gypsy Moth Survey in Northern Ontario Parks

The Forest Insect and Disease Survey in cooperation with Agriculture Canada again carried out a pheromone trapping program for adult male gypsy moths in northern Ontario parks. A total of 80 pheromone traps were deployed in 35 parks, with special emphasis being placed on Rabbit Blanket Lake Campground, about 50 km south of Wawa. Although results were negative at Rabbit Blanket Lake this year, single male moths were captured at Obatanga Provincial Park about 30 km northwest of Wawa and at Windy Lake Provincial Park about 40 km northwest of Sudbury. Increased numbers of traps will be deployed at these locations in 1982.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

It was reported in the Summer (1981) Survey Bulletin that the gross area of forest infested by the spruce budworm in Ontario had declined in 1981 by some 633 000 hectares. Each of the three major regions of the province showed decreases in the area of moderate-to-severe infestation; however, the total infested area was still over 18 million hectares. The extent of defoliation in 1981 is compared with that in 1980 in the following summary.

Outbreak region in Ontario	Gross area defoliated ('000 000 ha) 1980	1981	Changes
Southern	1.007	.601	- .406
Northeastern	17.119	16.958	- .161
Northwestern	.724	.658	- .066
Total	18.850	18.217	- .633

Approximately 650 locations were sampled for egg-mass counts and defoliation estimates during August and September in a province-wide survey. On an overall basis, as in 1980, egg-mass densities declined by some 22%; however, there were major regional differences in that substantial increases occurred in some parts of Ontario in contrast to large declines in other parts of the province.

For the second consecutive year, the largest regional decline in egg-mass numbers, about 52%, occurred in southern Ontario. As a result, the total area of moderate-to-severe defoliation should continue to decline in 1982. Forecasts call for generally trace or light defoliation interspersed with numerous scattered small pockets of moderate-to-severe defoliation.

Similarly, in northeastern Ontario, egg-mass populations declined for the second consecutive year. An overall decrease of 46% occurred this year in comparison with 51% in 1980. All but two of the districts in the Northeastern and Northern regions showed significant decreases in egg-mass densities. The two exceptions were Hearst and Espanola, with 25% and 24% increases, respectively. Decreases in the other districts ranged from 18% to 90%. In the eastern part of the North Central Region, on an overall basis, egg-mass densities showed a slight increase of about 2% over those of 1980. A large decrease in Geraldton District was offset by increases in Terrace Bay and Nipigon districts. Forecasts call for moderate-to-severe defoliation throughout the area infested in 1981, with the exception that generally light defoliation with scattered pockets of moderate-to-severe defoliation should prevail throughout the central part of the outbreak. This would include most of Timmins, Chapleau and Gogama districts as well as large parts of Wawa, Blind River, Kirkland Lake and Cochrane districts. Some minor expansions of infestations may occur to the west and north in Terrace Bay, Geraldton and Hearst districts.

In northwestern Ontario, egg-mass densities more than doubled (i.e., the increase was 113% over all) in 1981. Large increases occurred

in Atikokan, Fort Frances, and Thunder Bay whereas egg-mass populations in Kenora declined somewhat. It is expected that the area of moderate-to-severe defoliation will increase by some 30-40% in 1982 to approximately 1.0 million ha.

As expected, the area of budworm-associated tree mortality continued to increase in 1981. The extent of tree mortality in 1981 is compared with that in 1980 in the following summary.

Region in Ontario	Gross area of budworm-associated tree mortality ('000 000 ha)		
	1980	1981	Increase
Southern	1.493	1.550	.057
Northeastern	6.839	9.572	2.733
Northwestern	.024	.088	.064
Total	8.356	11.210	2.854

A total of 11.210 million ha of tree mortality was mapped this year (Fig. 1). In southern Ontario, most of the area of new tree mortality occurred in Tweed and Parry Sound districts. In northeastern Ontario, the extent of budworm-associated tree mortality increased by approximately 2.733 million ha as new mortality was mapped in virtually every district with the exception of Moosonee in the Northeastern and Northern regions. In northwestern Ontario tree mortality continued to increase in the Fort Frances District to some 88 000 ha in 1981, up from 24 000 ha in 1980.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

As reported in the summer Survey Bulletin, infestations of this insect declined substantially in the Northeastern and Northern regions and increased marginally in the Thunder Bay District of the North Central Region. Egg-band counts carried out during August indicate that infestations in the Espanola and Sudbury districts of the Northeastern Region and in the Kirkland Lake, Kapuskasing and Cochrane districts of the Northern Region will continue to dissipate in 1982. Similar egg surveys in the Thunder Bay District indicate that the infestation there will probably persist and may expand somewhat to the south and west next year.

