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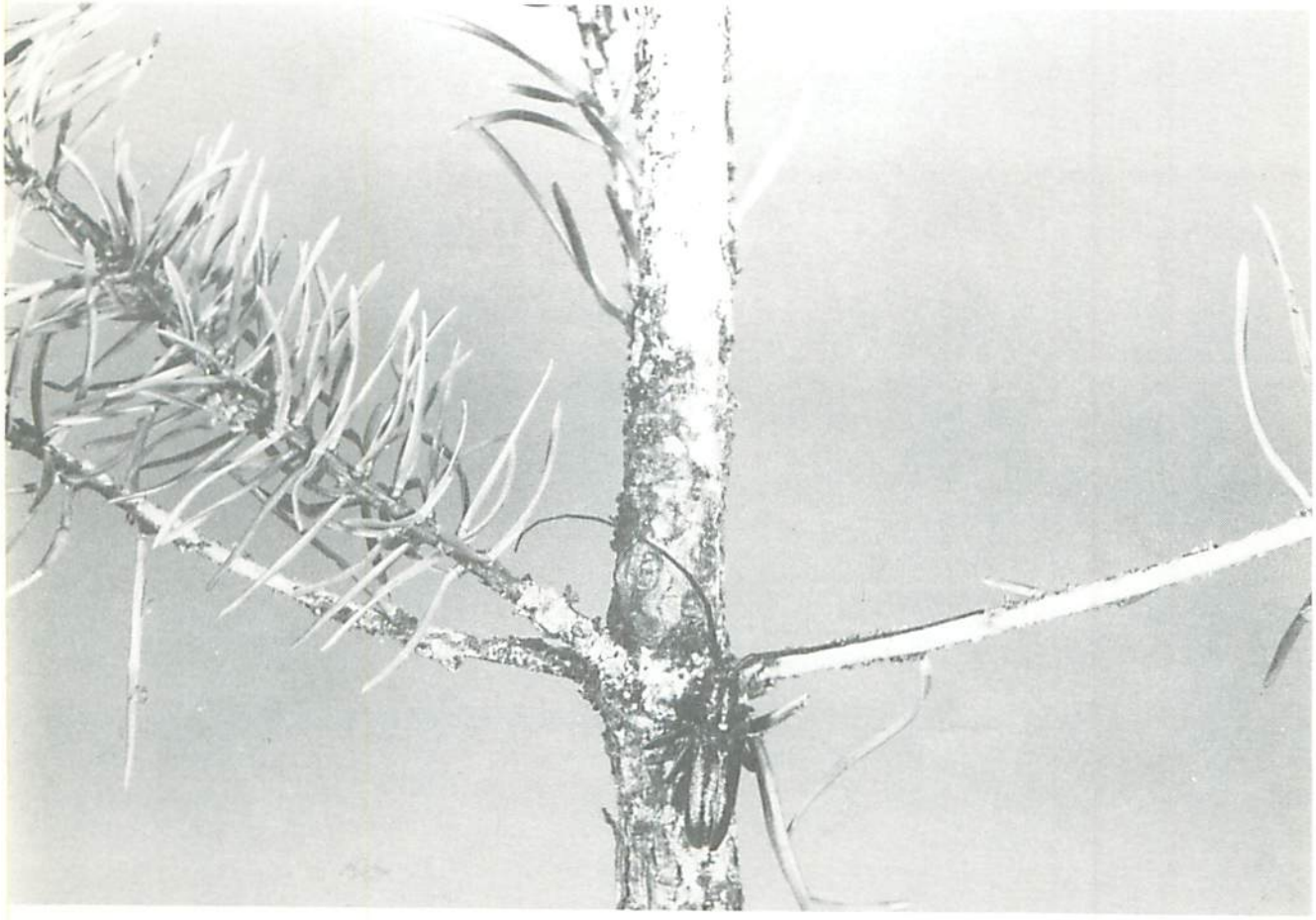
Forest Insect and Disease Conditions in Ontario

Summer 1978



Feeding damage on stems and branches of jack pine attributed to the adults of the white spotted sawyer beetle, *Monochamus scutellatus* (Say).

GREAT LAKES FOREST RESEARCH CENTRE
Box 490 • Sault Ste. Marie Ontario

FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO

Summer 1978

This bulletin, the second of three to be issued in 1978, describes insect and disease conditions for the period May 15 to July 15. It is based mainly on collections and reports received from Survey personnel.

