

FOREST INSECT AND DISEASE SURVEYS
IN THE NORTHERN SURVEY REGION, 1973

H. R. FOSTER AND J. HOOK

GREAT LAKES FOREST RESEARCH CENTRE
SAULT STE. MARIE, ONTARIO

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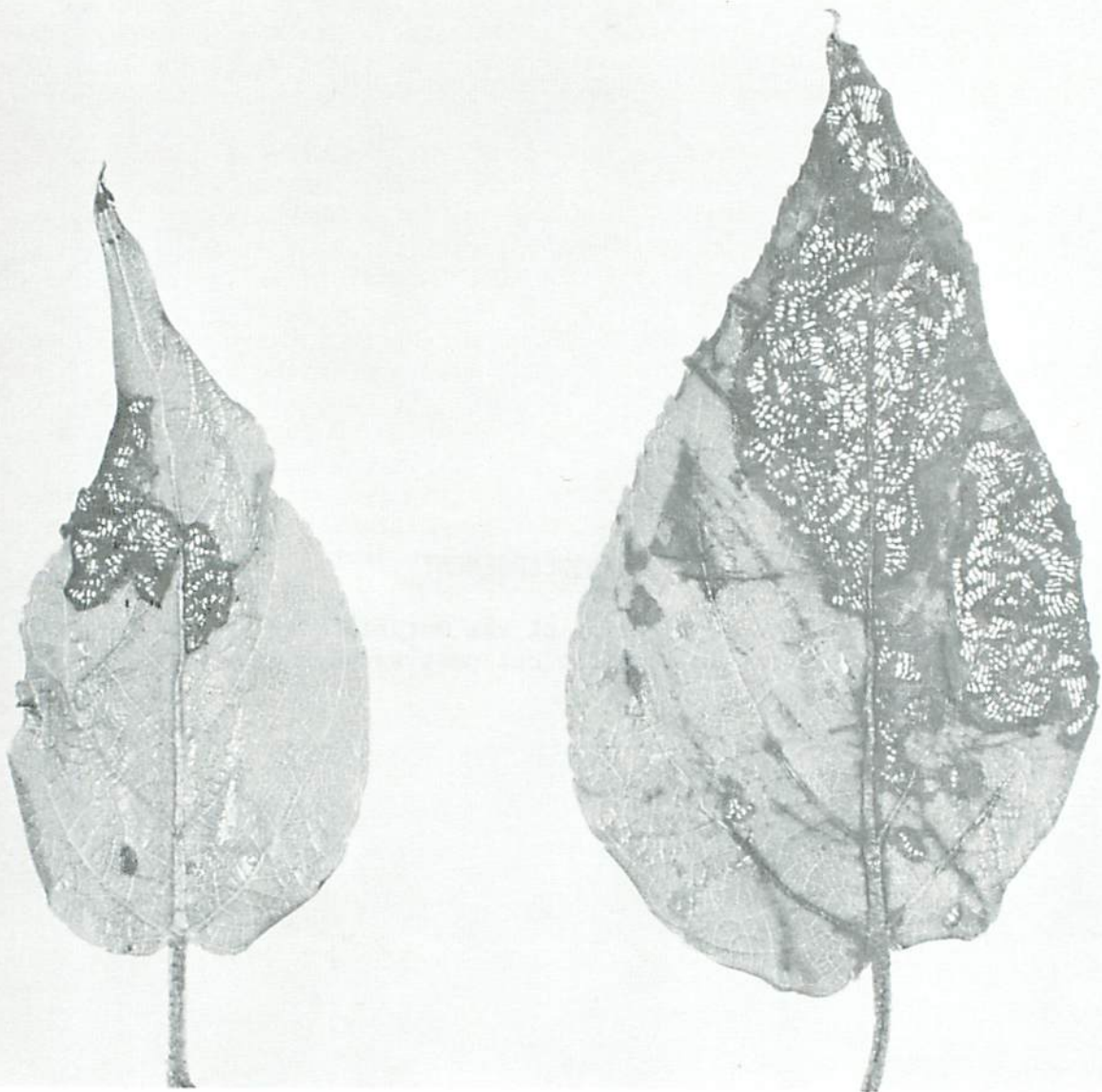
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*Copies of this report may be obtained
from*

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

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Frontispiece. Pattern of feeding on balsam poplar leaves caused by adults of the poplar black-mine beetle, *Zeugophora abnormis* Lec.

SURVEY HIGHLIGHTS

Dry weather that persisted in early summer greatly retarded the development of several important tree disease organisms in the Northern Survey Region and in combination with warm weather, which continued well into October, favoured tree growth and the development of most insects.

The spruce budworm continued to be the most destructive insect. Populations partially recovered from the effects of the snowstorm and cold weather of late May, 1972 in the Hearst, Kapuskasing and Timmins districts. Light infestations are forecast for some stands not previously infested. Populations of the birch skeletonizer increased appreciably in the Nipigon District and in the western parts of Geraldton and Terrace Bay districts but declined elsewhere. Large areas of heavy infestation of the large aspen tortrix occurred in the Region. A heavy infestation of the forest tent caterpillar at Savoff River tripled in size in 1973 and a new heavy infestation occurred in the Jellicoe area.

Disease surveys were concentrated on evaluations designed to accumulate more detailed information on the status of the more important diseases and their effects on stands. Scleroderris canker of pine and hypoxylon canker of poplar continued to cause serious damage. Single-tree mortality of balsam fir occurred in the western sections of the Region at levels comparable to those of 1972. Other noteworthy disease problems were Armillaria root rot, white pine blister rust, needle rusts of spruce, and stem and needle rusts of jack pine.

