

FOREST INSECT AND DISEASE SURVEYS
IN THE NORTH CENTRAL REGION
OF ONTARIO, 1974

H. R. FOSTER AND M. J. APPLEJOHN

GREAT LAKES FOREST RESEARCH CENTRE
SAULT STE. MARIE, ONTARIO

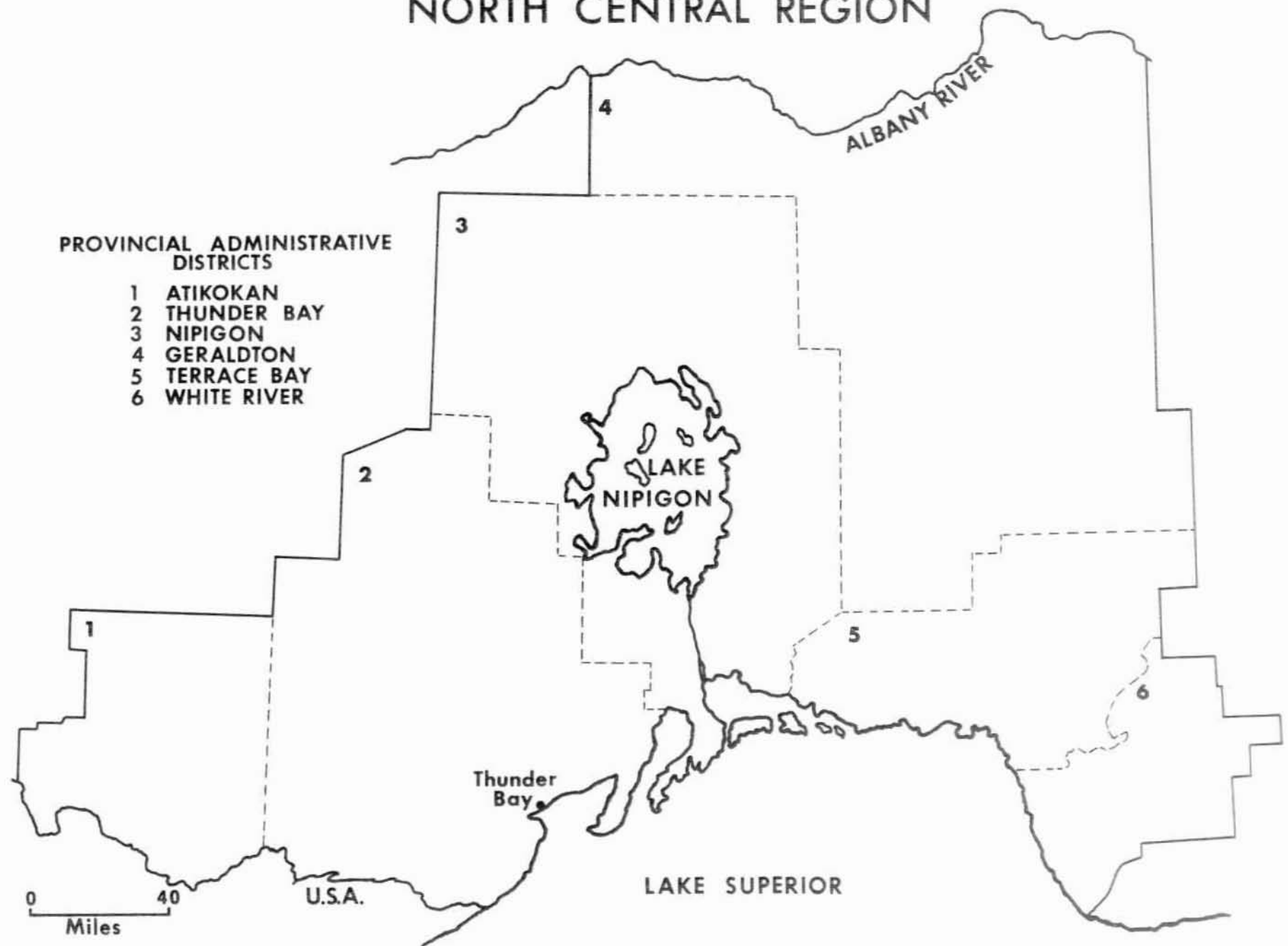
INFORMATION REPORT O-X-221

CANADIAN FORESTRY SERVICE
DEPARTMENT OF THE ENVIRONMENT
APRIL 1975

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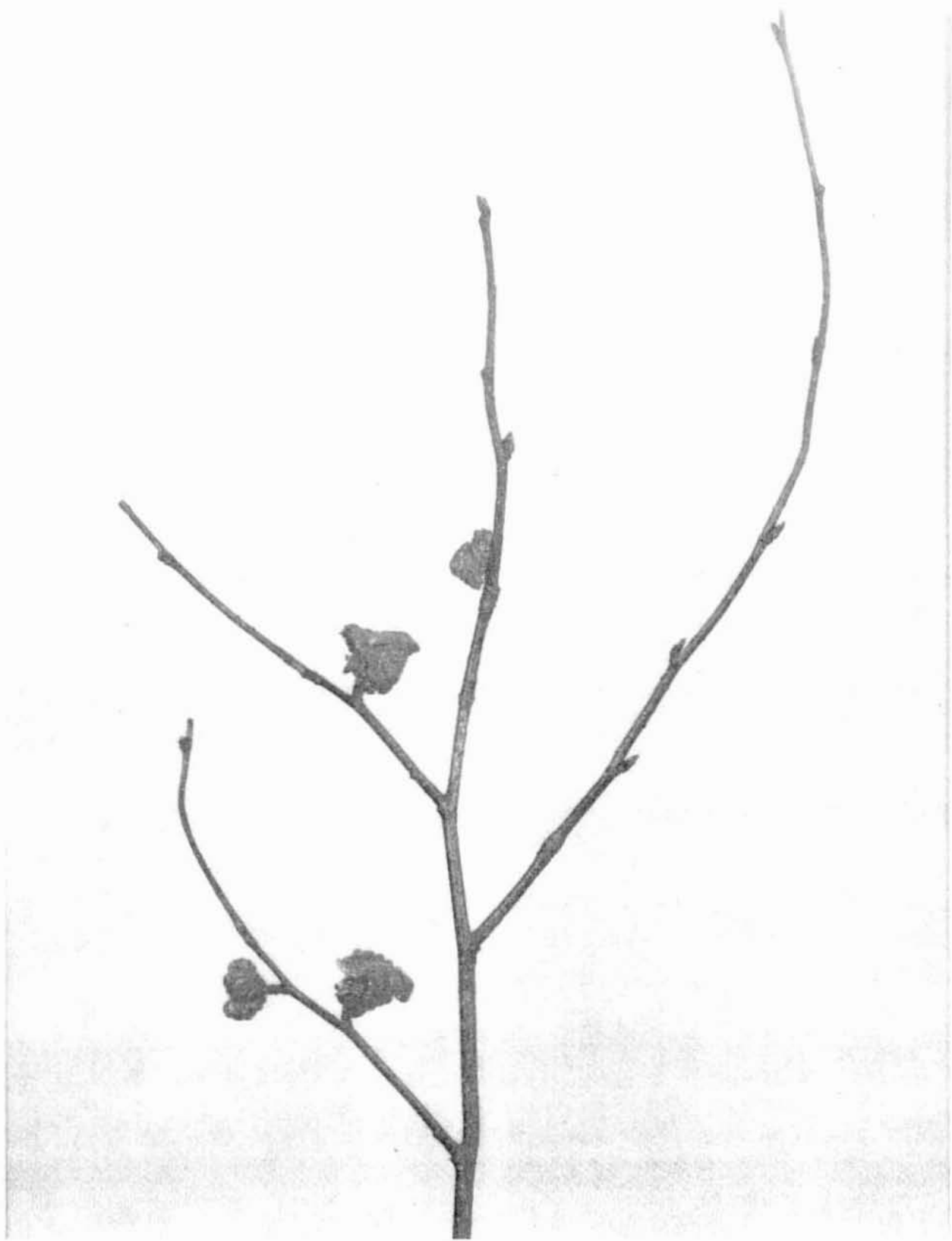
*Director,
Great Lakes Forest Research Centre,
Canadian Forestry Service,
Department of the Environment,
Box 490, Sault Ste. Marie, Ontario.
P6A 5M7*