GREMMENIELLA WORKSHOP HELD AT GREAT LAKES FOREST RESEARCH CENTRE

The European race of *Gremmeniella abietina* (Lagerb.) Morelet and its threat to Ontario forests was the subject of a workshop hosted by the Forest Insect and Disease Survey Unit (FIDS) of the Great Lakes Forest Research Centre on 1 June. The workshop was held to brief Ontario Ministry of Natural Resources foresters on this disease threat which exists just south of our border in New York. Dr. C.E. Dorworth discussed the symptoms and other disease characters of both the North American race, which has been seriously affecting northern Ontario pines since the 1950s, and the European race, which appears to be adapted to more southerly climates. The discussion then turned to the detection survey planned by FIDS and to the action that would be taken if the disease were discovered in Ontario. Also covered were the United States and Canadian quarantines administered by the respective Departments of Agriculture. Many of the symptoms are the same for the diseases caused by both races of the fungus, and the group was able to get firsthand impressions of symptomatology from a visit to red pine and jack pine plantations in the Searchmont area, where the North American race has been present for about 10 years.

Personnel attending from the Ontario Ministry of Natural Resources (OMNR) were E.F. Johnston (London), R.N. Staley and Ed Borczon (Richmond Hill), Bruce McGauley, J.D. Griffiths and Si-Dae Kim (Maple), Jim Donaldson (Napanee), Al Corlett (Lanark), Dave Chapeskie (Brockville), Alec J. Denys (Tweed), Bob Pinnell and Bob Beecher (Lindsay), D.A. Scott (Simcoe), Al Mathews and Ray M. Gilbert (Cambridge) and Mike Innes (Midhurst).

FOREST INSECTS

Spruce Budworm *Choristoneura fumiferana* (Clem.)

Many major changes were evident in the spruce budworm situation in Ontario following the completion of aerial and ground surveys in July (Figure 1). On a province-wide basis, the total area infested increased by some 1 068 346 ha (2,639,881 acres) over last year. A total area of 15 156 488 ha (37,451,680 acres) of moderate-to-severe defoliation was mapped in 1978 compared to a total of 14 088 142 ha (34,811,799 acres) in 1977. On a regional basis, infestations declined throughout southern Ontario, a modest increase was recorded in northwestern Ontario, and a large increase was recorded in northeastern Ontario.

In southern Ontario, the gross area affected has declined from 407 932 ha (1,008,000 acres) in 1977 to approximately 24 282 ha (60,000 acres) in 1978. With the exception of increases in populations and defoliation in the northern part of the Parry Sound and Bracebridge districts, the budworm outbreak has virtually collapsed in southern Ontario. Approximately 100 pockets of defoliation ranging in size from 2-4 ha (5-10 acres) to 80-120 ha (200-300 acres) remain scattered throughout southern Ontario. Most of these pockets of defoliation are located in the Algonquin Region, although infestations are present in all regions of southern Ontario.

Northeastern Ontario experienced a resurgence of budworm infestations in some districts that resulted in an increase of 1 321 312 ha (3,264,960 acres) on an overall basis. A total of 14 789 543 ha (36,544,960 acres) of moderate-to-severe defoliation was mapped in 1978 compared to 13 468 231 ha (33.28 million acres) in 1977. In the Northern Region, particularly in Hearst, Kapuskasing and Cochrane districts, infestations spread some 65 km (40 miles) to the north into Moosonee District along the Missinaibi and Mattagami rivers. There were comsiderable increases in the area affected in the eastern part of the Northeastern Region, particularly in North Bay, Sudbury and Espanola districts. By way of contrast, most of the Sault Ste. Marie District was largely free of noticeable defoliation as were parts of the Wawa, Blind River and Chapleau districts. Frost damage to balsam fir and white spruce as a result of low temperatures in early June was recorded in Wawa, Chapleau, Hearst and Kapuskasing districts. The infestation centred on Clavett Township along the Pagwa River in Geraldton District increased considerably in size and other increases were recorded in several other infestations in the Terrace Bay and White River districts. Spraying operations, aerial and ground, were carried out in early June to protect high-value areas in Wawa, Chapleau, Kirkland Lake and Kapuskasing districts. *Bacillus thuringiensis*, Matacil and Orthene were the materials used. The total area treated was 728 ha (1,800 acres). Many new instances of tree mortality were mapped in northeastern Ontario. White spruce tree mortality was reported in several cases, but ground checks must be carried out before further details can be reported.