H. R. Foster
Supervisor
Northern Survey Region

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INSECTS

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Heavy birch skeletonizer infestations recurred in the Nipigon District and western part of the Geraldton district and there was a spread east to Longlac and to the mouth of the Little Pic River in Terrace Bay District (see Appendix, Fig. A1). Complete defoliation or severe browning of white birch (*Betula papyrifera* Marsh.) foliage was widespread by September 5 when aerial mapping was carried out. Light infestations occurred east from the Nakina-Longlac area to Studholme and Wicksteed townships in the Hearst District and along Lake Superior in the southeastern part of the Terrace Bay District. Pockets of light infestation were present in the Remi Lake-Chain of Lakes area in the Kapuskasing District.

The heavy infestation in the Kettle Lakes-Iroquois Falls area in the Cochrane and Timmins districts in 1972 decreased to light intensity in 1973. However, larval development was slow in the area and feeding was still in progress at the close of the field season. The amount of skeletonizing of white birch foliage present in seven plots established for the purpose of measuring the impact on trees is shown in Table 1.

Table 1. Summary of skeletonizing by the birch skeletonizer in four districts in 1972 and 1973 (based on the detailed examination of 10 tagged trees at each location)

Location	Avg DBH of trees (in.)	Skeletonizing (%)	
		1972	1973
Nipigon District			
Orient Bay, south	3	90	90
Geraldton District			
Caramat	3	10	5
Kimberly-Clark pit, Hwy 17	5	10	5
Goldfield Road	6	75	20
Terrace Bay District			
Terrace Bay, north	4	90	60
Hearst District			
Mooseland Resort	7	8	10
Nagagamisis Lake	8	3	2

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

Infestations of the large aspen tortrix, which reached outbreak proportions throughout most of the Region in 1972, showed a partial collapse over extensive areas in the Cochrane, Kapuskasing and Hearst districts in 1973. Infestation trends varied in Nipigon, Geraldton and Terrace Bay districts. Intensities decreased considerably in a band east of Lake Nipigon, increased generally to heavy intensity along Lake Superior, and remained at high levels north of Lake Nipigon to the Ogoki watershed and southeast in a narrowing band to Geraldton and Longlac (see Appendix, Fig. A2). Infestations were heavy in the area east of Oba, in the Hearst-Mattice area, and in a third area in the Hearst District south of Nagagami Lake that extended into Terrace Bay District. Pockets of medium-to-heavy infestation occurred in trembling aspen (*Populus tremuloides* Michx.) stands in over half of the Timmins District (extending northeast to Lake Abitibi in Cochrane District) and in a large area south of Kapuskasing and Smooth Rock Falls. Seven small areas of heavy infestation were mapped at widely scattered points elsewhere in the Region.

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 information report by G. M. Howse *et al.* (O-X-193). This report provides complete description and analysis of developments in the spruce budworm situation in Ontario in 1973 and gives infestation forecasts for the Province for 1974.

Larch Casebearer, *Coleophora laricella* (Hbn.)

Moderate defoliation occurred for the second consecutive year in a small stand of tamarack (*Larix laricina* [Du Roi] K. Koch) near Remi Lake in Kapuskasing District. Population levels remained low at two sample points in Cochrane District (Table 2). Elsewhere in the Region the larch casebearer was observed rarely.

European Spruce Sawfly, *Diprion hercyniae* Htg.

Population levels of the European spruce sawfly in Nipigon, Terrace Bay and Cochrane districts were low and comparable to those of 1972 (Table 3). Larvae in mat samples were found on white spruce (*Picea glauca* [Moench] Voss) in the Hearst and Terrace Bay districts more commonly than in recent years.

Table 2. Summary of larval counts of the larch casebearer in two districts in 1972 and 1973 (Counts were based on the examination of sixteen 18-inch branch tips at each location.)

Location	Avg DBH of trees (in.)	Total no. of larvae counted	
		1972	1973
Kapusksasing District			
Fauquier Township	6	82	82
Cochrane District			
Haggart Township	6	16	8
Clute Township	6	50	30

Table 3. Summary of larval collections of the European spruce sawfly on white spruce trees in three districts in 1972 and 1973 (based on 15 tray samples at each location)

Location	Avg DBH of trees (in.)	Avg no. of larvae/tray	
		1972	1973
Nipigon District			
Jackfish Lake	8	0.2	0.6
Firehill Creek	6	0.7	0.4
Nipigon, east	7	0.5	4.0
McComber Township	4	1.6	2.2
Nezah	2	3.2	1.6
Terrace Bay District			
Mile 3 Manitouwadge Road	7	-	0.1
Mile 12 Manitouwadge Road	7	-	0.6
Cochrane District			
Homuth Township	6	-	0.2

Birch Leafminer, *Fenusa pusilla* (Lep.)

This introduced leafminer has become well established in the Timmins and Cochrane districts and in 1973 continued its spread to the west. Pockets of medium infestation were found on small white birch trees in the southwestern parts of Nipigon and Terrace Bay districts, and on scattered trees along the Gurney Road in O'Brien Township in Kapuskasing District.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

The heavy infestation of 1972 in the Savoff River area increased in intensity in 1973 and spread westward into Boyce, Bicknell and Bell townships in the Geraldton District and eastward as far as Kendall Township in the Hearst District (see Fig. 1). The other infestation reported in 1972 decreased in size and was limited to a small stand of mature trees at Mile 13 on the Onaman Lake Road where the defoliation was heavy. The decrease in size was accounted for by light frost which occurred nightly for a week after the larvae had hatched, thus delaying the opening of the buds. In the interval the small forest tent caterpillar larvae dried out and were blown away. A new infestation covering about 50 square miles in Walters and Leduc townships occurred towards the centre of a larger light infestation between Beardmore and Longlac. Other light infestations were recorded in Fauquier Township, Kapuskasing District and in German Township, Timmins District.

