FOREST INSECT AND DISEASE SURVEYS IN THE NORTH CENTRAL REGION OF ONTARIO, 1975

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The excellent cooperation received from the Ontario Ministry of Natural Resources and the forest industry in carrying out pest surveys in 1975 is greatly appreciated.

Frontispiece. Severe damage to a jack pine tree caused by the western gall rust, *Endocronartium harknessii* (J. P. Moore) Y. Hiratsuka

SURVEY HIGHLIGHTS

As in the past several years, the threat of a spruce budworm infestation was the most pressing insect problem in 1975. Budworm populations edged upwards throughout the Region and in the White River District several pockets of new heavy infestation were mapped in the Pukaskwa area. The entire spruce budworm situation in Ontario including 1976 forecasts is described in a separate report (Report O-X-250). Other insects which caused more damage than in 1974 were the larch sawfly, the spruce shootworms and the yellowheaded spruce sawfly. Large aspen tortrix and forest tent caterpillar infestations declined in the Geraldton and Nipigon districts whereas a small pocket of heavy forest tent caterpillar infestation appeared in the town of Atikokan.

A special survey on the occurrence of sweetfern blister rust was carried out at 14 randomly selected locations and the results were analyzed in relation to the distribution of the two alternate hosts, sweetfern, *Comptoniae peregrina* (L.) Coult., and sweet gale, *Myrica gale* L. Other important diseases in the Region were needle rusts of spruce, Scleroderris canker of pine and a shoot blight of red pine. Drought conditions in 1974 and 1975 caused some tree mortality on poor sites in southwest Atikokan District.

H. R. Foster

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INSECTS

Blackheaded Budworm, *Acleris variana* Fern.

Light infestations persisted on balsam fir (*Abies balsamea* [L.] Mill.) trees in Ledger Township, Nipigon District and on white spruce (*Picea glauca* [Moench] Voss) at Mile 2 on the Pagwachuan River Road, Geraldton District. Infestations on balsam at Klotz Lake and in Hambleton Township were reduced in intensity over 1974. Light infestations on black spruce (*Picea mariana* [Mill.] B.S.P.) at Smoothwater and Grayson lakes in Nipigon District declined to trace levels. Small numbers of larvae were observed in conjunction with spruce budworm surveys at numerous other widely separated locations.

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

Widespread infestations noted in 1973 declined in 1974 and again in 1975. A heavy infestation in a 70-sq.-mile (180-km^2) area south of Armstrong in 1974 collapsed in 1975. Medium-to-heavy defoliation recurred in an area of about 400 sq. miles (1036 km^2) south of Long Lake between the Steel and Auguasabon rivers in the Terrace Bay District. Smaller areas of moderate damage were observed in the Jellicoe and Onaman Lake areas of the Nipigon District, and in sporadic pockets for about 20 miles (32 km) northwest of White River.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of damage surveys, population sampling, and egg-mass counts have been included with those of other survey regions in a special report by G. M. Howse et al. (Report O-X-250). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1975 and gives infestation forecasts for the province in 1976.

Cone Insects on White Spruce

Moderate-to-severe damage to white spruce cones was recorded in the White River and Terrace Bay districts (Table 1). In the White River District cones and seeds were so heavily infested in Cecile Township and in the Kenshoe Lake area that field crews collecting cones were forced to move to more suitable collecting areas.

Birch Leafminer, *Fenusa pusilla* (Lep.)

No appreciable change in the distribution of this introduced insect could be determined. However, infestations intensified in parts of Terrace Bay, White River and Nipigon districts, recently invaded by the pest. Severe browning of white birch (*Betula papyrifera* Marsh.) foliage recurred at several locations in the southern portions of the

Thunder Bay District and along the Beaverhouse Lake Road in the Atikokan District. Low populations were observed on small trees at numerous other locations.

Table 1. Insects responsible for damage to white spruce cones in two districts in 1975.

Location	Avg DBH of sample trees (in.)[a]	Degree of injury	Cone insects identified
White River District			
Cecile Twp	6	heavy	*Mayetiola carpophaga* (Tripp) - a midge *Laspeyresia youngana* Kft. - spruce seed moth *Megastigus piceae piceae* Roh. - a seed chalcid
Terrace Bay District	4	moderate	*Dasineura rachiphaga* Tripp - a midge *Mayetiola carpophaga* (Tripp) - a midge *Hylemya planipalpis* Stein - a cone maggot

[a] 1 in. = 2.54 cm

American Poplar Leaf Beetle, *Gonioctena americana* (Schaef.)

This insect which has caused negligible damage on trembling aspen (*Populus tremuloides* Michx.) for long periods prior to 1973 has increased in numbers over the past 3 years. In 1975 population levels were medium in the Lucy and Twin lake areas and light in Bain and O'Meara townships in the Geraldton District. Other light populations were observed near Manitouwadge in Terrace Bay District and south of Regan to Lurch Lake in White River District.

Balsam Poplar Blotch Miner, *Lithocolletis nipigon* Free.