In northwestern Ontario, an increase of some 130 684 ha (322,921 acres) of moderate-to-severe defoliation was mapped in Fort Frances, Atikokan and Thunder Bay districts. The infested area totalled 342 633 ha (846,720 acres) in 1978 compared to 211 979 ha (523,799 acres) in 1977. In Fort Frances District, in the infestation west of Bennett Lake, larval populations apparently increased considerably and resulted in very heavy back feeding on balsam fir. Heavy frosts which occurred for three consecutive nights in early June (June 8, 9, 10) resulted in considerable foliage damage to balsam fir and white spruce in low lying areas but apparently had no effect on budworm larval populations. Elsewhere, numbers remained very low along the Ontario-Manitoba border in Kenora District where it was suspected last year that populations were increasing. In Thunder Bay District, larval populations decreased in many areas that were considered heavily infested last year or were expected to be heavily infested this year. However, little change occurred in the main body of the infestation extending from Shebandowan Lake to Kawnipi Lake in Quetico Provincial Park in Atikokan District.

Province-wide egg-mass surveys designed to detect changes and provide infestation forecasts for 1979 are currently under way. Results of the survey will be summarized in the fall issue of the Survey Bulletin.

Forest Tent Caterpillar *Malacosoma disstria* Hbn.

Populations of this pest decreased considerably throughout southern Ontario, whereas in most of the northern portion of the province populations remained high and an increase in areas infested was reported in some instances (Figure 2). A total of 122 200 km^2 (47,000 sq. miles) was moderately to severely defoliated in 1977; in 1978 this figure rose to 178 700 km^2 (69,000 sq. miles). Neither figure includes defoliated areas north of the 13th base line in northwestern Ontario.

In the four regions of southern Ontario an overall reduction in population occurred and infestations have been more or less reduced to small scattered pockets of light-to-moderate and heavy defoliation. In the Southwestern and Central regions, pockets of moderate-to-heavy defoliation of hardwoods were recorded in the northern portion of the Owen Sound and Huronia districts. Two small pockets of moderate-to-heavy foliage damage in each of the Tweed, Lanark and Cornwall districts of the Eastern Region were recorded and in the Algonquin Region scattered pockets of moderate-to-heavy defoliation were mapped in the Parry Sound, Bracebridge and Minden districts. Elsewhere defoliation was either very light or nonexistent.

Although populations were relatively high in the Sudbury and North Bay districts in the Northeastern Region the main body of the infestation is now reduced to three large pockets covering several townships in each district. A few smaller pockets were also recorded in the North Bay District. Moderate-to-severe defoliation was recorded in essentially the same area in the Espanola District, including Manitoulin Island. In the Temagami District severe defoliation recurred in aspen stands in Lorrain Township south of Cobalt and expanded into the northeast part of South Lorrain Township. A small band of light defoliation was present along the west side of the infestation. Elsewhere in the region populations were low and scattered.

In the Northern Region moderate-to-heavy defoliation recurred within essentially the same area as in 1977, approximately 28 490 km^2 (11,000 sq. miles) in the Hearst, Kapuskasing, Cochrane and Moosonee districts. The southern boundary of the infestation extended slightly into the upper northeast corner of the Timmins District. However, a reduction in the area defoliated in previous years occurred in the northeast portion of the Cochrane District and the southwest portion of the Moosonee District. In the North Central Region populations increased for the fourth consecutive year in the Thunder Bay and Atikokan districts. Severe defoliation recurred in the area west of Thunder Bay as well as in and around the town of Atikokan and west along both sides of Highway 11 to Price Lake. Several small pockets of severe defoliation were also recorded around Beaver House Lake and northwest of Clearwater West Lake to the district boundary. A small pocket of severe defoliation persisted in the southeast corner of Boyce Township in the Geraldton District.