Dissection of cocoons at four locations indicated that on the average 50% of the late larval and pupal population gave rise to adult moths (Table 4). Egg surveys suggest that infestations will continue generally at increased intensity in 1974 (Table 5). Infestations of the forest tent caterpillar have persisted in this Region for 3 years and the indications are that if spring weather should be favourable to the insect for another year or two, a major outbreak would occur.

Table 4. Summary of forest tent caterpillar cocoon dissections in two districts in 1973 (based on the examination of 100 cocoons at each location)

Location	Successful adult emergence (%)	Parasitized (%)	Unexplained mortality (%)
Nipigon District			
Nezah	54	38	8
Jellicoe	48	31	21
Hearst District			
Savoff River	41	43	16
Hearst, 10 miles west	58	23	19

Table 5. Summary of forest tent caterpillar egg-mass counts in 1973 and infestation forecasts in six districts for 1974

Location	Avg DBH of trees (in.)	No. of trees sampled	Avg no. of egg masses per tree	Infestation forecast for 1974
Nipigon District				
Onaman River	10	3	18	medium
Humboldt Bay Road	6	3	0	nil
McComber Twp	7	3	16	heavy
Walters Twp	5	1	37	heavy
Leduc Twp	9	1	46	heavy
Geraldton District				
Ashmore Twp	6	3	0	nil
Hearst District				
McMillan Twp	15	3	25	medium
Stoddart Twp	8	4	43	heavy
Lowther Twp	11	1	12	medium
Shuell Twp	10	1	187	heavy
Way Twp	6	3	9	heavy
Kapuskasig District				
Fauquier Twp	6	6	1	light
Shackleton Twp	6	6	0	nil
Cochrane District				
Calder Twp	8	3	0	nil
Lamarche Twp	6	3	0	nil
Timmins District				
German Twp	6	3	2	medium

White Pine Weevil, *Pissodes strobi* (Peck)

The incidence of damaged leaders was moderate in a small stand of lodgepole pine (*Pinus contorta* Dougl.) and on regeneration white spruce and black spruce (*Picea mariana* [Mill.] B.S.P.) trees in O'Meara Township, Geraldton District. Leader damage was common on young spruce trees east of the Pagwachuan River in the Hearst District and at several locations in Kapuskasing and Cochrane districts. Counts made at five locations in the eastern part of the Region showed little change from 1972 in the incidence of weeviling (Table 6).

Table 6. Summary of leader damage caused by the white pine weevil in two districts in 1972 and 1973. (Counts were based on the examination of 100 trees at each location.)

Location	Host	Avg height (ft)	Trees weeviled (%)	
			1972	1973
Cochrane District				
Potter Twp	wS	6	2	2
Calder Twp	bS	6	3	2
Kapuskasig District				
Fauquier Twp	bS	6	3	1
Casselma Twp	bS	5	2	4
Gurney Twp	bS	6	-	3

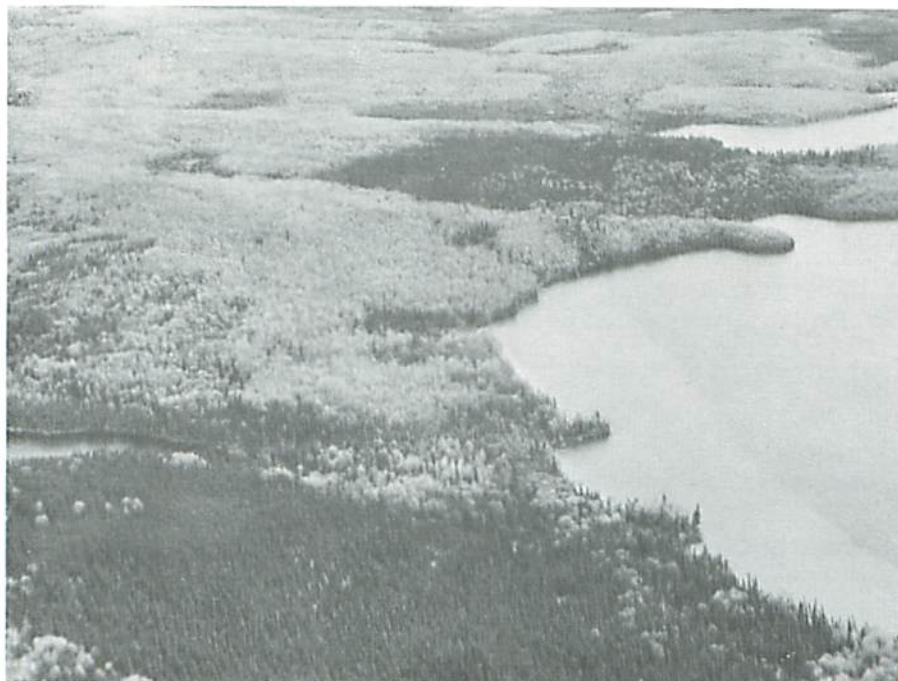


Figure 1. Aerial view showing severe defoliation of trembling aspen caused by the forest tent caterpillar.

Larch Sawfly, *Pristiphora erichsonii* Htg.