For the fourth consecutive year high populations of this insect on balsam poplar (*Populus balsamifera* L.) were recorded at Kakabeka Falls, Pigeon River and in Blake Township, Thunder Bay District. New heavy infestations were located at French Lake and near the town of Atikokan in the Atikokan District, and along the Poshkokagan River in the Nipigon District. Light infestations were observed at many other points in the Region.

Aspen Blotch Miner, *Lithocolletis ontario* Free.

Increased populations of this insect caused conspicuous browning of trembling aspen foliage at many locations. The most conspicuous damage was observed along the Beaverhouse Lake Road and between Nydia and Eva lakes in the Atikokan District; in Paipoonge Township, along the Hogarth Lake Road and near Hay Lake in the Thunder Bay District; and in the Geraldton, Longlac and Nakina areas of the Geraldton District. The browning caused by this pest resembles that caused by drought, and separation of the two types of damage, which often occurred simultaneously, was difficult.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Forecasts of extensive defoliation for 1975 did not materialize owing to the failure of eggs to hatch throughout most of the Jellicoe and Onaman River infestations. Both infestations collapsed (Table 2). In the Pagwachuan River area near the eastern border of the Geraldton District, despite a poor hatch, infestations continued to be severe over about 30 sq. miles (77.7 km^2), but were generally reduced to medium intensity in the area extending southeast from Pagwachuan Station to Eureka Lake and the heavy infestation in the adjoining Hearst District. A small infestation in nearby Bell Township was reduced to medium intensity although its boundaries were extended a few miles northeast into Henderson Township.

The only infestation of consequence west of Lake Nipigon occurred in the town of Atikokan where a variety of ornamental and park trees were stripped. Surveys failed to locate the source of this new infestation and it is speculated that a moth flight was attracted by the light of the town in 1974. Elsewhere in the Region larvae and occasional colonies were observed. Heavy infestations are forecast for 1976 in the Pagwachuan River area (Table 3).

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)

Population levels of this insect increased appreciably in a few areas west of Lake Nipigon but showed little change east of the lake. In the Atikokan District, damage increased to heavy intensity on open-grown and fringe trees at Nym Lake airbase, in the French Lake Provincial Park, and in plantations north of Quetico Centre. Heavy infestations were also evident on ornamental spruce trees in the city of Thunder Bay and in the town of Nipigon, but were less prevalent in the municipalities of Geraldton, Longlac, Caramat and Terrace Bay. Light infestations occurred at many additional points in the Region.

Table 2. Summary of unhatched forest tent caterpillar egg bands and degrees of infestation in two districts in 1974 and 1975 (Counts were based on the examination of 25 bands at each location.)

Location	No. of egg bands with no hatch	No. of egg bands with partial hatch	Degree of infestation[a] 1974	Degree of infestation[a] 1975
Nipigon District				
Walter Twp	25	0	H	N
Leduc	25	0	H	N
McComber Twp	25	0	H	N
Mile 6, Onaman River Road	23	2	H	N
Geraldton District				
Pagwachuan River Rd	17	8	H	L
Eureka Lake	5	20	H	M

[a] H = heavy, M = medium, L = light and N = nil

Table 3. Summary of forest tent caterpillar egg-band counts in two districts in 1974 and 1975 and infestation forecasts for 1976 (based on counts of all egg bands on each tree)

Location (Twp)	Avg DBH of trees (in.)[a]	No. of trees sampled in 1975	Avg no. of egg bands per tree 1974	Avg no. of egg bands per tree 1975	Infestation forecast for 1976[b]
Nipigon District					
Walters	8	3	111	0	N
Leduc	7	3	57	0	N
Geraldton District					
Ashmore	5	3	0	0	N
Clavet	7	1	93	53	H
Boyce	7	1	-	43	H

[a] 1 in. = 2.54 cm

[b] N = nil, H = heavy

White Pine Weevil, *Pissodes strobi* (Peck)

The overall incidence of weevil damage decreased (Table 4). A single heavy infestation persisted on black spruce trees along Highway 17 in Trewartha Township, Thunder Bay District. Moderate damage was observed on planted trees in Conmee and Marks townships, Thunder Bay District, along the Spruce River Road in the Nipigon District, and in O'Meara Township in the Geraldton District. Elsewhere in the Region damage levels were low.

Table 4. Summary of damage by the white pine weevil in two districts in 1974 and 1975 (Counts were based on the examination of 100 trees at each location.)

Location	Tree species	Avg DBH of sample trees (in.)[a]	Trees weeviled 1974 (%)	Trees weeviled 1975 (%)
Thunder Bay District				
Marks Lake Road	rP	2	6	5
Marks Lake Road	jP	2	12	5
Conmee Twp	wS	3	18	12
Marks Twp	nS	3	19	16
Trewartha Twp	bS	1	39	23
Nipigon District				
Kopka Lake	jP	2	0	1

[a] 1 in. = 2.54 cm

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Populations of this defoliator increased across the Region for the second consecutive year. Aerial surveys revealed medium-to-heavy infestations south of Zephira Lake in the Atikokan District, at numerous locations in the Thunder Bay and White River districts, and at four widely separated locations in the Nipigon District. Medium-to-heavy infestations were also recorded in Pic Township, Terrace Bay District and north of Nakina and in the O'Sullivan Lake area of the Geraldton District (see Appendix, Fig. A1). Infestations of lesser intensity were observed at many other points.