In the Northwestern Region, south of the 13th base line, severe defoliation continued and infestations expanded to the south and east, within an area of approximately 145 039 km^2 (56,000 sq. miles). This is a considerable increase over 1977, when the infested area was 59 570 km^2 (23,000 sq. miles). The 1978 infestation extends along the Ontario-Manitoba border from Rainy River in the Fort Frances District north to the 13th base line and then eastward well into the Sioux Lookout District, and covers virtually all of the Dryden and Kenora districts and approximately half of the Ignace District. Several new pockets were also reported in the Fort Frances District. North of the 13th base line an area of approximately 15 540 km^2 (6,000 sq. miles) was heavily defoliated (not shown on map). A considerable build-up in populations of the parasite *Sarcophaga aldrichi* Park was reported in a number of areas throughout the province. Aerial spraying operations using *Bacillus thuringiensis* to protect foliage and reduce populations were carried out by OMNR at three provincial parks (Grundy Lake in the Parry Sound District, Mikisew in the Bracebridge District, Six Mile Lake in the Huronia District) and at the Frost Centre in the Minden District. In addition, Agreement Forests in Owen Sound District were sprayed by OMNR.

Birch Leafminer *Fenusa pusilla* (Lep.)

Severe damage to white birch foliage occurred in several locations through the Southwestern Region and a substantial increase in populations in the Central Region caused heavy damage in a number of areas. In the Eastern Region populations declined to low levels. In the Algonquin, Pembroke and Bancroft districts damage ranged from light to severe. Severe browning of foliage was recorded at several locations in the Kirkland Lake District of the Northern Region; reports of light damage were also received from the Chapleau and Cochrane districts. Moderate populations occurred along the Ranger Lake Road, Sault Ste. Marie District.

In the North Central Region high populations recurred on ornamentals in the city of Thunder Bay and surrounding areas to the west of the city.

Oak Leaf Shredder *Croesia semipurpurana* (Kft.)

Regions reporting on this pest of oak show that an overall decline in populations has occurred.

In the Central Region populations declined to light except for a few pockets of heavy infestation in the townships of Tiny, Vespra, Tosorontio and Nottawasaga in the Huronia District and a pocket of moderate infestation in Haldimand Township, Lindsay District. In the Eastern and Algonquin regions defoliation was generally light and widely scattered. Low populations prevailed throughout the Sault Ste. Marie, Blind River and Espanola districts in the Northeastern Region. Considerable mortality of red oak has been reported in the Blind River District as a result of repeated defoliation. Reports of oak mortality have also been received from a number of locations in the Central Region. Areas treated with Orthene in 1978 were the Dufferin County Forest, the Wildman Tract in the Simcoe County Forest and the Midhurst Forest Station.

American Aspen Beetle *Gonioctena americana* (Schaef.)

Generally populations of this pest of young aspen were light; however, several districts have reported conspicuous damage.

In the Northern Region moderate-to-severe defoliation was reported at a number of locations through the Chapleau and Gogama districts. A recurrence of moderate-to-severe defoliation was noted at many points in the central and western parts of the Kirkland Lake District. Defoliation ranging from moderate to severe was recorded at several locations in the Blind River and Sault Ste. Marie districts in the Northeastern Region. Populations were low throughout the North Central Region with the most noticeable defoliation occurring north of Dorion in the Thunder Bay District. Increased populations caused moderate-to-severe defoliation in parts of the Bracebridge and Parry Sound districts.

Aspen leafroller *Pseudexentera oregonana* (Wlshm.)

Infestations of this pest on aspen persisted in northwestern Ontario, especially in the Fort Frances District where defoliation ranged from moderate to severe in an area of approximately 3 626 km^2 (1,400 sq. miles). A number of areas of light defoliation were also reported in other parts of the Fort Frances and Kenora districts. Populations have gradually declined in the Thunder Bay District of the North Central Region since 1975 and the area of severe defoliation has been reduced from approximately 2 849 km^2 (1,100 sq. miles) to 36 km^2 (14 sq. miles). However, light populations were still present in a number of areas. Severe defoliation occurred in the Atikokan District west of Price Lake to the Seine River.

A further decline occurred in the intensity of infestations in the Kirkland Lake and Timmins districts in the Northern Region, although moderate infestations persisted in the southeastern part of the Kirkland Lake District. Elsewhere defoliation was light. Light populations were reported at single locations in each of the Algonquin and Central regions.