White Pine Weevil, *Pissodes strobi* (Peck)

In northern Ontario, numbers of this insect were generally low except in the Northeastern Region. Here, a number of white pine and

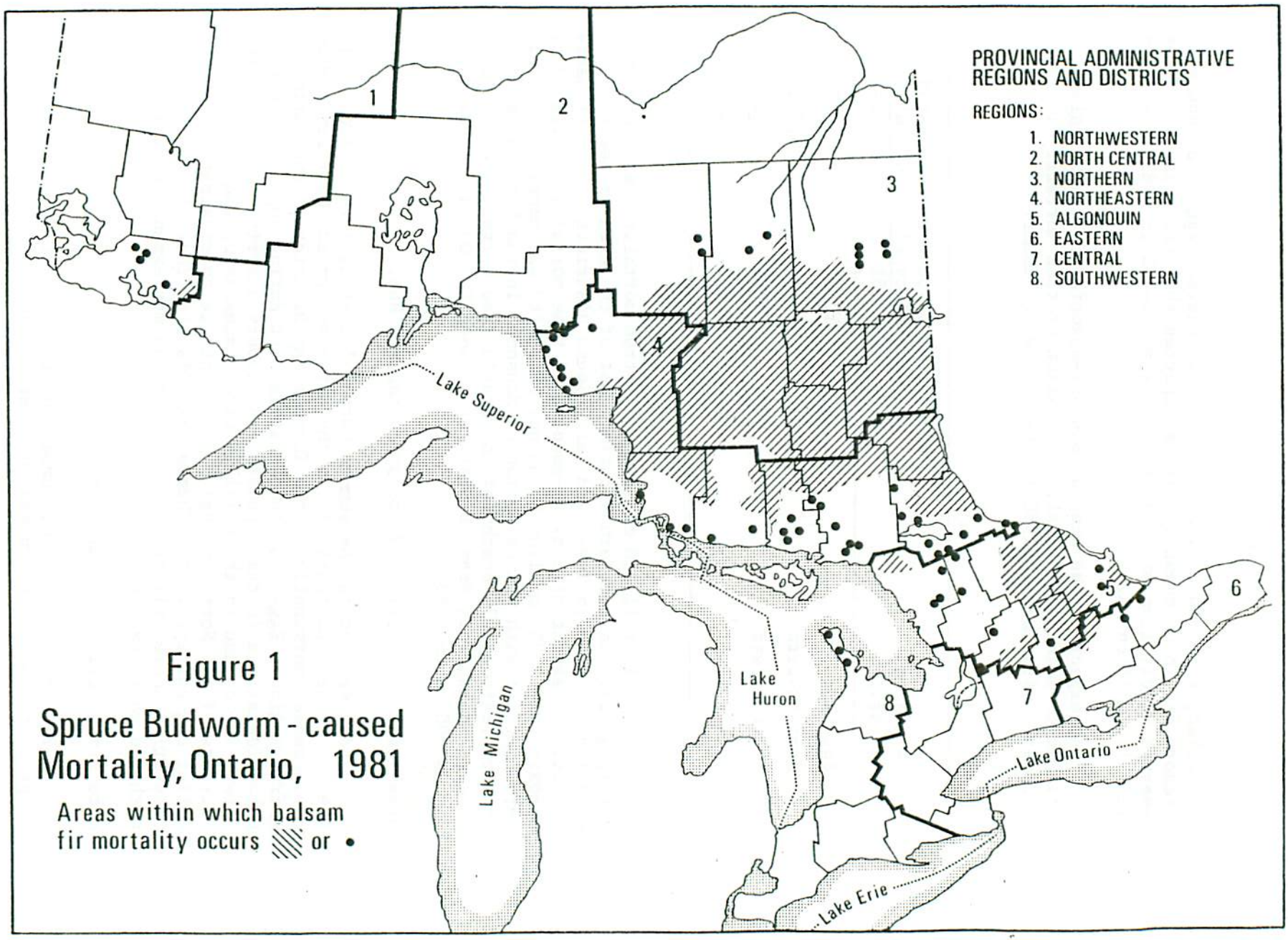

Figure 1

Spruce Budworm - caused Mortality, Ontario, 1981

jack pine plantations in Blind River, Sudbury and Espanola districts suffered 30% to 50% leader damage. Leader damage in a 2 ha plantation in Merritt Township, Espanola District declined from 75% in 1980 to 58% this year. Small pockets of moderate infestation with leader damage in the 20% range were reported in Barr Township, Temagami District and Ivanhoe Township, Chapleau District in the Northern Region. In the southern part of the province, populations appeared to be on the upswing with medium and high populations reported from many areas, particularly in the Algonquin and Central regions where a high percentage of trees were attacked. In the Eastern and Southwestern regions numbers were generally low and no serious damage was reported.