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

The status of this insect remained virtually unchanged. In the Thunder Bay District, heavy infestations persisted south and east of Kakabeka Falls, north of Pigeon River, and in the city of Thunder Bay. In the White River District, particularly heavy defoliation of mountain ash (*Sorbes americana* Marsh.) was observed on ridges in the western section of the Pukaskwa National Park. Generally defoliation was moderate in the southeastern section of the Terrace Bay District and trace to light at many locations in the Region.

Army Worm, *Pseudaletia unipuncta* Haw.

The most widespread and damaging outbreak of the army worm in recent years occurred in the eastern half of the Region, prompting many extension calls. Cutworm damage in general but mainly by the army worm was severe on lawns, shrubs and garden crops, particularly in Geraldton, Longlac, Beardmore, Nakina and Thunder Bay. Various types of cutworm control methods were used.

Aspen Leaf Roller, *Pseudexentera oregonana* Wlshm.

Heavy infestations of this leaf roller occurred over an area of approximately 1100 sq. miles (2700 km^2) adjacent to and west of Thunder Bay (see Appendix, Fig. A2). Trembling aspen stands within the infested area suffered from 40% to 100% defoliation prompting numerous inquiries from the public and concerned forestry officials. Although the aspen leaf roller was the main species involved, substantial numbers of *Phyllocolpa* sp. and *Sciaphila duplex* Wlshm. were collected in the Nolalu-Stanley areas of the Thunder Bay District.

Spruce Shootworms, *Zeiraphera canadensis* Mut. & Free., *Z. destitutana* (Walker) and *Z. fortunana* Kft.

A general population increase was evident in the Thunder Bay District for the second consecutive year. Heavy infestations recurred on black spruce and white spruce windbreaks in the Thunder Bay Forest Station, and along the Heavon Lake road. Continued high populations on ornamentals in the city of Thunder Bay again prompted numerous inquiries from concerned homeowners. Infestations increased from moderate to heavy on scattered white spruce trees on Sibley Peninsula, along Highway 593, near Pigeon River, and east of Kakabeka Falls. Medium infestations occurred north of Cameron Falls, Nipigon District, and along Highway 11, east of the Seine River in the Atikokan District. Smaller numbers of larvae were observed at numerous other locations.

Table 5. Other forest insects

Insect	Hosts(s)	Remarks
Archips cerasivoranus (Fitch)	ecCh	observed at a few locations in Geraldton and Terrace Bay districts
Arge pectoralis (Leach)	wB	A light infestation at Pegwachuan Lake in 1974 collapsed in 1975.
Argyresthia laricella Kft.	tL	a few larvae near Auden, Nipigon District, but difficult to find in the Region
Bucculatrix canadensisella Cham.	wB	Almost a complete collapse has occurred at most locations in the Region.
Chrysomela mainensis mainensis Bech.	Al	collected in Ledger Twp, Nipigon District
Clepsis persicana Fitch	bF	occasional larvae in mat samples
Coleophora laricella Hbn.	tL	collected in Ledger Twp and in the Thunder Bay area; scarce in the Region
Dimorphopteryx melanognathis Roh.	wB	observed rarely in White River, Terrace Bay and Geraldton districts; small numbers at Black Sturgeon Lake in Nipigon District
Dioryctria reniculelloides Mut. & Mun.	wS	common on mat samples throughout the Region
Diprion hercyniae (Htg.)	wS	a few larvae on mat samples in Nipigon, Geraldton, Terrace Bay and Thunder Bay districts
Eucosma gloriola Heinr.	jP, muP, rP	light on ornamentals and planted trees at Thunder Bay Forest Station, and at one location in Atikokan District

Table 5. Other forest insects (continued)

Insect	Hosts(s)	Remarks
Hylobius warreni Wood	jP	a new heavy infestation on jack pine (*Pinus banksiana* Lamb.) in Trewartha Twp, Thunder Bay District; light in O'Meara Twp, Geraldton District, and at Sturgeon River in Nipigon District
Hyphantria cunea Dru.	many deciduous hosts	heavy on white elm (*Ulmus americana* L.) in the Slate River Valley and common elsewhere in Thunder Bay area; rarely observed east of Lake Nipigon
Limenitis arthemis Dru.	Apple	more common than usual, prompting extension calls in Thunder Bay District
Malacosoma californicum pluviale Dyar	pCh, W	light in Domtar limits east of Orient Bay, Nipigon District, and along the Trans-Canada Pipe Line in Geraldton District
Mindarus abietinus Koch.	bF	light balsam twig aphid infections in Hunt Twp, White River District
Nematus sp. #25	tA	heavy on small reproduction at Black Sturgeon Lake, Thunder Bay District
Neodiprion abietis complex	bF, wS	light at a few points between Marathon and White River, in Clavet Twp, Geraldton District, and at several locations in the Thunder Bay and Atikokan districts
Neodiprion pratti banksianae Roh.	jP	a few colonies in Ashmore Twp, Geraldton District but scarce in the Region
Neodiprion nanulus nanulus Schedl	jP	scattered colonies in Thunder Bay Nursery