Bruce Spanworm *Operophtera bruceata* (Hlst.)

In the Nipigon District in the North Central Region infestations on aspen declined considerably. Damage was generally light except for around the town of Beardmore and south to Kilkenny Township where moderate-to-heavy infestation was recorded.

Fruit Tree Leafroller *Archips argyrospilus* (Wlkr.)

The heavy infestations by this pest on hardwoods experienced in 1977 in the Chapleau and Gogama districts have virtually disappeared and only very light populations remain. Elsewhere in the Northern Region intensity of infestation declined appreciably in the Kirkland Lake and Timmins districts, although light-to-moderate defoliation was general throughout these districts with a few small pockets of severe defoliation noted in the Kirkland Lake District. High populations were recorded at single locations in each of the Sault Ste. Marie and Wawa districts in the Northeastern Region. Scattered light populations occurred through the Thunder Bay and Atikokan districts in the North Central Region.

Webspinning Sawfly *Cephalcia* spp.

Heavy infestations recurred in Scots pine plantations in Oro Township, and moderate populations were observed in Mono Township. Moderate populations were also found on pine in Floss Township, Huronia District. Lighter populations were recorded on jack pine and Scots pine at several other locations in the Central Region. In the Bancroft District of the Algonquin Region, heavy infestations persisted in a red pine plantation in Burleigh Township.

A collection of adults submitted from the Central Region has been identified as the pine false webworm *Acantholyda erythrocephala* (Linn.), an introduced species first recorded in Pennsylvania in 1925 and reported only three times previously in Canada.

Cedar Leafminer *Argyresthia thuiella* Pack., *A. canadensis* Free., *A. aureoargentella* Brower and *Pulicalvaria thujaella* Kft.

A general increase in populations was reported throughout the Bruce Peninsula and caused moderate-to-severe browning of the foliage of eastern white cedar at a number of locations. In the southern half of the Southwestern Region populations were mainly light. Conspicuous discoloration was quite evident in small woodlots and ornamentals throughout the Huronia District in the Central Region. Light populations were noted throughout the Eastern Region and the eastern half of the Algonquin Region.

Jack Pine Budworm *Choristoneura pinus pinus* Free.

In southern Ontario light infestations persisted on planted Scots pine in Glenelg Township, Owen Sound District, and in Oro Township, Huronia District. Low populations were also noted at single locations in the Cambridge and Maple districts and in a red pine plantation in Lindsay District. A few larvae were collected west of Thunder Bay.

A Sawfly on Black Locust *Nematus* sp.

High populations of this sawfly completely defoliated a 4 ha (10 acre) plantation of black locust in East Camden Township in Napanee District of the Eastern Region. Light infestations were also recorded in the adjacent area.

Jack Pine Sawfly *Neodiprion pratti paradoxicus* Ross

Although population levels were higher and more widespread than in 1977 in the Eastern Region, overall defoliation was still classed as light except in Lanark and Tweed districts, where scattered moderate feeding damage occurred. In the Algonquin Region moderate-to-severe defoliation was recorded in jack pine stands in Blair and Mowat Townships in the Parry Sound District and was light to moderate in North Algona and Buchanan townships in the Pembroke District.

European Pine Sawfly *Neodiprion sertifer* Geoff.

The status of this pest remains essentially the same as in 1977. Population levels remain relatively low throughout southern Ontario, although larval colonies were reported to be more common on Scots pine and red pine in parts of the Eastern Region and in the Bracebridge District of the Algonquin Region. A general distribution similar to that of last year occurred throughout the city of Sault Ste. Marie.

Monochamus scutellatus (Say)

High populations and notable damage caused by the adult of this species were reported in several areas in 1978 (see front page). In the Northern Region heavy damage to mature jack pine trees adjacent to cutover areas occurred in Invergarry Township, Gogama District and in Chappise Township, Chapleau District. This condition was also noted at several locations in the Kapuskasing and Cochrane districts. In the North Central Region conspicuous damage was reported south of Kopoka Lake in the Nipigon District and in drought areas in the Thunder Bay District; in some instances dead tops and branches were noted.

A leafroller on Manitoba Maple *Archips negundana* Dyar

A moderate infestation of this species was present throughout the town of Fort Frances, and in the city of Sault Ste. Marie moderate-to-high populations were reported.