NORTH CENTRAL REGION



ACKNOWLEDGEMENTS

The excellent cooperation received from the Ontario Ministry of Natural Resources and the forest industry in carrying out pest surveys in 1974 is greatly appreciated.



Frontispiece. Deterioration of white birch following severe defoliation in 1973 by the birch skeletonizer. Many of the leaves failed to open fully and some twig mortality occurred.

SURVEY HIGHLIGHTS

Weather was a dominant factor in the spread of both insects and tree diseases in 1974. A late spring, followed by high moisture conditions during late May and early June and near normal weather in July and August east of Lake Nipigon, contrasted sharply with the drought conditions that persisted from May through August west of the lake. The early termination of the field season created some problems in completing surveys for late-season insects.

Successful spray operations in 1972 and 1973 reduced budworm populations to trace levels in the Atikokan and Thunder Bay districts. However, moderate populations occurred over a total of roughly 1,300 acres (526 ha) including areas at Prairie Portage on Basswood Lake and between Little Eva Lake and Namakan River in the Atikokan District. Populations in the White River District, in the southeastern areas of the Terrace Bay District and in the Caramat and Pagwachuan River sectors of the Geraldton District remained low although the numbers of larvae did increase in all three districts. Populations of the blackheaded budworm increased markedly, whereas preliminary surveys indicated substantially reduced numbers of the birch skeletonizer. Infestations of the large aspen tortrix declined in the Atikokan, Thunder Bay, Geraldton and White River districts, whereas moderate-to-severe defoliation occurred in the Beardmore-Orient Bay-Leopard Lake area in the Nipigon District as well as eastward to the south end of Long Lake in the Geraldton and Terrace Bay districts. Moderate-to-severe defoliation of aspen stands by the forest tent caterpillar recurred in the Jellicoe and Onaman River areas in the Nipigon District, and in the Pagwachuan River area of the Geraldton District.

Considerable time was spent gathering information on the Scleroderris canker of pine in areas east of Lake Nipigon. Disease work west of the lake included work on the red pine shoot blight. Plots were established to study the impact of these two diseases and the progress of single-tree mortality of balsam fir. Special collections of small dead jack pine, black spruce, white spruce and balsam fir were made across the Region for determining the fungi present. Needle rusts of spruce were generally higher than usual at many points.

H. R. Foster
Supervisor
North Central Region

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INSECTS

Blackheaded Budworm, *Acleris variana* Fern.

The general increase in the intensity of infestations detected in many areas west of Lake Nipigon in 1973 persisted and new infestations were observed in many areas east of the lake to the Pagwachuan River Road. Medium infestations occurred on balsam fir (*Abies balsamea* [L.] Mill.) trees at Klotz Lake in the Geraldton District, in Ledger Township in the Nipigon District, and in Hambleton Township in the White River District (Fig. 1). Light infestations were observed on black spruce (*Picea mariana* [Mill.] B.S.P.) at Smoothwater and Grayson lakes in the Nipigon District. Small numbers of larvae were found on balsam fir, black spruce and white spruce (*Picea glauca* [Moench] Voss) at numerous locations across the Region.



Figure 1. Defoliation of balsam fir foliage by the blackheaded budworm at Koltz Lake.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

The early termination of the field season precluded aerial surveys to assess the overall status of this insect. However, low population levels of early instars were present in impact plots in Nipigon, Geraldton and Terrace Bay districts (Table 1). None of the trees in the impact plots in the Geraldton District put forth adventitious shoots to replace branches or crown sections killed in 1971, but, with the drop in population levels from 1972 to 1974, the growth of surviving branches and crown sections has gradually returned to near normal.

One hundred white birch (*Betula papyrifera* Marsh.) trees were tagged and numbered in a stand near Orient Bay in 1973 and overall defoliation estimates averaged 90%. Minor twig and branch mortality was evident on 11 trees in 1974. However, appreciable branch mortality occurred in a small group of nearby trees on which defoliation had been virtually complete in 1973. Leaves failed to appear at the top of crowns in the spring of 1974 (see Frontispiece).

Table 1. Summary of skeletonizing by the birch skeletonizer in three districts from 1972 to 1974 (based on the detailed examination of 10 trees at each location)

Location	Avg DBH of trees (in.) ^a	Proportion of foliage fully damaged		
		1972	1973 (%)	1974
Nipigon District				
Orient Bay	3	90	90	5
Geraldton District				
Caramat	3	10	5	1
Kimberly-Clark Pit Road	5	10	5	1
Goldfield Road	6	75	20	1
Terrace Bay District				
Terrace Bay, north	4	90	60	5

^a 1 in. = 2.54 cm

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

The area of moderate-to-severe defoliation of trembling aspen (*Populus tremuloides* Michx.) which occurred across extensive areas of the Region in 1973 was greatly reduced in 1974. Two sizeable areas of heavy infestation persisted in the Nipigon District (see Appendix,

Fig. A1). The first, covering approximately 70 sq. miles (181.3 sq. km), was located southwest of Armstrong between Collins Lake and the Kopka River, and the second in the Orient Bay-Beardmore-Leopard Lake area, with a narrow arm extending to the south end of Long Lake in the Geraldton and Terrace Bay districts. Light infestation totalling about 30 sq. miles (88 sq. km) occurred between Bedivere Lake and Lac des Mille Lacs and in Neebing Township in the Thunder Bay District. Small areas of light-to-medium infestation also occurred northeast of Lake Nipigon and at a few points in the Nipigon-Terrace Bay area.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of damage surveys, population sampling and egg-mass counts have been included with those of other regions in a special information report by G. M. Howse et al. (O-X-228). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1974 and gives infestation forecasts for the province for 1975.