Table 5. Other forest insects (continued)

Insect	Hosts(s)	Remarks
Neodiprion virginianus complex	jP	medium at French Lake, Atikokan District, light at Black Sturgeon Lake, Nipigon District, and scattered colonies along the Hydro Road south of Regan in White River District
Nycteola cinereana N. & D.	bPo	medium on small trees at Kakabeka Falls Provincial Park, Thunder Bay District
Pachysyphinx modesta Harr.	Light trap	collected commonly at French Lake, Atikokan District
Petrova albicapitana (Busck.)	jP, lP	light on lodgepole pine, (*Pinus contorta* Dougl.) in O'Meara Twp, Geraldton District; common on jack pine in the Region
Phratura purpurea purpurea Brown	tA	collected in Ledger Twp, Nipigon District
Pikonema dimmockii (Cress.)	wS, bS	small numbers on mat samples at many locations in the Region
Platarctia parthenos (Harr.)	Light trap	collected frequently in light trap at French Lake in Atikokan District
Pleroneura brunneicornis Roh.	bF	light-to-severe damage at many points in the Region
Pristiphora lena Kinc.	wS	a few larvae in mat sample at David Lake in Geraldton District
Rhabdophaga swainei Felt	wS, bS	generally reduced to trace levels at many points in the Region

Table 5. Other forest insects (concluded)

Insect	Hosts(s)	Remarks
Rhyacionia adana Heinr.	jP	trace in plantations south of Longlac in Geraldton District
Trisetacus alborum Keifer	wP	severe shoot mortality at several locations on Sibley Peninsula and near Northern Light Lake, Thunder Bay District
Zeugophora spp.	bPo, tA, W	medium at Kakabeka Falls Park; light at many other locations in the Region

TREE DISEASES

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

White spruce showed high defoliation levels on open-grown and fringe trees at several points in Pic Township and west along Highway 17 to Jackfish Lake in the Terrace Bay District. Pockets of medium defoliation were observed near Frank Lake in Nipigon District, and at several points along the Manitouwadge Road and in the vicinity of Camp 15 in the Marathon Paper Company limits in Terrace Bay District. Light defoliation was observed at many additional locations and on planted trees near Sucker Creek and O'Meara Lake in Geraldton District.

Black spruce stands showed high defoliation levels north of Upsala and in the Great Lakes Paper Company plantations north of Shebandowan (Table 6). Infections east of Lake Nipigon were generally light.

Table 6. Summary of damage caused by needle rusts of spruce in two districts in 1975

Location (Twp)	Tree species	Avg DBH of sample trees (in.)[a]	Trees affected (%)	Defoliation level (%)
Geraldton District				
O'Meara	wS	2	100	22
Thunder Bay District				
Upsala	bS	9	100	29
Camp 511	bS	0.5	100	65

[a] 1 in. = 2.54 cm

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

Defoliation was generally reduced to the light level in 1975, in the Beardmore-Sturgeon River sector and north of Auden in the Nipigon District; in areas north of O'Sullivan Lake and northeast of Nakina in Geraldton District; in the Nama Creek and Hillsport areas in Terrace Bay District; and in the vicinity of Matthews Lake in White River District. Trace defoliation was observed at many other scattered locations.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

A special survey was carried out in 1975 to establish the status of this organism on a province-wide scale. Fourteen randomly selected stands were evaluated in the North Central Region and 79% of these had no infection present. Light canker damage was recorded in Magone Township in White River District and in the Hogarth and Burchell lake areas in Thunder Bay District (Table 7). In these instances it is felt that the alternate host was sweet gale (*Myrica gale* L.) which is usually found in moist situations. The low levels of damage in the Region no doubt are due to the absence of the principal alternate host, sweetfern, *Comptonia peregrina* (L.) Coult., throughout most of the Region except the western part of the Atikokan District.