Hemlock Looper *Lambdina fiscellaria fiscellaria* (Guen.)

Tree mortality, probably caused by this pest, was reported to have occurred in overmature hemlock stands in Burleigh and Anstruther townships in the Bancroft District, Algonquin Region.

TREE DISEASES

Although surveys for many tree diseases are not completed, information received thus far on disease conditions is provided herein.

Extensive surveys were carried out through southern Ontario to determine the presence of the European race of Gremmeniella canker of pine, *Gremmeniella abietina* (Lagerb.) Morelet. At this date all surveys have proved negative.

Ciborinia whetzelii (Seaver) Seaver, ink spot of aspen, was reported from a number of areas in the northern part of the province, although in most instances it occurred at only trace to light levels. It was widely distributed through the Northeastern Region and was thought to be more common than in 1977 in the more northern regions. Small pockets of infection at trace levels occurred in the eastern half of the Algonquin Region.

Leaf and twig blight of aspen, *Venturia macularis* (Fr.) Mueller & Arx appears to be more prevalent in the North Central Region in 1978, where foliar damage was classed as light at a few locations. Damage, however, was concentrated on tree terminals and over 85% of the terminals were killed at these locations.

Melampsora medusae Thuem., a needle rust of larch, was widely distributed through the Sault Ste. Marie District at trace damage levels.

Davisomycella ampla (J.J. Davis) Darker, a needle cast of jack pine, occurred at trace levels of infection through the Algonquin and Pembroke districts in the Algonquin Region; in the Thunder Bay and Atikokan districts in the North Central Region; and at one location in the Blind River District, Northeastern Region.

Lophodermium pinastri (Schrad. ex Hook.) Chev., a needle cast of pine, was commonly found at light levels of infection on red pine through the Pembroke, Algonquin and Bancroft districts of the Algonquin Region. A severe infection was reported in a red pine plantation south of Prichard Lake, Dryden District.

Cytospora chrysosperma (Pers.) F., a canker found on hybrid poplar, was reported at damaging levels on stems and branches in plantations in the Brockville and Cornwall districts in the Eastern Region.

Diplodia blight, *Diplodia pinea* (Desm.) Kickx, caused heavy damage in a Scots pine plantation in Medonte Township, Huronia District, Central Region in 1977. In addition, in 1978 considerable damage occurred at several other locations in the above district as well as in the Maple and Cambridge districts. Scots pine and Austrian pine were both infected. Light damage was reported on Scots pine in the Ottawa and Cornwall districts in the Eastern Region.

Two new infection centres of the shoot blight *Sirococcus strobilinus* Preuss on red pine were reported in the Northwestern Region, one in the Kenora District and the second in the Dryden District, mainly at trace levels of infection.

Maple Decline

Studies are still under way in the Owen Sound District in sugar maple stands where trees were first noted dying in 1976. Although mortality has not increased greatly in previously affected stands, additional stands within the area are showing typical deterioration. In the Huronia District this condition is present in several townships. The most severe damage occurred in a large maple stand south of Highway 400 in Medonte Township where mortality was heavy. Sparse and partly dead crowns are commonplace. Considerable mortality of sugar maple has been reported in the southern parts of the Parry Sound and Bracebridge districts. Pockets of mortality ranging from 50 to 80% occurred within an estimated 4 000 ha (20,000 acres) near Moon River south of Parry Sound. Scattered dead trees were also noted over a large area within the Muskoka Lakes region. High populations of the forest tent caterpillar caused severe defoliation in these areas for several years prior to 1978.

Oak Decline

A series of plots was established in southern Ontario in 1977 to follow the progress of crown deterioration in red oak stands for a period of five years.

A report from the Central Region shows that mortality in the plots examined ranges from 1 to 7%. In addition to this, aerial surveys were carried out over a large area and pockets of mortality were mapped at a number of locations in the Huronia District, including several locations on Beausoleil Island in Georgian Bay Islands National Park. Pockets of mortality were also evident in Uxbridge Township, Maple District.

Frost Damage

For the second consecutive year frost damage caused some concern in a number of districts. The most conspicuous damage was reported in the North Central and Northern regions where balsam fir and white spruce were heavily damaged in several districts, when low temperatures occurred in the first two weeks of June. Moderate-to-heavy damage was observed in the Pembroke District in the Algonquin Region. Although damage was less severe than in 1977 in the Chapleau District, it was noted that in some instances the same trees were affected in both years.