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

This introduced pest of pine occurs in several widely separated areas of the province. These are located as follows: the southern part of the Northwestern Region, the Central Region and eastern part of the Southwestern Region, a small area in the Cornwall District in the Eastern Region and in the Sault Ste. Marie area of the Northeastern Region. This year, in northwestern Ontario the insect extended its range from the central Fort Frances District, northward to Sioux Narrows in the Kenora District and to Dryden in the Dryden District. In southern Ontario slight range extensions were recorded in Albemarle Township in the Owen Sound District, in the central Minden District and in the northeast corner of the Brockville District. New infestations were also reported in Scots pine Christmas tree plantations in Manvers Township, and in white pine plantations in Balsam Lake Provincial Park in the Lindsay District.

Ambermarked Birch Leafminer, *Profenusa thomsoni* Konow

Heavy infestations caused severe defoliation of white birch in an 870 km^2 area southeast of Lake St. Joseph in the Sioux Lookout District, Northwestern Region. Small, scattered pockets of heavy infestation totalling about 10 km^2 were mapped at a number of other widely separated locations in the Red Lake and Sioux Lookout districts. Two small, heavy infestations with a combined area of about 3 ha were reported from Cheepay Island and Albany Forks on the Albany River in the Moosonee District, Northern Region. Ground checks at a number of locations revealed defoliation in the 90-100% range.

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex

In the Chapleau, Kirkland Lake and Temagami districts, increased populations caused heavy defoliation of open-grown and fringe jack pine at numerous locations. Reports of damage ranging from light to moderate were also received from the Timmins, Gogama, Sudbury, Espanola, Fort Frances, Atikokan and Blind River districts.

Eastern Pineshoot Borer, *Eucosma gloriola* Heinr.

This insect was reported from a number of areas throughout the province. Although high numbers of lateral shoots were frequently attacked, leader damage was usually less than 10%. Exceptions to this trend occurred in the Northern Region where a number of plantations in the Kirkland Lake, Timmins, Temagami and Chapleau districts had leader damage ranging from 12% to 19%. Other locations where significant leader damage occurred were: Patton Township, Blind River District (19%), McMeekin Township, Kenora District (23%) and MacFie Township, Dryden District (12%).

Redhumped Oakworm, *Symmerista canicosta* Francl.

This usually rare insect was recorded in infestation proportions in three districts in 1981. Red oak suffered moderate-to-severe defoliation on about 7 100 ha in the Thirty Thousand Islands in Georgian Bay between Parry Sound and Pointe au Baril in the Parry Sound District, Algonquin Region. High populations were also recorded in the Pinery Provincial Park and Grand Bend areas of the Chatham District and on open-grown and ornamental oaks near Bayfield in the Aylmer District, Southwestern Region, with a total of about 2 500 ha affected in these areas. The insect's primary hosts are white and bur oak but it will sometimes feed on other oaks as well as sugar maple, beech, basswood, birch and elm. Outbreaks are not usually of long duration.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* Roh.

Further to information included in the summer Survey Bulletin, a number of areas of moderate-to-severe defoliation were reported in the Fort Frances, Dryden and Sioux Lookout districts, Northwestern Region. In a large plantation in Britton Township, Dryden District, where previous defoliation had caused light mortality, a spray operation using malathion achieved good control of current populations. In the North Central Region, medium-to-heavy infestations were reported from a number of locations in the Thunder Bay, Geraldton and Terrace Bay districts. Moderate-to-severe damage was also recorded in several areas in the Timmins, Chapleau and Kirkland Lake districts in the Northern Region. Single pockets of medium-to-heavy infestation occurred in Cardiff Township, Algonquin Region and in North Monaghan Township, Central Region. Elsewhere, populations were generally low and defoliation was of little consequence.

Larch Sawfly, *Pristiphora erichsonii* Htg.

Populations remained low in northern Ontario except for several small areas in the Geraldton and Fort Frances districts where native larch was moderately to severely defoliated. A single, heavy infestation also occurred in the Terrace Bay District where mortality of 10 m trees reached 60% in a 1 ha stand. In southern Ontario populations

remained high in the Central and Southwestern regions where numerous European larch plantations and some native larch stands were severely defoliated.

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

Populations increased throughout much of northern Ontario for the second consecutive year. Heavy infestations resulting in conspicuous browning of foliage were reported from numerous areas in the Blind River District, Northeastern Region, in the Thunder Bay, Nipigon and Atikokan districts, North Central Region, and in the entire Northwestern Region. Numbers were generally lower in the Northern Region with the exception of the Hearst area in Hearst District and the Smooth Rock Falls-Cochrane area of Kapuskasing and Cochrane districts where numerous small areas of trembling aspen reproduction were heavily attacked. Populations in the Geraldton District, North Central Region declined to very low levels.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Populations of this pest remained low in the Eastern Region and most of the Algonquin Region where virus control programs over the past several years have proved generally successful. In contrast, populations in the Bracebridge District, Algonquin Region, and the Huronia District, Central Region increased, with medium and heavy infestations reported on planted red pine at numerous locations. In the Northeastern Region numbers were generally low except for a few small pockets of moderate infestation in North Bay District and two heavy infestations on planted red pine in Rose Township, Blind River District. In the latter case, one of the plantations suffered 33% mortality of 1 m trees over an area of about 3 ha.