Table 7. Summary of sweetfern blister rust in jack pine stands randomly selected in five districts in 1975

Location	Avg ht of sample trees (ft)[a]	Trees affected (%)	Trees severely damaged (%)
Terrace Bay District			
Pic Twp	14	0	0
White River District			
Twp 64	57	0	0
Mikano Twp	15	0	0
Shabotik Twp	15	0	0
Magone Twp	30	5	5
Geraldton District			
O'Sullivan Lake	67	0	0
Lapierre Twp	37	0	0
Caramat Road, Mile 5.1	41	0	0
Thunder Bay District			
Fraleigh Twp	59	0	0
Gorham Twp	23	0	0
Hogarth Twp	64	2.7	2.7
Muskeg Lake	55	0	0
Burchell Lake Road	50	6	6
Atikokan District			
Aramis Lake	57	0	0

[a] 1 ft = 30.48 cm

Western Gall Rust, *Endocronartium harknessii* (J. P. Moore) Y. Hiratsuka

The damage level and incidence of this rust on jack pine trees remained high in the Nezah area, but in the nearby Beardmore sector where some tree mortality was observed in 1974 the damage levels were light. High damage levels and light tree mortality were observed in young jack pine stands in Bain Township. Galls were common in many young stands in the Nipigon District, in Exton Township in Geraldton District and in Boy Scout plantations near Marathon in Terrace Bay District.

Scleroderris Canker of Pine, *Gremmeniella abietina* (Lagerb.) Morelet

Surveys were confined to disease situations detected this year in Terrace Bay and White River districts and to rechecks of damage in two young stands in which the disease had been previously reported (Table 8). Severe damage continued to occur on seeded and planted jack pine in Bain Township, Geraldton District, and in a plantation that had been replanted with tubelings in Nickle Township in Terrace Bay District. Surveys indicated that current infection and associated damage were greatly reduced over previous years. This applies to the Cosgrave Lake and Sandra Township areas of Nipigon District; to Kowkash and Rupert townships and the Caramat south areas of Geraldton District; in the Palmquist Lake, the Manitou Falls and the Hillsport-Manitouwadge road junction areas of Terrace Bay District; in the Graham area of Thunder Bay District; and in the Kenshoe Lake section of White River District. The decline is attributed to a combination of dry conditions in 1974 and 1975 and the fact that host trees have now surpassed the 5-ft (152.4-cm) height level above which branches are less susceptible to the disease. The Scleroderris situation in Bain and Nickle townships constitutes a threat to extensive plantings of jack pine, should future weather conditions be favorable to the development and spread of the disease.

Hypoxylon Canker of Poplar, *Hypoxylon mammatum* (Wahl.) J. H. Miller

Work on this disease was confined to establishing a better definition of its distribution in trembling aspen stands. The disease was common in poor growth sites and excessively moist or dry conditions in aspen stands in southern areas, but was less common and often scarce in second-growth stands north of a line from Beardmore to the Pagwachuan River Station.

Target Canker of Poplar, *Nectria* sp.

Damage levels were high in small areas near Melchett Lake in Geraldton District and at Flat Lake northeast of Armstrong in the Nipigon District (Fig. 1 and 2). As many as seven of the large, black, target-shaped cankers were present on some trees and 30% of the trees in some parts of the stands were affected. Damage by the disease was observed commonly in northern areas but was generally scarce or absent in the central and southern part of the Region.

Table 8. Summary of damage in stands with moderate and high levels of Scleroderris canker in three districts in 1975

Location (Twp)	Tree species	Trees affected (%)	Trees severely attacked (%)	Trees dead (%)	Estimate of area affected (acres)[a]
Geraldton District					
Bain	jP	70	40	20	3,000
Terrace Bay District					
Nickle	jP	80	35	10	1,500
Mile 11 Kimberly-Clark Road[b]	jP	25	20	5	1,500
White River District					
Welsh[b]	jP	50	20	5	800

[a] 1 acre = approx. 0.40 ha

[b] newly reported in 1975

A Rust on Balsam Fir, *Pucciniastrum epilobii* Otth

Pockets of medium defoliation occurred in the Hambleton Township area in White River District, and in second-growth balsam fir just east of Palmquist Lake, and in a stand south of Caramat in Terrace Bay District. A survey at Palmquist Lake indicated that all trees were infected, with an average of 26% of the needles damaged.

Single-tree Mortality of Balsam Fir

Scattered individual balsam fir trees continued to die and turn red in July or August. Generally about 3% of the balsam fir trees in many stands die each year as indicated by data for several study areas. The rate, assessed by aerial observation, seems to be much higher in many of the inaccessible stands. The cumulative mortality in spruce-fir stands in the vicinities of Slim Jim, Loughland and Meta lakes now appears quite similar to early stages of mortality caused by the spruce budworm.

Abiotic Damage

Drought

Severe drought conditions in 1974 and the lesser drought conditions that prevailed in 1975 were considered responsible for severe browning of eastern white cedar (*Thuja occidentalis* L.) over about 100 sq. miles (259 km^2) in the Van Nostrand-Riverview lakes sectors of the Atikokan District.

Fig. 1. Target canker of poplar, *Nectria* sp.