Winter Drying

This condition was present in a number of regions in 1978 and affected such conifers as Scots pine, red pine, jack pine and white pine. It would appear that the most severe conditions were experienced in the Central and Southwestern regions where particularly heavy damage was recorded. Light damage was common in parts of the Eastern Region and moderate-to-severe foliage damage occurred in a number of locations in the Kirkland Lake District, Northern Region.

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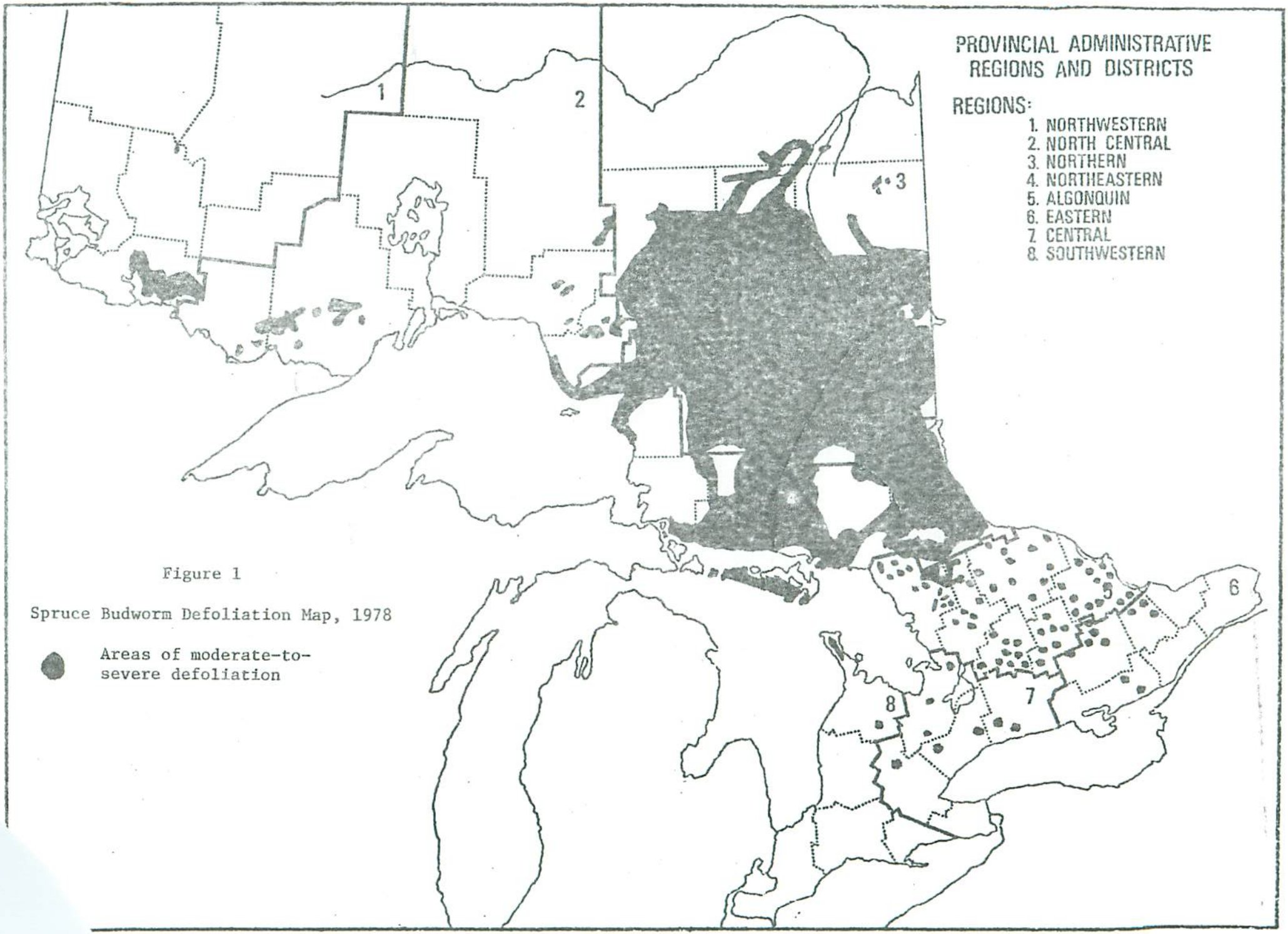