Walnut Caterpillar, *Datana integerrima* G. & R.

A general increase in populations of this pest was evident in southern Ontario. Numerous medium and heavy infestations were reported from the Chatham, Aylmer and Simcoe districts, Southwestern Region, the Cambridge, Niagara, Maple and Lindsay districts, Central Region and the Napanee District, Eastern Region. In these areas open-grown ornamental and plantation walnut trees, along with occasional elm, hickory and butternut were severely defoliated. Defoliation in many cases was complete.

Maple Leafcutter, *Paraclemensia acerifoliella* (Fitch)

Reports of this insect were relatively rare in Ontario until last year when heavy infestations occurred in a 15 ha woodlot in Nassagaweya Township in the Cambridge District, Central Region and in maple woodlots in a 20 km^2 area of Bedford Township in the Napanee District, Eastern Region. In 1981 the infestation in the Central Region

remained unchanged; however, those in the Eastern Region expanded to encompass the majority of maple stands in a 1 300 km^2 area of Bedford and Loughborough townships, Napanee District and South Burgess and Bastard townships of the adjoining Brockville District. In most of this area defoliation exceeded 75%. Light infestations were also reported along the Trent Canal in Harvey Township, Algonquin Region.

Fall Webworm, *Hyphantria cunea* Dru.

Increased numbers of unsightly feeding nests were evident throughout southern Ontario. Heavy infestations were reported from numerous locations in the Simcoe, Aylmer and Chatham districts, Southwestern Region, and from the Cambridge-Brantford area of Cambridge District, the Whitby-Port Hope area of Lindsay District and numerous locations in the Niagara District, Central Region. Marked increases in numbers were also reported from the Carleton Place, Tweed and Cornwall districts, Eastern Region.

In northern Ontario, heavy infestations occurred in Tehkummah Township on Manitoulin Island in the Espanola District and single, light infestations occurred in the Kenora, Sioux Lookout and Thunder Bay districts.

Mountain Ash Sawfly, *Pristiphora geniculata* (Htg.)

The range of this introduced pest now includes most of Ontario except for the extreme northern and northwestern areas. In 1981 its range was again extended with the finding of larvae in Pyramid Township, northwest of Thunder Bay, Thunder Bay District, west of the town of Atikokan, Atikokan District and in the town of Fort Frances, Fort Frances District. Typical defoliation was observed on Moose Factory Island in the Moosonee District. Within the insect's established range, population levels were generally higher than in previous years with the most severe damage reported in Rainbow Falls Provincial Park and along the north shore of Lake Superior between Terrace Bay and Nipigon in the Terrace Bay and Nipigon districts.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Populations of this skeletonizer, which began increasing last year, reached outbreak proportions in 1981 (Fig. 2). Medium-to-heavy infestations caused severe browning of birch foliage over large areas of the Northern Region (28 000 km^2), the Northeastern Region (24 800 km^2), the North Central Region (3 000 km^2) and the Northwestern Region (1 800 km^2). Small, scattered pockets of heavy infestation were also reported from the Bruce Peninsula of the Owen Sound District, Southwestern Region, including Flowerpot Island in the Georgian Bay Islands National Park. In the Chapleau District, Northern Region, the birch skeletonizer, in conjunction with the spearmarked black moth (Fig. 3), caused up to 100% defoliation of host trees. Populations in the remainder of the province were generally low.