In recent years populations of the larch sawfly have generally declined to low levels. However, in 1973 medium defoliation was evident in a few small stands 40 miles east of Langlac in Geraldton District, and in several areas north of Onaman Lake in Nipigon District. Population levels were low or trace elsewhere in the Region.

Mountain-ash Sawfly, *Pristiphora geniculata* Htg.

Medium-to-high numbers of the mountain-ash sawfly occurred in the southeast corner of Terrace Bay District, in the Lukinto and Pagwachuan lakes areas in the Geraldton District, and in scattered areas across Kapuskasing and Cochrane districts. Isolated colonies that occurred in Kipling Township, Kapuskasing District constitute a new northern distributional record for this insect in Ontario.

Poplar Black-mine Beetle, *Zeugophora abnormis* Lec.

Severe frosts between June 9 and 11 caused a major reduction in numbers in 1972. However, survival of all stages of the first generation was high in 1973 and numbers began to rebound. Damage was light in the second generation during August at Terrace Bay, Pagwachuan Lake and Onaman River.

Table 7. Other forest insects

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern.	wS, bF	Light infestation near Heron Bay in 1972 declined to trace in 1973.
<i>Anoplonyx luteipes</i> Cress.	tL	a few larvae in beating samples in the Beardmore to Longlac area
<i>Archips cerasivoranus</i> (Fitch)	ecCh	general reduction from heavy to light
<i>Coleophora betulivora</i> McD.	wB	trace population at several points
<i>Conophthorus banksianae</i> McPherson	jP	medium population near Porquis Junction in Cochrane District

(continued)

Table 7. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Diorycetria reniculella</i> Grt.	wS	light at several points in Geraldton and Cochrane districts
<i>Gonioctena americana</i> (Schaeef.)	tA	medium on a few trees at Toronto and Lucy lakes in Geraldton District and at scattered points in Kapuskasing and Cochrane districts
<i>Hemichroa crocea</i> (Four.)	Al, wB	severe defoliation along creeks and lakeshores from Remi Lake in Kapuskasing District to Calder Township in Cochrane District
<i>Hylemyia planipalpis</i> Stein.	wS	light on spruce cones at Longlac
<i>Hyllobius warreni</i> Wood	jP	light in O'Meara Twp, Geraldton District
<i>Laspeyresia youngana</i> Kft.	wS	light on ornamentals at Longlac
<i>Lithocolletis nipigon</i> Free.	bPo	heavy on young trees at Savoff River; medium at Otasawaian River and O'Brien Twp in Hearst and Kapuskasing districts, respectively
<i>Lithocolletis ontario</i> Free.	tA	Populations increased to medium and high at many points in Geraldton, Terrace Bay, Hearst, Kapuskasing and Cochrane districts
<i>Malacosoma californicum pluviale</i> Dyar	pCh, W	light in the area south and west of Longlac to Lake Nipigon
<i>Micurapteryx</i> sp.	W	heavy west of Hearst to Longlac and Nakina and in the Onaman River-Frank Lake area

(continued)

Table 7. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Neodiprion abietis</i> complex	bF, wS, bS	slight increases with light populations east of Marathon to White Lake
<i>Neodiprion pratti banksianae</i> Roh.	jP	light in Ashmore Twp, Geraldton District
<i>Neodiprion virginianus</i> complex	jP	a few colonies in McComber and Clergue twp in Nipigon and Timmins districts, respectively
<i>Petrova albicapitana</i> (Busck)	jP, lP	light on lodgepole pine at two points in O'Meara Twp, Geraldton District and on jack pine elsewhere
<i>Pheosia rimosa</i> Pack	tA	adults common in light trap at Remi Lake, Kapuskasing District
<i>Phyllocolpa agama</i> (Roh.)	Narrow- leafed W	heavy on a few trees at Pagwachuan and Parks lakes
<i>Pikonema alaskensis</i> (Roh.)	wS, bS	light to heavy on ornamentals in the western and light in the eastern part of the Region
<i>Pikonema dimmockii</i> (Cress.)	wS, bS	small numbers at widely scattered points
<i>Pineus strobi</i> (Htg.)	wP	light in Kettle Lakes Park, Cochrane District
<i>Pityokteines sparsus</i> Lec.	bF	as in 1972, most newly dead or dying balsam fir trees were attacked by this bark beetle
<i>Pleroneura borealis</i> Felt	bF	medium at many points in Geraldton District
<i>Profenusa thomsoni</i> (Konow)	wB	trace levels in Geraldton District
<i>Rhabdophaga swainei</i> Felt	wS, bS	light at widely scattered points

(continued)

Table 7. Other forest insects (concluded)

Insect	Host(s)	Remarks
<i>Rhyacionia adana</i> Heinr.	jP	populations reduced to trace levels by late frosts in 1972 in the western sections of the Region
<i>Rhyacionia busckana</i> Heinr.	jP	similar reductions by frost in 1972 as in <i>R. adana</i> Heinr.
<i>Zeiraphera canadensis</i> Mut. and Free.	wS	light at a few points
<i>Zeiraphera destitutana</i> (Walker)	wS	a few larvae in tray samples
<i>Zeiraphera fortunana</i> Kft.	wS	a few larvae in tray samples

TREE DISEASES

Note: In this section of the report, incidence refers to the proportion of trees infected and level of infection refers to the disease severity.

Dwarf Mistletoe, *Arceuthobium pusillum* Pk.