Birch Leafminer, *Fenusa pusilla* (Lep.)

Heavy infestation occurred on ornamental birches in the city of Thunder Bay, along the International Nickel Company road south of Shebandowan Lake in the Thunder Bay District, and in French Lake Park in the Atikokan District. Infestations along the Boreal Road and in the Marks Lake area declined to medium intensity. Pockets of medium infestation were scattered south of Beardmore to Orient Bay in the Nipigon District and in the Diversion Road area in the Terrace Bay District. A new northern distribution record for the Region was established at Terrier Lake about 30 miles (48 km) northwest of Nakina in the Geraldton District.

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

Localized pockets of severe defoliation occurred north of Dorion and near the Upper Dog River in the Thunder Bay District. A medium infestation was observed on trembling aspen reproduction on the west side of Muskrat Lake in the Nipigon District. In the Geraldton District pockets of medium infestation were located near Lucy and Twin lakes, west of Longlac, and in Bain and O'Meara townships. Elsewhere in the Region small numbers of colonies were observed west of a line through Lake Nipigon and less commonly to the east.

Blotchminers on Poplar, *Lithocolletis ontario* Free., and *L. nipigon* Free.

Heavy infestations of the blotchminer on poplar (*L. ontario* Free.) were recorded in all six districts. The most notable of these occurred on trembling aspen reproduction in Paipoonge and Stedman townships in the Thunder Bay District, near Black Sturgeon Lake in the Nipigon District, and in areas east of Longlac in the Geraldton District. Infestations of light and medium intensity were observed at many other points.

A blotchminer (*L. nipigon* Free.) that causes similar damage to balsam poplar (*Populus balsamifera* L.) severely mined foliage at Kakabeka Falls, east of Pigeon River, and in Blake Township in the Thunder Bay District. Infestation was also heavy along the Poshkokagan River in the Nipigon District. Light infestations were common elsewhere in the Region.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Obvious defoliation of broad-leaved trees by the forest tent caterpillar, extending into the Geraldton District from the Savoff-Hearst area of the Northern Region, increased in 1974 to include most of Bicknell Township and parts of Boyce and Clavet townships, and a small infestation in nearby Bell Township doubled in size. The heavy infestation in Leduc and Walters townships in the Nipigon District tripled in size to about 150 sq. miles (389 sq. km). The pocket of heavy infestation at Mile 13 on the Onaman Lake Road showed only a minor increase. Elsewhere in the area east of Lake Nipigon larvae and pupae were scarce, whereas west of the lake wandering larvae and colonies were observed at widely scattered points.

Dissection of cocoons at two locations indicated that 35 and 51%, respectively, of the late larval and pupal populations gave rise to adult moths (Table 2). Egg surveys suggest that the infestations will continue generally at increased intensity in 1975 (Table 3).

Table 2. Summary of forest tent caterpillar cocoon dissections in two districts in 1974 (based on the examination of 100 cocoons at each location)

Location	Successful adult emergence (%)	Parasitized (%)	Unexplained mortality (%)
Nipigon District			
Nezah, north	35	59	6
Geraldton District			
Clavet Twp	51	42	7

Table 3. Summary of forest tent caterpillar egg-mass counts in two districts in 1974 and infestation forecasts for 1975

Location	Avg DBH of trees (in.) ^a	No. of trees sampled	Avg no. of egg bands per tree	Infestation forecast for 1975
Nipigon District				
Onaman River	8	1	76	heavy
Humboldt Bay Road	6	3	0	nil
McComber Twp	5	3	10	medium
Walters Twp	6	1	111	heavy
Leduc Twp	9	1	57	heavy
Geraldton District				
Ashmore Twp	6	3	0	nil
Clavet Twp	9	1	93	heavy

^a 1 in. = 2.54 cm

White Pine Weevil, *Pissodes strobi* (Peck)

Damage levels of this insect remained essentially unchanged in 1974. Heavy damage occurred on black spruce reproduction at a location along Hwy 17 in Trewartha Township in Thunder Bay District, with 39% of the leaders attacked (Table 4). Medium infestations were noted on white spruce in Conmee Township and on Norway spruce (*Picea abies* L. Karst.) at Marks Lake in the Thunder Bay District, on white spruce in The Geraldton District, and in a white spruce plantation in the Terrace Bay District. Light infestations were observed on jack pine (*Pinus banksiana* Lamb.) at several locations north of Graham, on ornamental red pine (*Pinus resinosa* Ait.) and Norway spruce in Paipoonge Township in Thunder Bay District, and on jack pine along Hwy 11 near Eva Lake in Atikokan District. Small numbers of weevilled trees were common in the remainder of the survey area.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

A general increase in defoliation of larch (*Larix* spp.) was evident in late summer. Small pockets of heavy infestation were observed in the vicinity of Rawn, Buckingham and Kawnipi lakes in the Atikokan District; in small stands between Raith and English River, north of Metionga and Hard Dog lakes and east of Harmon Lake in the Thunder Bay District; and at four locations northwest of Lake Nipigon in the Nipigon District (see Appendix, Fig. A2). Medium infestations occurred along

the expressway in the city of Thunder Bay and in Ledger Township in the Nipigon District. Light infestations were common in the White River, Geraldton and Terrace Bay districts.

Table 4. Summary of damage by the white pine weevil in two districts from 1972 to 1974 (based on the examination of 100 trees at each location)

Location	Host	Avg DBH of sample trees (in.) ^a	Trees weevilled		
			1972	1973 (%)	1974
Thunder Bay District					
Marks Lake Road	rP	2	7	4	6
Marks Lake Road	jP	2	21	12	9
Conmee Twp	wS	3	35	8	18
Marks Twp	nS	1	18	18	19
Trewartha Twp	bS	1	-	-	39
Atikokan District					
Hwy 11 at Eva Lake	jP	1	-	1	4

^a 1 in. = 2.54 cm

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

Distribution of this introduced insect remained virtually unchanged in 1974. However, heavy infestations persisted on ornamental mountain ash (*Sorbus americana* Marsh.) trees in the city of Thunder Bay and its environs and in the area immediately south of Kakabeka Falls. Moderate defoliation was observed in the Pigeon River area. Medium-to-heavy infestations that occurred in the southeast corner of the Terrace Bay District in 1973 declined to light in 1974 as did similar infestations in the Geraldton District in the vicinity of Lukinto and Pagwachuan lakes.

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

These three insects increased in number in varying proportions at several locations, and their attack on buds and new foliage of spruce trees caused unsightly discoloration of foliage. In the Thunder Bay District, heavy infestations occurred on black and white spruce wind-breaks in the Thunder Bay Forest Station while severe damage on ornamentals in the city of Thunder Bay prompted numerous public inquiries.

Moderate damage was observed on open-grown white spruce at several locations on the Sibley Peninsula, in the vicinity of the North Coldstream Mine at Burchell Lake, and along the North Heaven Lake Road. In the Nipigon District damage was moderate at points north of Cameron Falls. Smaller numbers of larvae were common elsewhere in the Region.