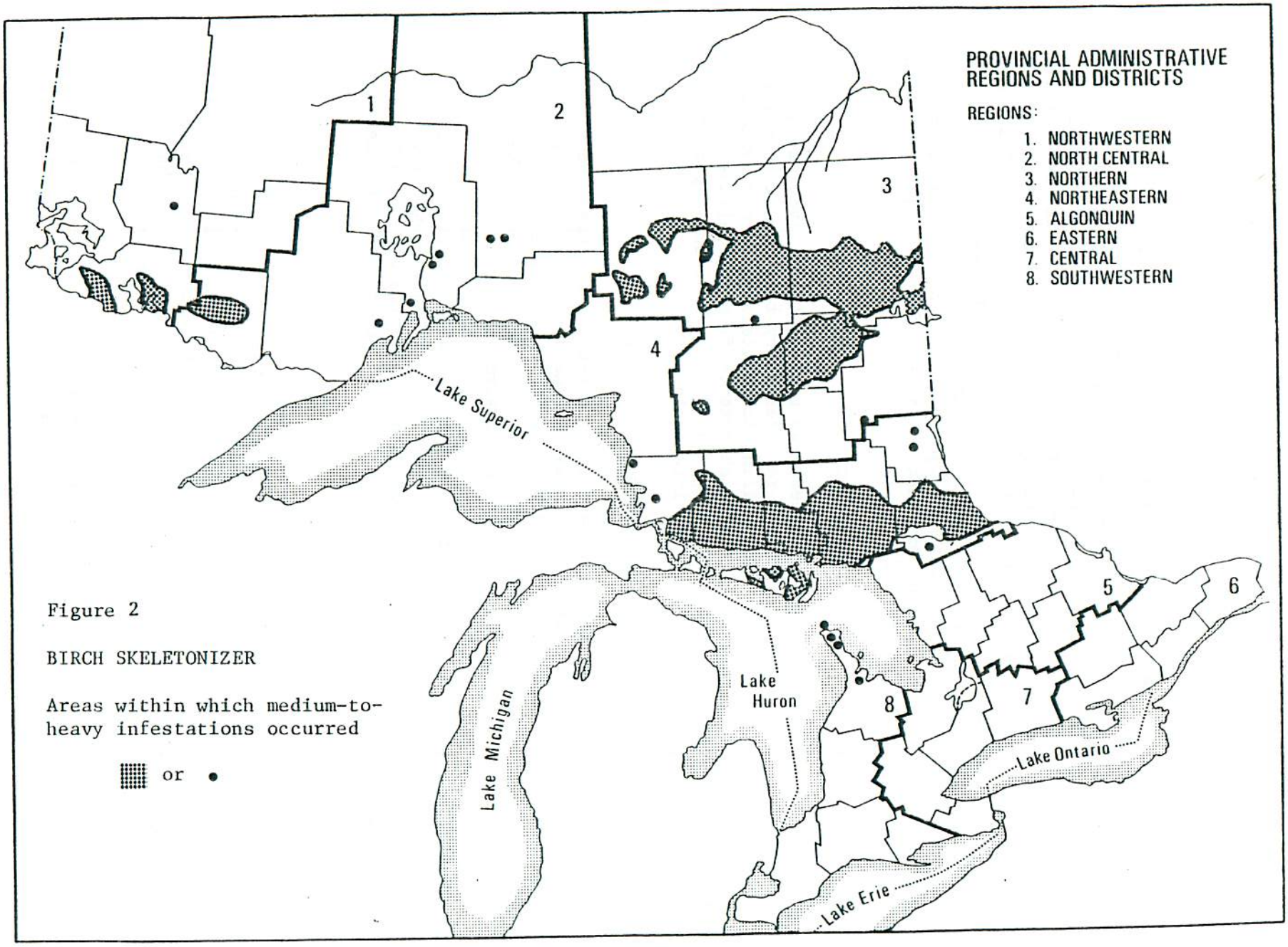

Figure 2

BIRCH SKELETONIZER

Areas within which medium-to-heavy infestations occurred

or

Spearmarked Black Moth, *Rheumaptera hastata* Linn.

The large moth flights of this insect reported in the summer Survey Bulletin resulted in heavy infestations encompassing some 7 800 km^2 in the Chapleau District, Northern Region and the adjoining Wawa District, Northeastern Region (Fig. 3). Within this area, most white and yellow birch stands suffered moderate-to-severe damage, some of them being 100% defoliated. The main body of infestation also extended for short distances into the Gogama District in the east and the Blind River District in the south. Small pockets of heavy infestation totalling about 4 ha were reported from the Chain of Lakes Road in the Kapuskasing District and near Mikwam Lake in the Cochrane District. In the more severely damaged areas of the Chapleau District the insect fed in conjunction with the birch skeletonizer (Fig. 2).

Bronze Birch Borer, *Agrilus anxius* Gory

Aerial surveys in the northern Red Lake District revealed that the area within which white birch were infested by this insect increased to approximately 1 700 km^2. Top killing and mortality are now evident throughout the entire infestation which extends from the Cairns-Pikangikum lakes area eastward to Mamakwash Lake. A few scattered small pockets were also mapped south of the main infestation.

Swaine Jack Pine Sawfly, *Neodiprion swainei* Midd.

There was a further increase in infestations of this insect in 1981. The largest infestation encompasses some 4 660 ha in Willet, Roadhouse, Banks and Wallis townships in the Kirkland Lake and Temagami districts of the adjoining Northern and Northeastern regions. The smaller infestation in the Big Boot-Lady Evelyn Lake area increased to some 1 035 ha and now includes parts of Van Nostrand, Klock, Leo and Dane townships in the Temagami District. A third, smaller infestation of approximately 20 ha was mapped near Sunday Lake in James Township, Kirkland Lake District. Light-to-moderate defoliation of jack pine was evident at a number of other locations in the northern part of Temagami District.