Infection levels were high 3 miles west of Flynn Lake in the Geraldton District, in pockets along Highway 11 from Fraser to Nagagami rivers in Hearst District, and in Buchan and Kipling townships in Kapuskasing District. Elsewhere damage by this pathogen was observed rarely. Except for along the Mattagami River in Kipling Township, high infection levels were restricted to pockets of black spruce on extremely wet sites where growth is slow.

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

Intensive surveys for root and butt rot diseases have shown that Armillaria root rot is active in coniferous and deciduous stands throughout the Region. Subsequent evaluations show that the disease attacks a wide variety of tree sizes and hosts. The most serious damage has been the killing of black spruce in plantations within the Spruce Falls Power and Paper Company limits in the Kapuskasing District and regeneration and planted jack pine (*Pinus banksiana* Lamb.) trees in Geraldton and Timmins districts. Moderate mortality was observed in small plantings of lodgepole pine in O'Meara Township, on pole-sized black spruce and white spruce trees at Lydia Lake in Geraldton District, and on young white spruce trees in Homuth Township in Cochrane District (Table 8).

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

Needle rusts which are capable of causing severe damage to young spruce stands showed signs of appreciable increase in two eastern districts but decreased to low levels in the western parts of the Region. Infection levels were severe in about 100 acres of regeneration black spruce in Dargavel and Bradburn townships, Cochrane District, and in Shearer Township, Kapuskasing District. Trace-to-light infection levels were recorded at seven other scattered locations in the Region (Table 9).

Table 8. Summary of damage by Armillaria root rot in five districts in 1973

Location	Tree species	Area affected (acres)	Incidence and level of infection (%)	Tree mortality (%)	Stand type
Nipigon District					
Frank Lake	jP	100	3	3	planted
Humboldt Bay	jP	50	3	3	planted
Geraldton District					
Lydia Lake	bS	40	20	10	natural
O'Meara Twp	bS	10	30	20	planted
O'Meara Twp	lP	1	5	5	planted
Mile 52					
Goldfield Road	jP	100	14	14	planted
Kapuskasig District					
O'Brien Twp	bS	1	8	5	planted
Stringer Twp	bS	100	20	15	planted
MacVicar Twp	bS	400	5	0	planted
Cochrane District					
Homuth Twp	wS	-	20	15	natural
Sydere Twp	wS	-	5	3	natural
Timmings District					
Sheraton Twp	jP	20	10	10	planted

Table 9. Summary of incidence and infection levels of needle rusts of spruce in five districts in 1973

Location	Tree species	Estimated incidence	Level of infection
Nipigon District			
Parks Lake	wS	moderate	light
Black Sand Park	wS	moderate	trace
Geraldton District			
Wintering Lake	wS	high	light
Oakes Twp	wS	moderate	trace
Murky Creek	wS	moderate	trace

(continued)

Table 9. Summary of incidence and infection levels of needle rusts of spruce in five districts in 1973 (concluded)

Location	Tree species	Estimated incidence	Level of infection
Terrace Bay District			
Marathon	wS	high	light
Neys Park	bS	high	light
Jackfish Lake Tower	wS	high	light
Camp 56, American Can Co.	bS	high	light
Kapusksasing District			
Teetzel Twp	bS	light	light
Shearer Twp	bS	high	moderate
Cochrane District			
Dargavel Twp	bS	high	moderate
Bradburn Twp	bS	high	high

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

Infection levels of this disease were severe at three locations in Kapuskasing District and at two locations in Timmins District. Light infection levels were recorded at several points in Geraldton, Nipigon and Hearst districts (Table 10). Elsewhere in the Region infection levels on trembling aspen trees were generally rated as trace.

A Needle Rust of Jack Pine, *Coleosporium asterum* (Diet.) Syd.

This foliage disease which occasionally occurs at high levels of infection in young jack pine stands has seldom caused more damage than the slowing of growth in the Northern Survey Region. Infection levels in 1973 were high in a small plantation of jack pine in Avon Township in Cochrane District, in a lodgepole pine plantation in O'Meara Township in Geraldton District, and in jack pine regeneration in Kipling Township in Kapuskasing District. Trace infection levels were observed at three other locations (Table 11).

Table 10. Summary of incidence and infection levels of the ink spot disease on trembling aspen foliage in five districts in 1973

Location	Area affected (acres)	Incidence	Level of infection
Nipigon District			
Beardmore, north	100	high	light
Black Sand Park	200	high	light
Humboldt Bay Road	100	high	light
Geraldton District			
Durer Lake	1000	high	light
O'Sullivan Lake, north	200	moderate	light
Nama Creek	100	high	light
Mile 10 Stevens Road	200	high	light
Hearst District			
Wicksteed Twp	50	high	light
Kapuskasing District			
Buchan Twp	10	high	high
Fauquier Twp	50	high	high
O'Brien Twp	10	high	high
Timmins District			
German Twp	10	high	high
English Twp	-	high	high

Table 11. Summary of incidence and infection levels of a needle rust, *C. asterum*, on pine in four districts in 1973

Location	Host species	Area affected (acres)	Incidence	Level of infection
Nipigon District				
Legault Twp	jP	100	light	trace
Sandra Twp	jP	10	moderate	trace
Geraldton District				
Mile 24 Chipman Road	lP	20	high	high
Mile 10 Stevens Road	jP	200	light	trace
Kapuskasing District				
Kipling Twp	jP	500	high	high
Cochrane District				
Avon Twp	jP	100	high	high

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

Moderate-to-high infection levels of the sweetfern blister rust occurred on jack pine trees along gravel eskers from Lipsett Lake in Timmins District to the Nellie Lake area in Cochrane District. These and other severe infections which have persisted for more than a decade along the Texas Gulf Road north of Timmins have caused little tree mortality in the older stands. However, moderate infection levels in Geraldton and Terrace Bay districts have caused light tree mortality in regeneration and young plantations (Table 12).