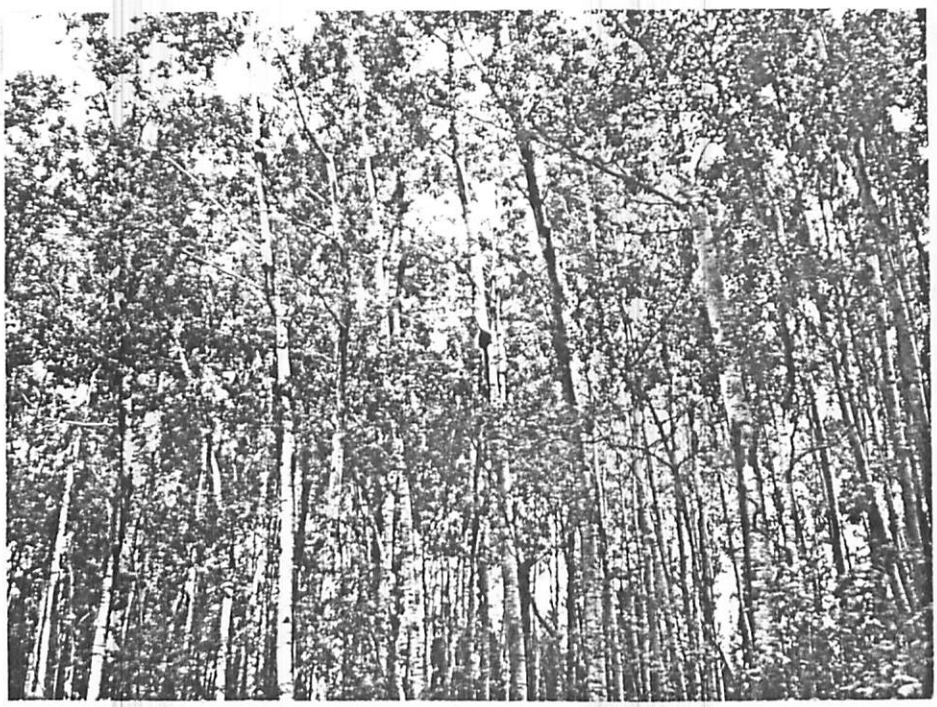


Fig. 2. Stand of aspen heavily infected with target canker

Small pockets of jack pine and red pine (*Pinus resinosa* Ait.) mortality were detected during aerial surveys at Clearwater and Portage bays, Sandpoint, David and Thomson lakes, and Wilkins Bay in Lac la Croix in the southwest corner of the Atikokan District. This mortality was confined to high rocky ridges which were severely affected by drought in the summer of 1974. This condition also seemed to be responsible for a variety of trends in the intensities of both insects and disease organisms.

Winter Drying

Winter drying caused moderate damage to red pine and lodgepole pine foliage in plantations in Terrace Bay and Geraldton districts (Table 9). Moderate-to-severe damage was observed on Scots pine (*Pinus sylvestris* L.) near Mokoman and Dorion and on red pine in Paipoonge Township, Thunder Bay District. The winter drying condition that affected extensive jack pine stands in the southern sectors of Thunder Bay and Atikokan district in 1973 and 1974 did not occur in 1975 and most stands are recovering.

Table 9. Summary of trees affected and amount of damage caused by winter drying in two districts in 1975

Location (Twp)	Tree species	Avg ht of trees (ft)[a]	Trees affected (%)	Foliar damage (%)
Terrace Bay District				
Pic	rP	8	100	65
78	rP	10	100	50
83	rP	10	100	35
Geraldton District				
O'Meara	lP	12	100	35
O'Meara	lP	4	100	70
O'Meara	rP	15	70	20

[a] 1 ft = 30.48 cm

Frost

Minor amounts of new shoot mortality of balsam fir and white spruce were recorded in low-lying areas in the Nakina area and in an extensive flat cut-over area of jack pine in Bain Township.