Poplar Blackmine Beetles, *Zeugophora abnormis* Lec., and *Z. varians* Cr.

Two species of poplar blackmine beetles are known in the eastern half of the Region. The species *Z. abnormis* Lec., which usually attacks balsam poplar and willow (*Salix* spp.) has been more abundant, with *Z. varians* (a pest of trembling aspen) being relatively scarce. The year 1974 marked the first time when the latter species was more abundant. This may be accounted for by the beetle's delay of more than a week in ovipositing, as it was thereby protected from the severe frost that killed many young larvae and eggs of the former species (see Northern Survey Region Report, 1972). Light populations of both species were observed at Pagwachuan Lake and in the townships of Ashmore and O'Meara in the Geraldton District, and north of the Kimberley-Clark pulp mill in the Terrace Bay District.

Table 5. Other forest insects

Insect	Host(s)	Remarks
<i>Agrilus anxius</i> Gory	wB	common on dieback-affected trees in the city of Thunder Bay
<i>Anoplonyx luteipes</i> Cress.	tL	few larvae on mat samples east of Longlac, Geraldton District
<i>Archips cerasivoranus</i> (Fitch)	ecCh	general increase in Diversion Road area, Terrace Bay District
<i>Arge pectoralis</i> (Leach)	wB	a few colonies at Pagwachuan Lake, Geraldton District
<i>Chrysomela falsa</i> Brown	W	low populations along Old Graham Road, Thunder Bay District
<i>Conophthorus resinosae</i> Hopk.	jP	light infestation at Graham Airport, Thunder Bay District

(continued)

Table 5. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Dimorphopteryx melanognathus</i> Roh.	wB	larvae scarce but observed more often than in recent years in White River and Geraldton districts
<i>Dioryctria reniculelloides</i> Mut. & Mun.	wS	found commonly across the Region
<i>Diprion hercyniae</i> (Htg.)	wS	a few larvae on beating samples in Geraldton, White River, Terrace Bay and Nipigon districts
<i>Epinotia lindana</i> Fern.	Do	medium infestation in Pardee Twp, Thunder Bay District
<i>Eucosma gloriola</i> Heinr.	mP, rP	heavy on ornamental mugho pine and light on red pine seedlings in the Thunder Bay Forest Station
<i>Hylobius warrenii</i> Wood	jP, ScP	medium-to-heavy root collar damage at several locations in the Thunder Bay-Kakabeka Falls area; trace in O'Meara Twp, Geraldton District and at Sturgeon River, Nipigon District
<i>Hyphantria cunea</i> Dru.	W, Al, tA	increased numbers of nests observed in the Thunder Bay and Nolalu areas, Thunder Bay District
<i>Lambdina fiscellaria</i> <i>fiscellaria</i> Gn.	wS	a few larvae near Terrace Bay
<i>Lyonetia</i> (probably new species)	W	heavy north of Hwy 11 and east of Lake Nipigon to Pagwachuan River in the Geraldton and Nipigon districts
<i>Malacosoma californicum</i> <i>pluviale</i> Dyar	pCh, W	small numbers of tents observed commonly across the Region

(continued)

Table 5. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Neodiprion abietis</i> complex	wS, bF, bS	light infestations on white spruce in Clavet Twp, Geraldton District; trace population on balsam fir at points between Marathon and White River, White River District; at several locations in Quetico Park, Atikokan District; and at Holinshead Lake in Thunder Bay District
<i>Neodiprion maurus</i> Roh.	jP	trace population near Graham, Thunder Bay District
<i>Neodiprion pratti banksianae</i> Roh.	jP	a few colonies in Ashmore Twp, Geraldton District; Herbert Twp in Terrace Bay District; and in the vicinity of the city of Thunder Bay
<i>Neodiprion virginianus</i> complex	lP, jP	heavy on ornamental jack pine at French Lake Park, Atikokan District; light on lodgepole pine in O'Meara Twp, Geraldton District; and on jack pine at several locations in the northern sections of Nipigon and Geraldton districts
<i>Petrova albicapitana</i> (Busck.)	jP, lP	light on lodgepole pine in O'Meara Twp, Geraldton District and on jack pine at several locations in the northern sections of Nipigon and Geraldton districts
<i>Phratora purpurea purpurea</i> Brown	tA	more commonly observed in 1974 than in previous years
<i>Phyllocolpa agama</i> (Roh.)	narrow-leafed W	heavy at Pagwachuan Lake, Geraldton District
<i>Pikonema alaskensis</i> (Roh.)	wS, bS	varying degrees of infestation on open-grown trees at numerous points across the Region

(continued)

Table 5. Other forest insects (concluded)

Insect	Host(s)	Remarks
<i>Pikonema dimmockii</i> (Cress.)	wS, bS	small numbers on beating samples at many locations across the Region
<i>Pleroneura brunneicornis</i> Roh.	bF	light-to-moderate damage at many points in the Region
<i>Profenusa thomsoni</i> (Konow)	wB	trace levels at O'Sullivan and Kenogamisis lakes in Geraldton District and at several locations in the northern part of the Nipigon District
<i>Pseudexentera oregonana</i> Wlshm.	tA	light in Lukinto Lake area, Geraldton District
<i>Rhabdophaga swainei</i> Felt.	wS, bS	light at many points in the Region
<i>Rhyacionia adana</i> Heinr.	jP	trace levels in plantations south of Longlac, Geraldton District
<i>Toumeyella numismaticum</i> (P. & M.)	jP	a small area of medium infestation at mile 25, Black Sturgeon Road, Nipigon District

TREE DISEASES

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

Small numbers of young conifers have been dying each year in second-growth stands and plantations in widespread cutover areas of the Region. Collections of roots of newly killed trees were made to determine the fungi involved. Armillaria root rot was isolated from 89% of the roots submitted (Table 6). The frequencies of *A. mellea* and eight other fungi in host tree species are shown in Table 7. These results confirm the widespread distribution of *A. mellea* and show the consistency with which this organism is associated with recently dead trees. Mortality of the type surveyed is considered to be of especial importance in poorly stocked stands.