Table 12. Summary of incidence, infection level and current tree mortality caused by the sweetfern blister rust in four districts in 1973

Location	Host species	Area affected (acres)	Incidence	Level of infection	Current mortality (%)
Geraldton District					
Mile 24 $\frac{1}{2}$					
Chipman Road	lP	50	moderate	moderate	4
Mile 39 $\frac{1}{2}$					
Goldfield Road	jP	200	moderate	moderate	0
Exton Twp	jP	50	light	light	2
Mile 76					
Catlonite Road	jP	200	moderate	moderate	2
Terrace Bay District					
Marathon	jP	5	moderate	moderate	2
Cochrane District					
Calvert Twp	jP	25	moderate	moderate	0
Aurora Twp	jP	6400	moderate	moderate	0
Timmins District					
Whitney Twp	jP	30	moderate	moderate	0
Sheraton Twp	jP	25	high	high	0
German Twp	jP	25	moderate	moderate	0
Mountjoy Twp	jP	500	moderate	moderate	0

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

The incidence and infection levels of this rust on jack pine remained high in 1973 in the Nezah area in the Nipigon District, and were generally trace-to-moderate in the surrounding Beardmore-Jellicoe

area. Moderate infection occurred in Bain and Exton townships, Geraldton District, in Marathon Township, Cochrane District, and in Adams Township, Timmins District (Table 13).

The disease caused light tree mortality in pockets of regeneration and planted stands in Bain Township, particularly in the vicinity of older infected trees that were left standing after cutting operations. A more serious threat to the stand occurred in areas where the disease was associated with attack by *Scleroderris* canker of pine. Trees up to 2 feet in height and under attack by both pathogens usually die.

Table 13. Summary of incidence, infection level and current tree mortality caused by the gall rust of hard pines in five districts in 1973

Location	Area affected (acres)	Incidence	Level of infection	Mortality (%)
Nipigon District				
Nezah	50	high	high	10
Summers Twp	10	moderate	moderate	5
Legault Twp	100	moderate	light	0
Geraldton District				
Caramat, east 10 miles	100	light	light	0
Mile 76 Catlonite Road	50	light	light	0
Bain Twp	1000	light	moderate	5
Exton Twp	1000	high	moderate	5
Hearst District				
Farquhar Twp	10	trace	trace	0
Cochrane District				
Marathon Twp	100	moderate	moderate	0
Steele Twp	50	moderate	light	0
Timmins District				
Adams Twp	5	moderate	moderate	2
Macklem Twp	10	moderate	light	0

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

Infection levels of *Scleroderris* canker of pine were greatly reduced at most sample points, and fruiting of the disease that was

generally abundant in the previous year was often difficult to find in 1973. Several small new infections were found but none were designated as hot spots where planting of susceptible pines should be restricted.

A total of 63 evaluations have been made in jack pine and red pine (*Pinus resinosa* Ait.) stands to aid in assessing the status of the disease, and two important aspects of the disease stand out. Most of the damage caused by the disease has been in regeneration and plantation stands, whereas well-stocked older stands are nearly disease free. Secondly, most stands attacked by the disease have passed the age class during which tree mortality is likely to occur.

The most serious damage occurred in a small area near Cosgrave Lake in Nipigon District. Infection levels were trace to light in more extensive areas in the Onaman River-Frank Lake and Sandra Township areas (Table 14).

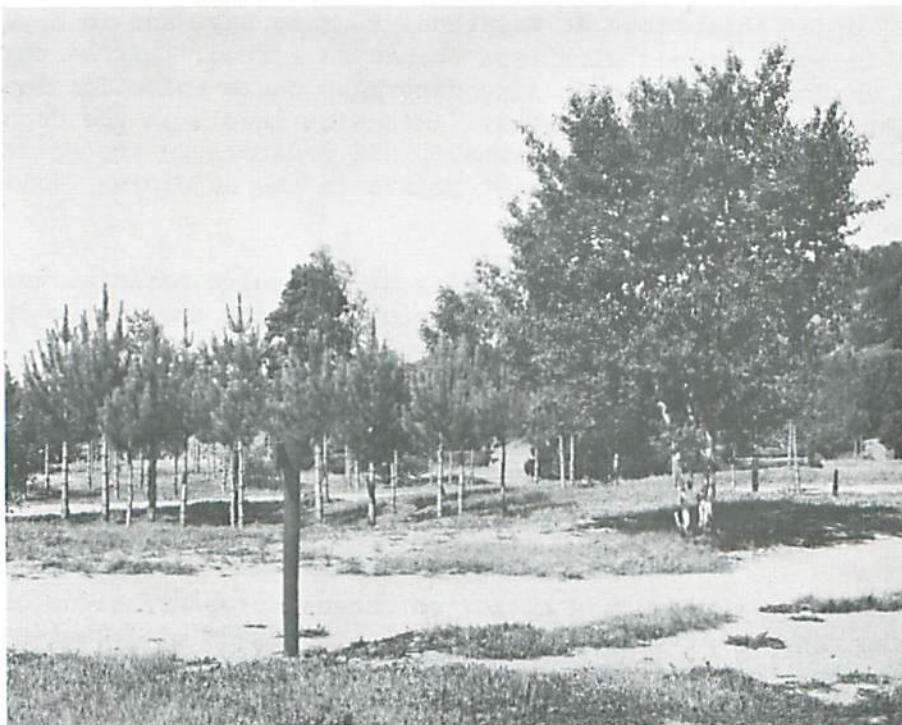
In Geraldton District pockets of high infection occurred in plantation and regeneration jack pine stands in Bain Township, and appreciable tree mortality was observed. Other infection levels were moderate in large areas in the vicinity of Lucy Lake and the Longlac Nursery.