Sawyer Beetles, *Monochamus* spp.

Damage to jack pine stands by adult sawyer beetle feeding declined appreciably this year. The overall area affected in the Northern, North Central and Northwestern regions was 74 ha in comparison with 200 ha in 1980. The total area within which tree mortality occurred was reduced from 135 to 18 ha. The most significant declines occurred in the North Central Region where 80 ha were damaged last year but no damage was observed this year.

An interesting phenomenon was observed in the Kenora District, Northwestern Region where huge numbers of jack pine trees were infested

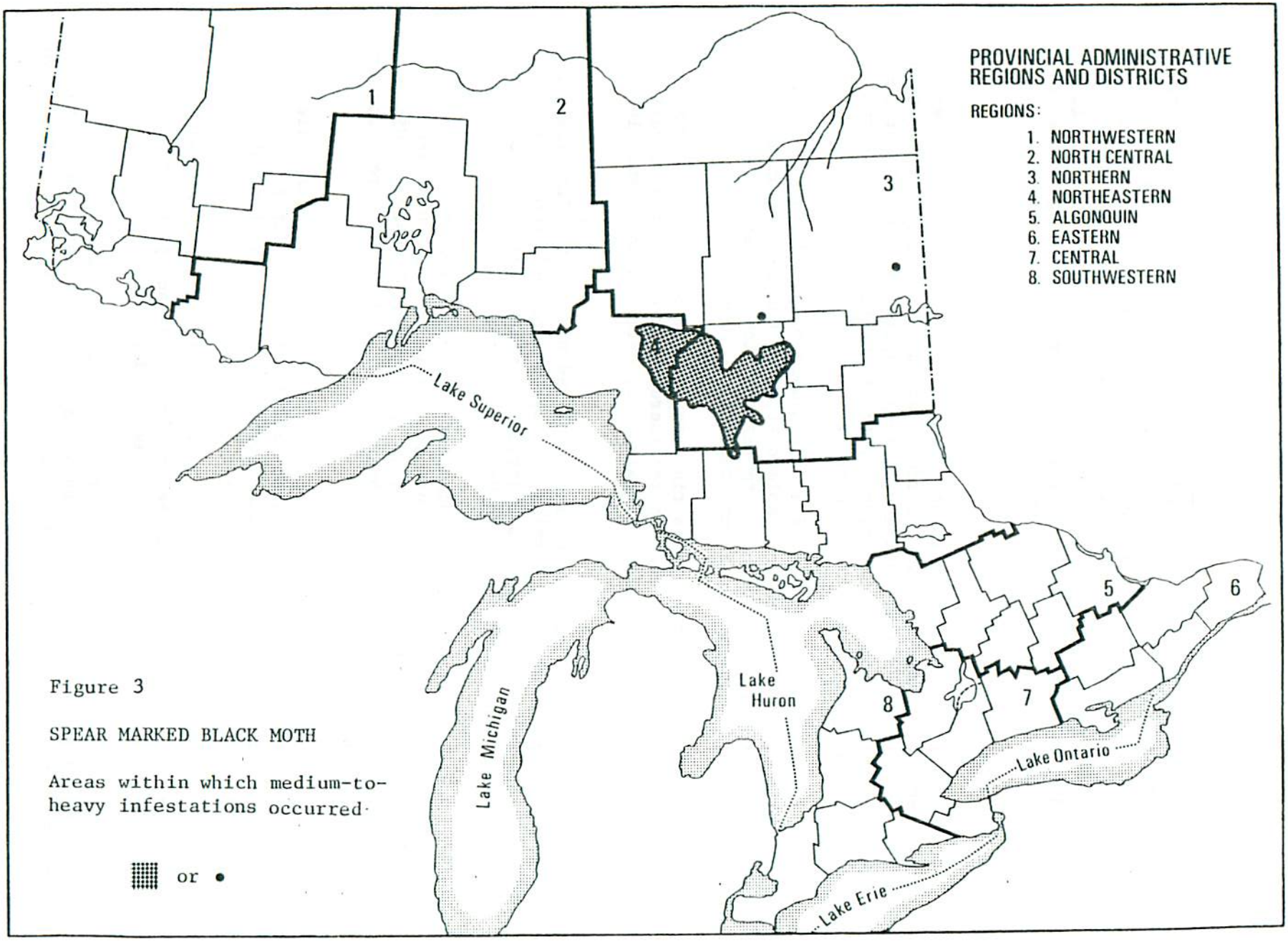

Figure 3

SPEAR MARKED BLACK MOTH

Areas within which medium-to-heavy infestations occurred

by sawyer beetles following the Kenora 23 fire in late May and early June, 1980. Examination of the area in early August 1981 revealed that large numbers of adult sawyer beetles had emerged from infested trees, an indication that the insect had completed its life cycle in some 14 months or less as opposed to the two years normally required. A similar situation was reported near Ten Mile Lake, Ignace District. At both locations, although feeding damage by newly emerged adults was apparent, no large areas of serious damage to residual trees were found.