Table 6. Incidence of Armillaria root rot isolations from recently killed trees in five districts in 1974

Location	Tree species	No. of root systems collected	No. infected by <i>A. mellea</i>
Geraldton District			
Bain Twp	jP	5	5
Bain Twp	bF	1	1
O'Meara Twp	bF	3	3
O'Meara Twp	bS	5	5
O'Meara Twp	wS	3	3
Ogahalla Road	bS	5	4
Terrace Bay District			
Hagerty Creek	jP	5	5
Black Creek, north	jP	5	4
Nipigon District			
Blackwater Creek	jP	5	5
Sturgeon River, west	wS	1	1
Blackwater Creek	bS	2	1
Sturgeon River, southwest	jP	5	5
Onaman Lake Road	jP	5	5
Onaman Lake Road	bF	5	2
White River District			
Twp 32 Rge 28	jP	5	4

(continued)

Table 6. Incidence of *Armillaria* root rot isolations from recently killed trees in five districts in 1974 (concluded)

Location	Tree species	No. of root systems collected	No. infected by <i>A. mellea</i>
Thunder Bay District			
Mile 5, Marks Lake Road	rP	5	4
Meinzinger Twp	rP	2	2
High Falls, Pigeon River	bF	4	3
Hwy 800, south of Kabitotikwia River	bF	4	3
Hwy 800, Mile 32	wS	5	4
Black Sturgeon Lake Road	bS	5	5
Hwy 800, Mile 32	jP	5	5
Majata Lake at Roaring River	jP	5	4
Firesteel River	jP	5	5
Camp 602, Great Lakes Paper Co.	jP	5	5
Marks Lake Road, Mile 6	jP	5	5

Table 7. Frequency of nine organisms associated with the roots of five coniferous hosts in the North Central Region in 1974

Disease organism	No. of attacks recorded for each host					Totals
	jP	rP	wS	bS	bF	
<i>Armillaria mellea</i> (Vahl ex Fr.) Kummer	55	6	9	17	17	104
<i>Penicillium</i> spp.	13	0	2	6	12	33
<i>Coryne sarcoides</i> (Jacq. ex Fr.) Tul.	8	1	0	1	0	10
<i>Trichoderma viride</i> Pers. ex Fr.	8	2	0	1	3	14
<i>Cenococcum grandiforme</i> (Sow.) Ferd. & Winge	3	0	1	2	0	6
<i>Cephalosporium</i> sp.	3	1	0	0	0	4
<i>Scytinostroma galactinum</i> (Fr.) Donk	0	0	0	1	0	1
<i>Typharia</i> spp.	0	2	0	0	0	2
<i>Stereum sanguinolentum</i> (Alb. & Schw. ex Fr.) Fr.	0	0	0	0	1	1
Totals:	90	12	12	28	33	175

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

The incidence and severity of spruce needle rusts increased generally in 1974 (Table 8). High infections occurred on open-grown white and black spruce trees in southeastern Terrace Bay District and northwestern White River District, and on black spruce trees growing on poor sites in northern parts of the Geraldton District. In the Nipigon District a single area of high infection encompassing about 4 sq. miles (10.4 sq. km) was detected south of Brennon Lake. Moderate infection levels were observed in the vicinity of Aldridge Lake. Trace-to-light infections were observed at many additional points. The distinctive discoloration of spruce foliage by these rusts prompted numerous inquiries from the public.

Table 8. Summary of trees affected and needle damage caused by needle rusts of spruce in four districts in 1974

Location	Tree species	Trees affected (%)	Needle damage (%)
Terrace Bay District			
Black River	wS	100	80
Nickle Twp	bS	100	80
Marathon	wS	100	50
Jackfish Lake	wS	100	80
Terrace Bay, north	wS	100	20
Nipigon District			
Parks Lake	wS	50	10
Geraldton District			
Oakes Twp	wS	50	5
Cavell	bS	90	60
Thunder Bay District			
Brennon Lake	bS	100	30

Cone Rust of White Spruce, *Chrysomyxa pirolata* Wint.

This cone rust was observed more often than usual, possibly owing to an extremely high cone crop. High infection levels occurred in Laurie and MacGregor townships, and along the North Heaven Lake Road in the Thunder Bay District. Trace infection occurred elsewhere in the western half of the Region, but the disease was scarce to the east where the white spruce cone crop was generally poor.

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

Pockets of high infection were observed during aerial reconnaissance in the Matthews Lake sector in the White River District and in the Nama Creek and Hillsport areas in the Terrace Bay District. Moderate-to-high infection occurred in extensive areas north of Beardmore in the Nipigon District (Table 9). Infection levels generally were light elsewhere in the eastern part of the Region. West of Lake Nipigon, infections were confined to a few clumps of trembling aspen north of Lac des Mille Lacs and near the Pigeon River. The disease was obviously at its lowest level in 3 years in the Thunder Bay and Atikokan districts. Weather seemed to be the influential factor in this pattern with wet weather prevailing east of Lake Nipigon, and dry weather west of the lake in early summer.

Table 9. Summary of attack and leaf damage caused by ink spot of aspen in the Nipigon District in 1974

Location	Trees affected (%)	Range of leaf damage (%)	Estimated area infected (acres) ^a
Sandra Twp	100	10-50	10,000
Pifher Twp	100	10-50	10,000
Meador Twp	100	10-50	10,000
Irwin Twp	100	30-80	5,000

^a 1 acre = approx. 0.40 ha

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

The incidence and infection levels of this rust on jack pine were high in 1974 in the Nezah area and a few young trees were killed by stem galls at nearby Beardmore in the Nipigon District. High infection levels occurred in young stands in Bain Township and tree mortality continued as the main stems were attacked. Galls were common in young jack pine stands elsewhere in the Nipigon District and in Exton Township in the Geraldton District.

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

The increase in damage by the Scleroderris canker of pine in many jack pine plantations caused considerable concern in areas east of

Lake Nipigon. Infection levels which were high at many locations in 1972 were sharply reduced in 1973, but increased again in 1974 when several new infections were found. A total of 64 evaluations were made in 22 areas to establish the status of the disease in 1974 and the results are shown in Table 10. No disease symptoms could be found during detailed examination of 28 susceptible areas of jack pine covering roughly 12,000 acres (about 4,860 ha). From this it is clear that many young jack pine stands are free of infection. The incidence of attack and tree mortality in nine areas in the Region was sufficient to make future planting of red and jack pine inadvisable. The widespread distribution of the disease (see Appendix, Fig. A3) and its potential importance in preventing the establishment of fully stocked young jack pine stands should be recognized. The following descriptions of the current situation are given by district.

Geraldton District

The most serious infection evaluated in 1974 occurred in about 1,000 acres (about 405 ha) in Bain Township. On the average, 40% of the trees were infected in the Triangle and 11% were killed. A sanitation experiment was carried out by Junior Rangers of the Ontario Ministry of Natural Resources in an attempt to save the stand and to slow down the spread of the disease into nearby uninfected areas. In badly infected areas, all dead trees and infected branches were removed and burned. However, sanitation was limited by lack of time and manpower, and little measurable effects can be expected in 1974. Impact plots were established prior to the sanitation and will provide valuable information as infection and tree mortality continue.

The disease incidence was heavy in Kowkash and Rupert townships northwest of Nakina, but the severity of the infection and tree mortality have decreased as stands have grown beyond the susceptible stage. Similarly, damage in the McKay-McLeod lakes area varied from heavy to trace according to tree size.

Nipigon District

Damage and tree mortality at Cosgrave Lake were reduced from heavy in 1973 to moderate in 1974, and damage in the future should become less each year as the trees increase in size. Although tree mortality has been high for 3 years in this area, enough living stems per acre remain for an adequate stocking of jack pine. The incidence of attack ranged from light to heavy in Sandra, Eva, Pifher, Meader and Irwin townships, but the trees are well advanced and very little mortality has occurred. Stands in cutover areas north of Onaman River showed light attack at a few points.