High infection in recent years in the Manitouwadge-Hillsport roads area in Terrace Bay District was generally reduced to light levels in 1973. Other infections at Marathon, Terrace Bay, and in Neys Park occurred in small stands with less chance to spread. Little change occurred in Hearst and Kapuskasing districts where infection levels were light in several small areas. Infection levels in the Cochrane District were high in Stimson Township and moderate in the Nellie Lake area, and were moderate to high at points in the adjoining Timmins District.

Control by reducing the amount of inoculum material was carried out at Kettle Lakes Park, Timmins District and in the Spruce Falls Nursery, Kapuskasing District, and a test control was instigated on red pine trees in Neys Park, Terrace Bay District. Figures 2 and 3 show the contrast of before-and-after sanitation operations at Neys Park. All small trees were removed and the lower whorls of larger trees cut off to a height of $4\frac{1}{2}$ feet.

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

Emphasis in 1973 was placed on extensive observations of the occurrence and impact of Hypoxylon canker in stands of trembling aspen in the western half of the Survey Region. Numerous young stands examined on Domtar, Abitibi and Kimberly-Clark limits showed little evidence of this disease. In general, instances of moderate or severe disease were in stands on poor sites which were either overmature or in the process of natural thinning. These are summarized in Table 15.



Figures 2 and 3. Portion of Neys Provincial Park, Terrace Bay District before (above) and after (below) sanitation pruning.

Table 14. Summary of incidence, infection levels, and potential areas of damage by *Scleroderris* canker of pine in the seven districts in 1973

Location	Host species	Incidence	Level of infection	Susceptible area (acres)
Nipigon District				
Humboldt Bay Road	jP	light	light	5000
Cosgrave Lake	jP	high	high	200
Sandra Twp	rP	moderate	trace	10
Geraldton District				
Bain Twp	jP	moderate	high	3000
Lucy Lake	jP	moderate	moderate	5000
Longlac Nursery	jP, rP	moderate	moderate	500
Margo Lake	jP	high	moderate	500
Terrace Bay District				
Terrace Bay	jP	light	light	3000
Marathon	jP	moderate	light	200
Neys Park	rP	moderate	moderate	100
Hearst District				
Gill Twp	rP	light	light	50
Studholme Twp	rP	moderate	light	200
Wicksteed Twp	rP	light	light	100
Kapuskasing District				
Spruce Falls Nursery	jP	trace	trace	50
Parnell Twp	rP	trace	trace	--
Gurney Twp	jP	trace	trace	50
Kipling Twp	jP	trace	trace	500
Cochrane District				
Fournier Twp	rP	nil	nil	--
Stimson Twp	jP	high	high	1000
McCart Twp	rP	moderate	moderate	50
Avon Twp	jP	trace	trace	300
Timmins District				
Sheraton Twp	jP	high	high	1000
Adams Twp	jP	high	high	100
German Twp	rP	moderate	light	100
Macklem Twp	jP	moderate	moderate	10

Table 15. Summary of incidence, infection level and current mortality caused by Hypoxylon canker of poplar in five districts in 1973

Location	Area affected (acres)	Incidence	Level of infection	Current mortality (%)
Nipigon District				
Meader Twp	100	light	light	1
Geraldton District				
Lamaune Lake	1000	light	light	1
Mile 5 Pagwachuan Road	300	moderate	moderate	0
Anaconda Mine	100	trace	trace	0
Hillsport Road	50	moderate	moderate	5
Kapusksing District				
Casselman Twp	200	moderate	moderate	0
O'Brien Twp	200	moderate	moderate	1
Shackleton Twp	50	moderate	moderate	0
Fauquier Twp	300	high	high	5
Cochrane District				
Lamarche Twp	500	high	high	5
Steele Twp	200	moderate	light	0
Timmins District				
Robb Twp	500	high	high	5
Ogden Twp	50	moderate	moderate	0
Tisdale Twp	200	moderate	moderate	7

A Rust on Balsam Fir, *Pucciniastrum epilobii* Otth.

Infection levels of this rust were moderate on balsam fir (*Abies balsamea* [L.] Mill.) along the Chain of Lakes Road in Seaton and Fenton townships, Kapuskasing District, and along the Abitibi Road in Laidlaw and Sydere townships, Cochrane District (Table 16). Infection levels in the Geraldton District were trace, and elsewhere the disease was rarely observed.

Table 16. Summary of incidence and infection level of a rust on balsam fir, *P. epilobii*, in three districts in 1973

Location	Area affected (acres)	Incidence	Level of infection
Geraldton District			
Raynar Twp	100	light	trace
Kapuskasing District			
Seaton Twp	100	moderate	moderate
Fenton Twp	100	high	moderate
Cochrane District			
Laidlaw Twp	50	moderate	moderate
Sydere Twp	50	moderate	moderate

Single-tree Mortality of Balsam Fir

The death of single balsam fir trees in mixed stands in the Pagwachuan Lake area in Geraldton District continued in 1973 at a rate comparable to that of 1972. Three prescribed flight lines were checked again in 1973 by flying at an elevation of 1000 feet using standard markings on a Turbo-jet Beaver aircraft to view continuously a strip 1000 feet wide. All red-needled balsam fir trees were counted. The counts for both years, converted to total numbers of newly dead trees per 100 acres, and estimates of cumulative mortality are shown in Table 17. A scarcity of red-needled trees early in the summer of 1973 indicated that most of the trees counted in 1972 had lost their needles; hence, the majority of those counted in 1973 were newly dead trees. The intensities of newly dead trees and estimates of cumulative mortality in the Pagwachuan Lake flight lines were then used as guides to assess the amounts of similar balsam fir mortality elsewhere in the Region.