Other Insects of Note

The cherry scallopshell moth, *Hydria prunivorata* Ferg., severely defoliated black cherry trees in hardwood stands at a number of locations in the Lindsay, Huronia and Maple districts, Central Region. Light damage was also reported from the Cambridge District, Central Region and the Owen Sound District, Southwestern Region.

Increased distribution of a pine needle midge, *Contarinia* sp., was reported in the Huronia and Maple districts, Central Region and in the Owen Sound District, Southwestern Region. Low populations were observed at numerous locations in the Bancroft District, Algonquin Region.

Populations of the greenstriped mapleworm, *Dryocampa rubicunda rubicunda* Fabr., which had been on the increase at a number of locations in the Northeastern Region for several years, declined to endemic levels in 1981.

Severe damage to the new shoots of red pine by the Zimmerman pine moth, *Dioryctria zimmermani* complex, was again reported from a number of locations in the central Huronia District. Similar damage was observed at a few locations in the northern Maple District.

Heavy infestations of an oak leaf mining sawfly, *Profenusa lucifex* Ross, caused conspicuous browning of oak foliage in a 1 500 ha area in Hamilton, Harvey and Cavan townships of the adjacent Lindsay and Minden districts. Light damage was also observed at the Midhurst Forest Station in the Huronia District.

The imported willow leaf beetle, *Plagiodera versicolora* Laich, caused severe damage to hybrid poplar foliage at the G. Howard Ferguson Forest Station, Kemptville District. Control attempts with malathion and cygon produced inconclusive results.

Increased populations of the pitch nodule moth, *Petrova albicapitana* (Busck), caused varying degrees of damage to jack pine reproduction at a number of locations in the Northwestern Region.

A general increase in numbers of the yellownecked caterpillar, *Datana ministra* Dru., was evident this year. The highest populations reported were in the Napanee and Carleton Place districts, Eastern Region

where open-grown deciduous trees at a number of locations were heavily defoliated. Reports of increased populations were also received from the Parry Sound, Lindsay, Simcoe, Fort Frances, Dryden, Temagami, Kirkland Lake and Timmins districts.

The red pine cone beetle, *Conophthorus resinosae* Hopk., damaged approximately 40% of the cones in an 8 ha red pine seed production area in Head Township, Algonquin Park District. Heavy infestations caused conspicuous twig damage at numerous locations in the northern Temagami District.

Low populations of the saddled prominent, *Heterocampa guttivita* Wlk., were reported from scattered locations in the Owen Sound, Chatham, Huronia and Bracebridge districts.

Balsam poplar stands supported medium-to-high populations of the poplar flea beetle, *Altica populi* Brown, in several districts of the Algonquin and Central regions.

TREE DISEASES

Ink Spot of Aspen, *Ciborinia whetzelii* (Seaver) Seaver

This disease was reported commonly from the northern and central parts of the province. Although infection levels were often in the 70-100% range, actual foliage damage was usually less than 10%. Exceptions to this trend occurred in South Algona Township, Pembroke District where 100% of the trees suffered 20% foliar damage and in Dana Township, North Bay District where 18% of the trees suffered 30% foliar damage.

Leaf Anthracnose of Maple, *Kabatiella apocrypta* (Ell. & Ev.) Arx

An overall decline in the intensity of this leaf disease was evident this year. In the Central Region, where damage levels have been high for a number of years, infections were reduced to the moderate level at several locations in the Huronia, Maple and Cambridge districts. Moderate foliar damage also occurred at one location in the Owen Sound District, Southwestern Region. Elsewhere, foliar damage was in the trace-to-light range.

Needle Casts of Pine, *Lophodermium* spp.

This group of needle cast fungi was reported at varying infection levels in the Northern, Northeastern and Algonquin regions. In North Bay District, 100% of the trees in a 2 ha red pine plantation in South Himsworth Township and a 2 ha jack pine plantation in Boulter Township suffered foliar damage of 70% and 95%, respectively. In a small red pine plantation in Monteagle Township, Algonquin Region 40% of the trees suffered 20% foliar damage. Elsewhere, infections were generally trace to light, with foliar damage less than 10%.

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

These very similar rust diseases of black and white spruce were reported from the four northern regions in 1981. The most severe damage occurred along the Flanders Road in Atikokan District, North Central Region where, in numerous small patches of 4 m black spruce, 70% of the trees suffered 40% damage. High infection levels were also found at a number of locations in the Wawa District, Northeastern Region, although actual foliar damage was usually low. Elsewhere, foliar damage ranged from trace to light.