Terrace Bay District

The incidence of the disease varied from light to heavy but current infection levels and mortality were generally low at the junction of the Manitouwadge and Hillsport roads, in the Stevens-Caramat area, at Marathon, Neys Park and in Township 83. Infection levels increased appreciably in the Manitou Falls sector and spread into other young plantations. New infections were light at Palmquist Lake in scarified and seeded areas, and heavy in the Manitou Falls area where a previously reported infection also increased appreciably. The infection in Nickle Township increased to heavy in pockets, and threatens to spread into extensive plantings of young trees in the adjoining township of Herbert.

A sanitation trial to test the possibility of achieving control of the disease by pruning branches of red pine to a height of 4 1/2 ft (137.16 cm) was continued in Neys Park in 1974, but a few years will be required to assess completely the effects of pruning as a means of sanitation. A stand of jack pine isolated from other infections in the Palmquist Lake area provided the opportunity for a different kind of sanitation trial. Although pockets of high infection occurred, less than 10 out of 292 acres (about 118 ha) were lightly infected and some of the trees were approaching a height at which they would no longer be susceptible. Junior Rangers removed and burned all dead trees and infected branches within the 10 acres in an attempt to avoid appreciable mortality and to test the effect of reducing the amount of inoculum in the area on the incidence and infection levels of the disease in 1975.

White River District

The disease has become well established in cutover areas in Flood, Mikano, Magone and Atikameg townships but little tree mortality has occurred in these older stands in recent years. Elsewhere in the district Scleroderris canker of pine could not be found in plantations of nursery stock and tubelings, or in seeded and scarified areas.

Thunder Bay District

Infections in the Graham area declined to a very low level in 1974. Sporadic trace infections were observed for 16 miles (25.6 km) along the Graham Road to the vicinity of the airport; however, regeneration jack pine on scarified sites in the area have suffered very little damage.

Table 10. Summary of incidence, level of severity, tree mortality and estimated areas of damage caused by the Scleroderris canker of pine in five districts in 1974

Location	Host species	Trees affected (%)	Trees severely attacked (%)	Trees dead (%)	Estimate of area affected (acres) ^a
Geraldton District					
Bain Twp, Triangle east	jP	22	4	6	1000
Bain Twp, Triangle west	jP	59	8	17	1000
Bain Twp, east of Triangle	jP	50	5	20	10
Bain Twp, $\frac{1}{2}$ mi. E of Triangle	jP	60	5	5	100
Bain Twp, 1 mi. E of Triangle	jP	90	10	30	100
Bain Twp, north of Triangle	jP	10	2	2	100
Kowkash Twp (1 & 1B)	jP	40	8	5	150
Kowkash Twp (A)	jP	50	10	10	21
Kowkash Twp (5C)	jP	20	5	5	30
Kowkash Twp (4)	jP	30	5	10	11
Rupert Twp	jP	30	10	5	10
Caramat, 10 mi. east	jP	50	1	2	25
Nipigon District					
Cosgrave Lake	jP	99	21	17	200
Eva Twp	jP	1	0	0	100
Eva Twp	rP	10	0	0	10
Sandra Twp	rP	30	0	0	100
Sandra Twp	wP	60	10	0	10
Sandra Twp	jP	10	1	1	250
Summers Twp	jP	2	0	0	200
Fairloch Lake	jP	20	2	1	100
Crooked Green Lake	jP	5	1	1	200
Irwin Twp	jP	5	0	0	374
Pifher Twp	jP	20	1	1	1000
Pifher Twp, northwest	jP	40	5	5	50
Sandra Twp, west	jP	10	2	1	200
Sandra Twp, west	rP	40	0	0	276
Rout Lake, Onaman Road	jP	2	0	0	500
Terrace Bay District					
Manitou Falls, northeast	jP	2	1	1	500
Manitou Falls, southeast	jP	44	7	10	2260
Palmquist Lake, area (a)	jP	20	5	5	292

(continued)

Table 10. Summary of incidence, level of severity, tree mortality and estimated areas of damage caused by the Scleroderris canker of pine in five districts in 1974

Location	Host species	Trees affected (%)	Trees severely attacked (%)	Trees dead (%)	Estimate of area affected (acres) ^a
Terrace Bay District (concl'd.)					
Palmquist Lake, area (b)	jP	5	1	1	292
Palmquist Lake, area (c)	jP	20	3	5	292
Palmquist Lake, area (d)	jP	5	1	1	292
Palmquist Lake, area (f)	jP	5	1	1	292
Palmquist Lake, area (i)	jP	5	1	1	292
Palmquist Lake, area (j)	jP	5	1	1	292
Camp 54, 2 mi. west	jP	2	0	0	521
Stevens Creek	jP	10	1	1	50
Mair Road, Pic River	jP	50	10	5	100
Caramat, 6 mi. south	jP	50	20	10	100
Camp 15, west	jP	2	0	0	100
Camp 15, west and south	jP	2	0	0	100
Camp 15, 2 mi. west	jP	2	0	0	400
Hillsport, west	jP	20	5	2	100
Hillsport-Manitouwadge roads	jP	50	5	0	10
Hillsport-Manitouwadge roads	jP	50	5	2	5
Hillsport, north	jP	2	0	0	100
Nickle Twp, area (a)	jP	70	12	18	100
Nickle Twp, area (d)	jP	35	5	10	100
Nickle Twp, area (e)	jP	5	0	0	25
Nickle Twp, area (h)	jP	20	1	2	5
Nickle Twp, area (i)	jP	10	0	1	2
Nickle Twp, area (j)	jP	5	0	0	2
Little White Otter River	jP	15	5	1	500
White River District					
Flood Twp	jP	10	0	1	-
Flood Twp	rP	30	10	5	60
Mikano Twp	jP	20	10	5	60
Atikameg Twp	jP	1	0	0	35
Magone Twp	jP	2	0	0	200
Thunder Bay District					
Stedman Twp, Camp 5	jP	1	0	0	100
Graham roads junction	jP	3	0	0	300

(continued)

Table 10. Summary of incidence, level of severity, tree mortality and estimated areas of damage caused by the *Scleroderris* canker of pine in five districts in 1974 (concluded)

Location	Host species	Trees affected (%)	Trees severely attacked (%)	Trees dead (%)	Estimate of area affected (acres) ^a
Thunder Bay District (concl'd.)					
Graham Road, Mi. 2 (old road)	jP	1	0	0	1
Graham Airport	jP	6	3	1	10
Graham Radio Tower	jP	1	0	0	2

^a 1 acre = approx. 0.40 ha

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

Work on this disease in 1974 was confined to general observations on its prevalence in various aspen stands in the Region. Hypoxylon canker was rarely found in young stands of trembling aspen on good sites but was quite prevalent on aspen on poor sites, particularly where the moisture conditions were either excessively wet or very dry. More cankering was observed in overmature stands, especially those in which conks of *Fomes igniarius* (L. ex Fr.) Kicks were commonly observed.