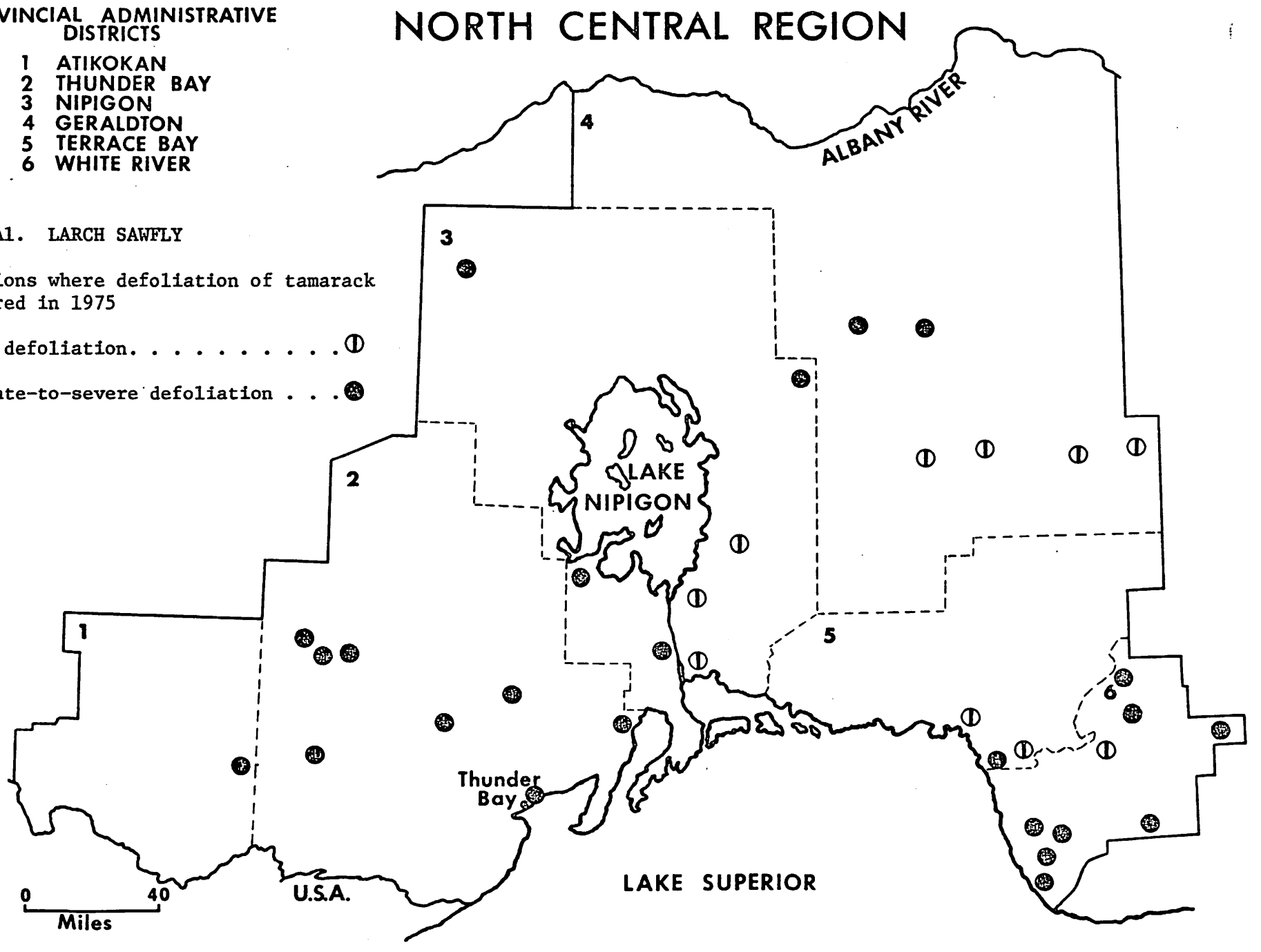
Table 10. Other forest diseases

Organism	Host(s)	Remarks
Apiosporina collinsii (Schw.) Hoehn. Witches' broom	Ser	trace damage at many points in the Region
Arceuthobium pusillum Pk. Dwarf mistletoe	jP	heavy damage near Lyn Lake in Geraldton District and south of Sparkling Lake in Thunder Bay District; lesser amounts at other scattered points in the Region
Armillaria mellea (Vahl ex Fr.) Kummer Armillaria root rot	jP	occasional tree mortality in several young stands in Geraldton, Nipigon and Thunder Bay districts
Chrysomyxa arctostaphyli Diet. Yellow witches' broom	bS	light damage near Pays Plat in Nipigon District and in Gorham Twp, Thunder Bay District; trace at several other points in the Region
Chrysomyxa pirolata Wint. Cone rust	sW	high damage in Laurie Twp and along Heavon Lake Road, Thunder Bay District and near French Lake in Atikokan District
Coleosporium asterum (Diet.) Syd. Needle rust	jP	light defoliation in Nickle Twp in Terrace Bay District
Cronartium coleosporioides Arth. Stalactiform rust	jP	active fruiting not observed
Cronartium comandrae Pk. Comandra rust	Jp	collected near Auden and Frank Lake in Nipigon District
Cronartium ribicola J. C. Fischer White pine blister rust	wP	heavy damage at several locations in Thunder Bay District and in Sandra Twp, Nipigon District; light at other widely separated locations in the Region

Table 10. Other forest diseases (concluded)

Organism	Host(s)	Remarks
Delphinella balsameae (Waterman) E. Muell. Needle cast	bF	light defoliation at Black Sturgeon Lake in Nipigon District
Lophodermium nitens Darker Needle cast	wP, rP	heavy defoliation near Pine Portage and light north of Gull River in Nipigon District
Melampsora medusae Thuem. Leaf rust	tL	collected in Ledger Twp in Nipigon District and at the south end of the Manitouwadge Road in Terrace Bay District
Melampsorella caryophyllacearum Schroet. Witches' broom	bF	widely scattered with no recent change in the Region
Pollaccia radiosa (Lib.) Bald. & Cif. Leaf and twig blight	tA	heavy damage east of Nydia Lake, Atikokan District; trace to light at numerous other points in the Region
Polyporus tomentosus Fr. Root and butt rot	tA	observed occasionally in the Region
Sarcotrochila piniperda (Rehm) Korf Snow blight	sW	medium damage on windbreak trees in the Thunder Bay Forest Station
Semi-mature tissue needle blight	wP	not collected in recent years
Sirococcus strobilinus Preuss Shoot blight	rP	no change in distribution; continued heavy damage in numerous stands in Atikokan and southwestern Thunder Bay Districts, but not collected in the Thunder Bay Forest Station as in previous years
Verticillium sp. Verticillium wilt	wE	collected during surveys for Dutch elm disease in the Thunder Bay area