Figure 1

Spruce Budworm Defoliation Map, 1978

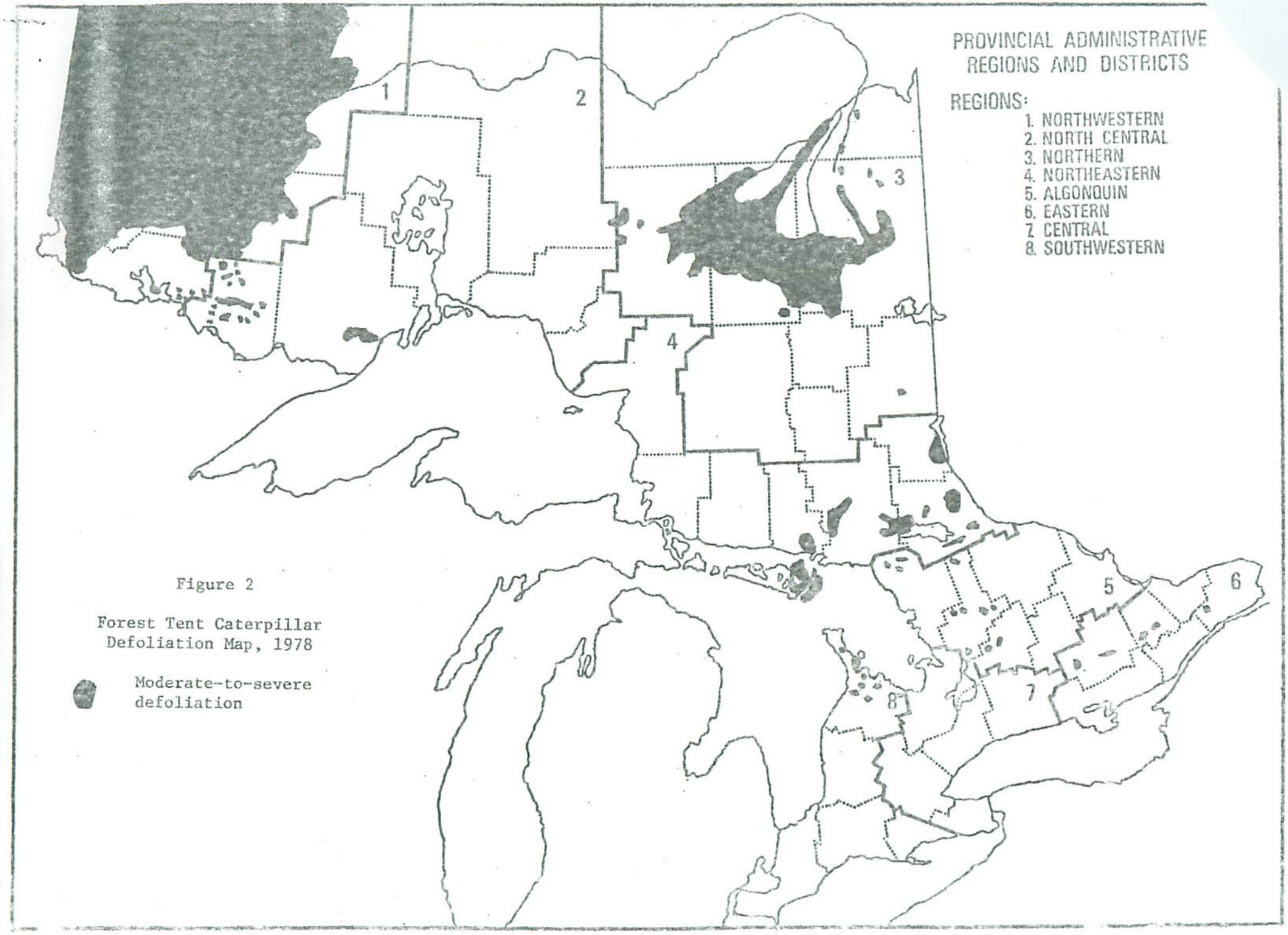

Figure 2

Forest Tent Caterpillar
Defoliation Map, 1978