Leaf and Twig Blight of Poplar, *Pollaccia radiosa* (Lib.) Bald. and Cif.

The incidence and infection levels of this blight of poplar have remained quite low in recent years. However, the incidence increased to high on regeneration at several points in 1974. Infection levels were also high on regeneration trees near Stevens and moderate at Cosens Lake and near Caramat in the Geraldton District (Table 11). Moderate infection was found at two locations near Hillsport in the Terrace Bay District. Elsewhere in the eastern half of the Region the disease was commonly observed.

A Rust on Balsam Fir, *Pucciniastrum epilobii* Otth

Several pockets of high infection occurred in balsam fir northeast of Sunday Bay at Crooked Lake in the Atikokan District. Aerial reconnaissance over White River District revealed balsam fir trees to be off-color in Hambleton Township. Subsequent ground checks revealed moderate infection by this rust, particularly at points along the

Manitouwadge Road in Terrace Bay District. Increases in incidence were noted at numerous other points in Geraldton, White River, Terrace Bay, Nipigon and Atikokan districts.

Table 11. Summary of trees infected, shoots damaged and area affected by leaf and twig blight of poplar in three districts in 1974

Location	Trees infected (%)	Proportion of new shoots damaged (%)	Area affected (acres) ^a
Geraldton District			
Caramat, 12 miles east	100	10	10
Stevens, 3 miles north	100	70	5
Cosens Lake	100	10	1
Terrier Lake	80	5	1
Nipigon District			
Sandra Twp	40	5	10,000
Terrace Bay District			
Hillsport, 7 miles west	100	20	10
Hillsport, 4 miles south	100	10	23

^a 1 acre = approx. 0.40 ha

Shoot Blight of Pines, *Sirococcus strobilinus* Preuss

This organism was first recognized as the cause of a shoot blight on red pine in northwestern Ontario in 1972. Surveys in early 1973 revealed that the disease was present across most of the Atikokan District as well as in the southwest corner of Thunder Bay District. In 1974, the known range of the disease was extended northward to Allely Lake north of Graham, and east to Orient Bay in the Nipigon District. The disease was also found on jack pine seedlings in Compartment 14 in the Thunder Bay Forest Station on 2-0 nursery stock. This is the first Ontario record from jack pine and the first from a nursery in the province.

Single-tree Mortality of Balsam Fir

Much mortality has been observed within large areas in the eastern half of the Region over the past 3 years. Affected trees are readily detected because the foliage typically turns a bright rust shade. Trees continued to die during the months of July and August in

1974, but generally mortality was lower than in 1973. Impact plots to follow the buildup of mortality were established in areas which showed moderate mortality in aerial counts in 1972 and 1973. Mortality in plots established at Mile 16.3 (26 km) on the Caramat Road, and at Mile 3.3 (5.3 km) on the Pagwachuan Lake Road in the Geraldton District is shown in Table 12. It is obvious that at least along the Caramat Road this problem has had a major influence on stand volumes.

Other areas in which appreciable mortality occurred were in the vicinity of Slim Jim, Loughlan and Meta lakes in the Geraldton District, southeast of Beardmore in the Kinango Lake area in the Nipigon District, and in the rugged terrain north of Lake Superior in the Terrace Bay District. Occasional newly dead balsam trees were observed at many other locations.

Table 12. Summary of single-tree mortality of balsam fir in two impact plots in the Geraldton District in 1974

Location	Avg DBH of trees (in.)	No. of balsam fir trees/acre	Recent tree mortality (%)
Pagwachuan Lake Road	9	125	8
Caramat Road	6	653	10

^a 1 in. = 2.54 cm

Deterioration of White Birch Stands

In the past decade white birch stands in the Region have suffered considerable loss of annual growth plus twig, branch, upper crown and tree mortality. A main cause of the deterioration appears to have been the clearcutting of conifers. This clearcutting leaves the hardwood component, which rapidly deteriorates due to sun scald and to drying out of the root systems (Fig. 2). Similar symptoms were recorded in impact plots established near Caramat and Orient Bay to measure the effect of severe defoliation by the birch skeletonizer.

Drought Injury

Unusually dry weather in July and early August caused widespread foliar damage in the southwestern part of the Region. Drought symptoms were evident across most of the Atikokan District and the southwest corner of the Thunder Bay District as far east as Shebandowan. White birch trees growing on dry sites were the most severely affected and

other deciduous species were less seriously affected. In the southern part of Quetico Park in the Atikokan District jack pine on dry sites with southern exposures also showed the effects of drought, i.e., conspicuous yellowing of foliage. This area has had a history of drought damage to jack pine, especially on high, dry sites and rocky ridges.



Figure 2. Deterioration in a white birch stand exhibiting the typical dying back in the upper crowns of trees that is found extensively in the North Central Region.

Winter Drying

Severe damage by winter drying caused light tree-top mortality in a lodgepole pine (*Pinus contorta* Dougl.) plantation in O'Meara Township in the Geraldton District, and in young jack pine plantings in the Manitou Falls area in the Terrace Bay District. Considerable twig and branch mortality was observed in an older white pine (*Pinus strobus* L.) plantation in Sandra Township, Nipigon District, and in Scots pine (*P. sylvestris* L.) plantations near Mokoman and northeast of Dorion in the Thunder Bay District.

A thinning of jack pine foliage, probably related to severe winter drying that occurred in 1973, was observed in over half of the

eastern part of the Atikokan District. Most stands in an area of about 5000 sq. miles (12,950 sq. km) appeared to have extremely thin foliage when viewed from the air. Small pockets of tree mortality were observed at several locations in the above area.

Table 13. Other forest diseases

Organism	Host(s)	Remarks
<i>Apiosporina collinsii</i> (Schw.) Hoehn.	Ser	trace levels at many points in the Region
<i>Arceuthobium pusillum</i> Pk.	bS	high in a few acres near Lynn Lake, Geraldton District, west of Raith and south of Sparkling Lake, Thunder Bay District
<i>Botrytis cinerea</i> Pers. ex Fr.	jP	light infection in Compartment 14, Thunder Bay Forest Station
<i>Cenangium ferruginosum</i> Fr. ex Fr.	jP	trace in Kowkash Twp, Geraldton District, and Stedman Twp, Thunder Bay District
<i>Chrysomyxa arctostaphyli</i> Diet.	bS	light near Pays Plat and trace at several other points in the Region
<i>Coleosporium asterum</i> (Diet.) Syd.	lpP	light to heavy on lodgepole pine in O'Meara Twp, Geraldton District
<i>Cronartium coleosporioides</i> Arth.	jP	trace infection near Hillsport, Terrace Bay District
<i>Cronartium comandrae</i> Pk.	jP	high in conjunction with other diseases at Graham Airport, Thunder Bay District; trace in Legault Twp, Nipigon District
<i>Cronartium ribicola</i> J. C. Fisch.	wP	high infection with some tree mortality in Sandra Twp, Nipigon District and McTavish Twp in Thunder Bay District; light in Ledger Twp, Nipigon District