APPENDIX


NORTH CENTRAL REGION
PROVINCIAL ADMINISTRATIVE DISTRICTS
1 ATIKOKAN
2 THUNDER BAY
3 NIPIGON
4 GERALDTON
5 TERRACE BAY
6 WHITE RIVER
Fig. A1. LARCH SAWFLY
Locations where defoliation of tamarack occurred in 1975
Light defoliation. . . . . .
Moderate-to-severe defoliation . . .
ALBANY RIVER
LAKE NIPIGON
Thunder Bay
LAKE SUPERIOR
U.S.A.
0 40
Miles

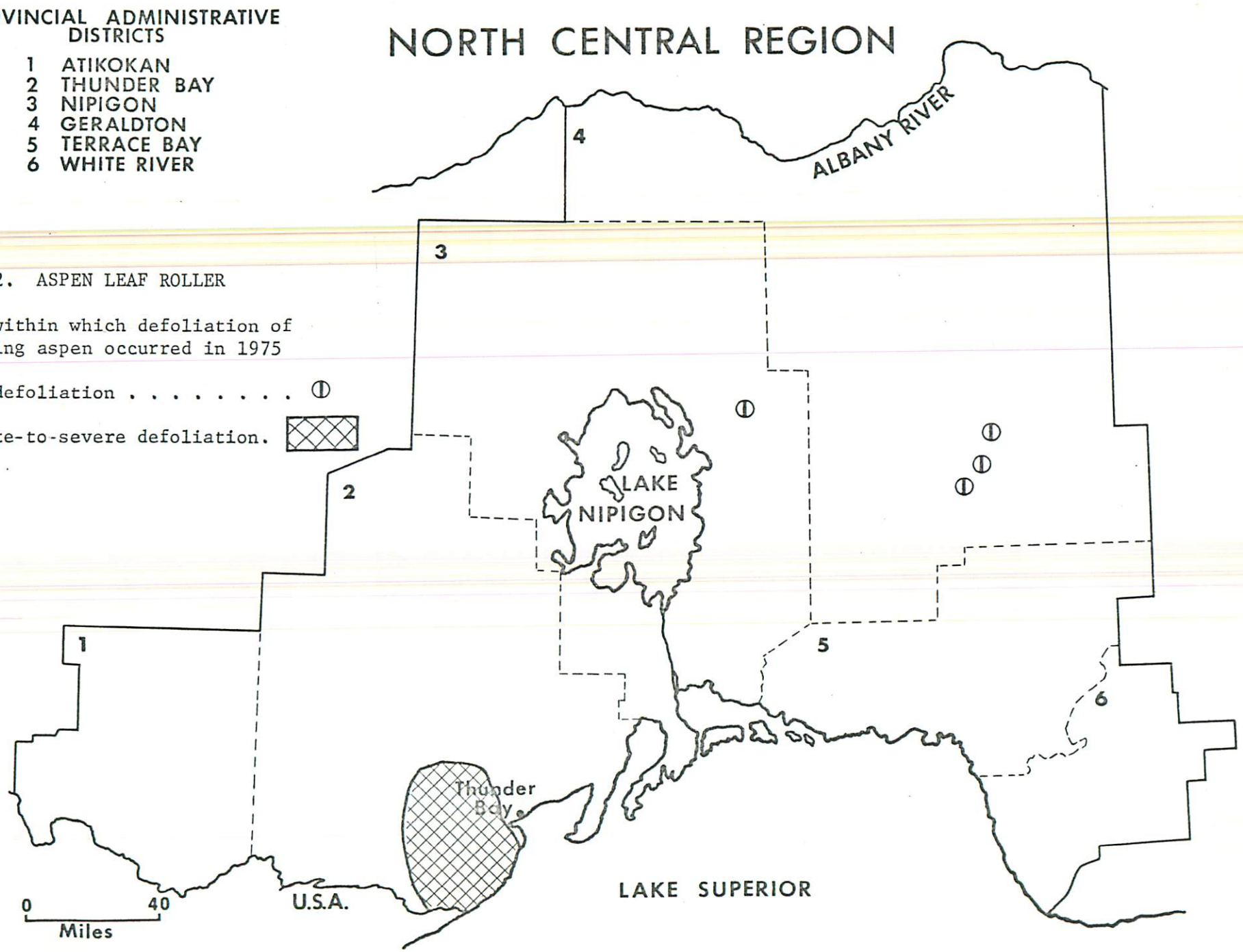


Fig. A2. ASPEN LEAF ROLLER

Areas within which defoliation of trembling aspen occurred in 1975

light defoliation . . . . . ◐

Moderate-to-severe defoliation.