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

In the Northwestern Region, infections intensified in the Fort Frances-Rainy River area where the disease was first detected in 1977. High infections are also present in Lake of the Woods Provincial Park, although the disease could not be found in the town of Kenora where it was reported for the first time last year.

In the Algonquin Region and the Lindsay District, Central Region, where the disease has been present for many years, examination of elm reproduction in a number of areas showed infection levels ranging from 19% to 70%.

Horse Chestnut Leaf Blotch, *Phyllosticta sphaeropsoidea* Ell. & Ev.

A marked decline in infection levels was reported from the Southwestern Region, particularly in the Simcoe District. A similar decline occurred in the Niagara District of the Central Region although heavy infections persisted on ornamental trees along the Niagara Parkway in the Niagara Falls and Queenston Heights areas. Heavy infections persisted in the Maple, Huronia and Cambridge districts, Central Region. The disease was common at low levels in the southern part of the Lindsay District, Central Region and in Cramahe Township in the Napanee District, Eastern Region.

Leaf and Twig Blight of Aspen, *Venturia macularis* (Fr.) E. Muell. & Arx

The most severe damage observed this year occurred along the Halfway Road about 50 km south of Geraldton, Geraldton District where 50% of the trees in a 10 ha stand were severely damaged. In the Sioux Lookout District, 25% of the trees in a 600 ha stand along the Vermilion River were severely damaged and similar damage levels were recorded in a small stand near Goodie Lake. Although reports of the disease were widespread in the remainder of the province, infection levels were generally low and damage was of little consequence.

Maple Problems

This condition, which was reported in the summer Survey Bulletin, continued to cause widespread damage to roadside, ornamental and open-grown trees, particularly in the Eastern Region. The highest current incidence was recorded in the towns of Perth and Smiths Falls where 75% of ornamental maple trees were affected. Higher than usual damage was reported on ornamental maple in the town of Pembroke in Pembroke District, Algonquin Region, where 54% of the trees examined were affected to some degree. In the Northeastern Region, maple deterioration continued to plague property owners in the city of North Bay where damage to ornamentals has been extensive this year. Aerial surveys detected several large patches of mortality in mature sugar maple stands on Cockburn Island in the Espanola District, but it was not possible to ground check the areas to determine the cause.

Storm Damage

A severe storm, accompanied by wind and hail, caused extensive foliar and moderate twig and branch damage to approximately 900 ha of trembling aspen and sugar maple in Guilford, Harburn, Dysart and Dudley townships in the Minden District, Algonquin Region. A similar storm caused extensive breakage and foliar damage to a 30 ha overmature sugar bush near Thornhill in the Maple District. Lightning damage, probably the result of a storm in the summer of 1980, caused numerous patches of mortality in red pine plantations in the northern Huronia District. Because of root grafting, the effect of each strike was multiplied, with an average of 45 trees being killed, although as many as 80 dead trees were observed at some locations.

Drought

Drought conditions caused extensive browning and premature shedding of deciduous foliage, primarily white birch, in a number of areas in the North Central and Northwestern regions. The situation on birch was further complicated by heavy infestations of the birch skeletonizer in some areas. Generally, trees growing on dry, rocky sites suffered the most damage.

Other Diseases of Note

Heavy infections of a leaf rust, *Melampsora medusae* Theum., were found on some hybrid poplar clones in the G. Howard Ferguson Forest Station in the Brockville District.

Heavy infections of walnut leaf spot, *Marssonina juglandis* (Lib.) Magn., caused premature defoliation of planted walnut and occasional butternut in the Central Region. The disease was also reported to be widespread on butternut in the Eastern Region.

A poplar leaf disease, *Septoria populicola* Pk., caused premature defoliation of balsam poplar in several areas of the Maple, Huronia and Cambridge districts, Central Region and in the Owen Sound District, Algonquin Region. Heavy infections were also reported on balsam poplar and to a lesser extent on butternut over extensive areas of the Eastern Region.

Diplodia tip blight, *Diplodia pinea* (Desm.) Kickx, again caused serious damage to older Scots pine plantations in the Central Region.

An ash leaf rust, *Puccinia sparganioides* Ell. & Barth., was collected for the first time in Ontario on white ash in Essa Township, Huronia District.

Cylindrocladium root rot, *Cylindrocladium floridanum* Sob. & Seymour, caused 10% mortality of transplanted red pine in one compartment at the G. Howard Ferguson Forest Station, Brockville.

Additional reports of rodent damage were received from the Kirkland Lake District, where jack pine plantations in McElroy, Skead, and Cane townships had 15%, 66% and 55% mortality, respectively. Trees at these locations ranged from 1.5 to 2.5 m in height and the sizes of plantations affected were 10, 30 and 40 ha, respectively.

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