(continued)

Table 13. Other forest diseases (continued)

Organism	Host(s)	Remarks
<i>Davisomycella ampla</i> (Davis) Darker	jP	trace levels near Caramat, Terrace Bay District
<i>Gymnosporangium clavipes</i> (Cke. and Pk.) Cke. and Pk.	J	new host record on creeping juniper at Northern Light Lake, Thunder Bay District
<i>Lachnellula chrysophthalma</i> (Pers.) Karst.	jP	trace in Exton Twp, Geraldton District
<i>Leptostromela</i> sp.	jP	associated with moderate needle cast in Stirling Twp, Nipigon District
<i>Lophodermium pinastri</i> (Schrad. ex Hook.) Chev.	jP, rP ScP	causing severe needle and shoot damage to planted red pine north of Marks Lake, Thunder Bay District; trace to light on Scots pine wind- breaks in Thunder Bay Forest Station and on jack pine in Mikano Twp, White River District
<i>Macrophoma tumefaciens</i> Shear	bPo	high on a few trees at Terrace Bay Hydro
<i>Melampsora bigelowii</i> Thuem.	W	high at the north end of Black Sturgeon Lake, Nipigon District
<i>Nectria</i> spp.	tL	causing stem cankers and mortality to pockets of tamarack reproduction south- east of Kabatotikwia River, Nipigon District
<i>Pollaccia elegans</i> Serv.	bPo	light at several locations in the Region
<i>Puccinia violae</i> (Schum.) DC.	Violet	high along Graham Road, Thunder Bay District
<i>Rhizina undulata</i> Fr. ex Fr.	humicolus	trace at Grayson Lake, Nipigon District
<i>Valsa pini</i> (Alb. & Schw.) Fr.	rP, ScP	associated with shoot damage in the Thunder Bay Forest Station and planted red pine at Pine Portage in the Nipigon District

(continued)

APPENDIX

Table 13. Other forest diseases (concluded)

Organism	Host(s)	Remarks
Frost damage	bF	light in frost pockets at a few points in Nipigon and Geraldton districts

NORTH CENTRAL REGION

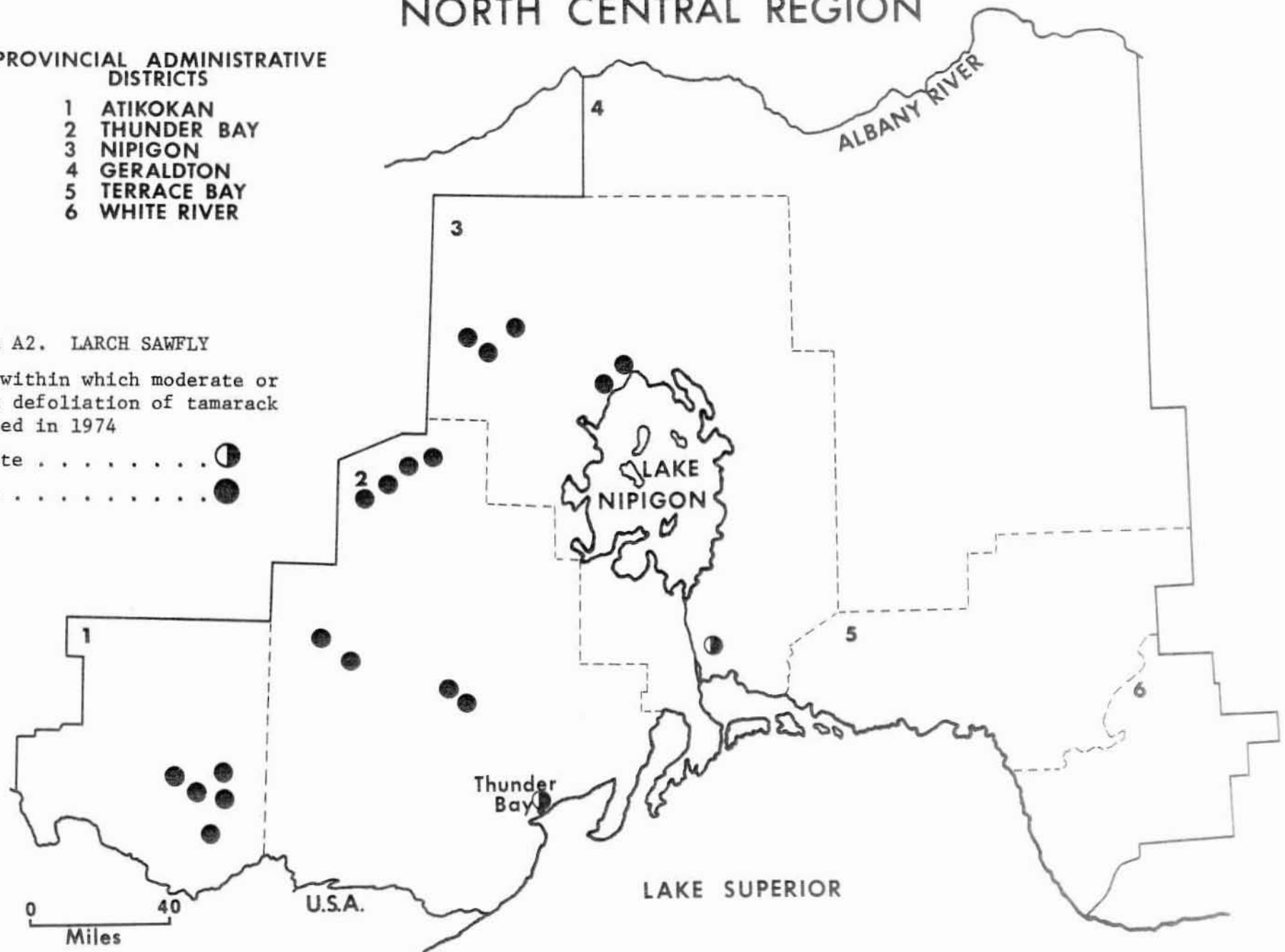
PROVINCIAL ADMINISTRATIVE DISTRICTS

- 1 ATIKOKAN
- 2 THUNDER BAY
- 3 NIPIGON
- 4 GERALDTON
- 5 TERRACE BAY
- 6 WHITE RIVER

Figure A2. LARCH SAWFLY

Areas within which moderate or severe defoliation of tamarack occurred in 1974

Moderate 
Severe 



NORTH CENTRAL REGION

PROVINCIAL ADMINISTRATIVE DISTRICTS

- 1 ATIKOKAN
- 2 THUNDER BAY
- 3 NIPIGON
- 4 GERALDTON
- 5 TERRACE BAY
- 6 WHITE RIVER

Figure A3. SCLERODERRIS CANKER OF PINE

Locations of infection centers
recorded in 1973 and 1974