Other areas in the Geraldton District, in which additional new mortality occurred, were in the vicinities of Slim Jim, Loughlan and Meta lakes, southeast of Beardmore in the Kinago Lake area in Nipigon District, and in the area north of Marathon in Terrace Bay District. Although single-tree balsam fir mortality was observed in Hearst, Kapuskasing, Cochrane and Timmins districts the accumulation of dead trees was not serious.

The primary factor in the mortality of balsam fir has been the weakening of the trees by a variety of root rots which predisposes them to attack by the balsam fir beetle, *Pityokteines sparsus* Lec. Badly weakened trees examined to date indicate that the appearance of red

needles in midsummer coincides closely with heavy attack by the adult beetle or the successful establishment of larval colonies.

Table 17. Summary of current balsam fir mortality and estimates of cumulative old mortality in the Geraldton District in 1972 and 1973

Location	Proportion of spruce-fir type in flight (%)	Length of line (miles)	Total number of newly dead trees per 100 acres		Estimated intensity of old mortality in 1973
			1972	1973	
Pagwachuan Lake, south	75	3	29	27	moderate
Pagwachuan Lake, west	60	6	10	9	light
McKay Lake, north	50	4½	9	6	light

Wind Damage

A severe windstorm on June 30, 1973 caused damage extending in a wide swath from Lake Nipigon across the northern portions of Nipigon, Geraldton, Terrace Bay and Hearst districts to the Remi Lake-Chain of Lakes area in Kapuskasing District (Table 18). In general the damage was sporadic, often affecting a small number of trees at scattered points in a stand. All species were affected to some extent but black spruce and trembling aspen were the species most affected. Breakage of tree trunks was particularly common in mature-to-overmature stands of trembling aspen.

The most severe damage occurred in Boyce and Bell townships in the Pagwachuan River area in Geraldton District where salvage operations were considered, and in several areas in Kapuskasing District. In general damage was made more serious by its occurrence in extensive stands of near marginal value for commercial operations.

Table 18. Summary of damage caused by windstorms in four districts in 1973

Location	Description of damage	Level of damage
Nipigon District		
Onaman Lake, north	Small but numerous pockets of downed trees	high
Lake Nipigon, east	Scattered single trees and a few groups of trees	light
Geraldton District		
Nakina, south	Scattered small areas or groups of trees	moderate
Klotz Lake	Single trees or small groups of trees	light
Pagwachuan River	Scattered small areas	moderate
Boyce Twp	Numerous small-to-large areas	high
Bell Twp	Numerous small-to-large areas	high
Hearst District		
Pagwa to Hornepayne Road	Scattered individuals with some groups	light
Nagagamisis Lake	Small groups or pockets	moderate
Mooseland Resort	Small groups	moderate
Kapuskasig District		
Puskuta Twp	Narrow bands of trees	high
Champlain Twp	Pockets and narrow bands	high
Cluston Twp	Many small but scattered pockets	high
Fauquier Twp	Small groups of trees	moderate

Table 19. Other forest diseases

Organism	Host(s)	Remarks
<i>Apiosporina collinsii</i> (Schw.) Hoehn.	Ser	trace levels at many points
<i>Chrysomyxa arctostaphyli</i> Diet.	bS	light near Pays Plat and trace at several points in the Region
<i>Cronartium coleosporioides</i> Arth.	jP	light in Exton and Pic twp in Geraldton and Terrace Bay districts

(continued)

Table 19. Other forest diseases (continued)

Organism	Host (s)	Remarks
<i>Cronartium comandrae</i> Pk.	jP	high in Avon Twp, low in Kipling Twp (both in Cochrane District), and light in Legault Twp, Geraldton District
<i>Cronartium ribicola</i> J.C. Fischer	wP	high with some tree mortality in Sandra Twp and light in southwest part of Nipigon District; moderate in Studholme Twp, Hearst District, and light in Fauquier Twp, Kapuskasing District
<i>Cytospora pini</i> Desm.	jP	trace levels at Mile 52 Goldfield Road, Geraldton District
<i>Davisomycella ampla</i> (Davis) Darker	jP	trace levels near Caramat and at Humboldt Bay Road
<i>Dasycypha acuum</i> (Alb. & Schw.) Sacc.	jP	trace infection in Nakina Twp
<i>Gymnosporangium cornutum</i> Arth. ex Kern	moAs	light infection at Heron Bay
<i>Melampsorella caryophyllacearum</i> Schroet.	bF	light infection at Lukinto Lake and Black Sand Park in Geraldton and Nipigon districts; trace near Ryland, Kapuskasing District
<i>Pollaccia elegans</i> Serv.	bPo	trace at several locations in Geraldton District
<i>Pollaccia radiosa</i> (Lib.) Bald. & Cif.	tA	light at a few points
Frost Damage	tA, bF	Late frosts in the Onaman River-Frank Lake area in Nipigon District caused late opening of aspen foliage and starvation of forest tent caterpillar larvae, and later killed 1-inch shoots of balsam fir trees.

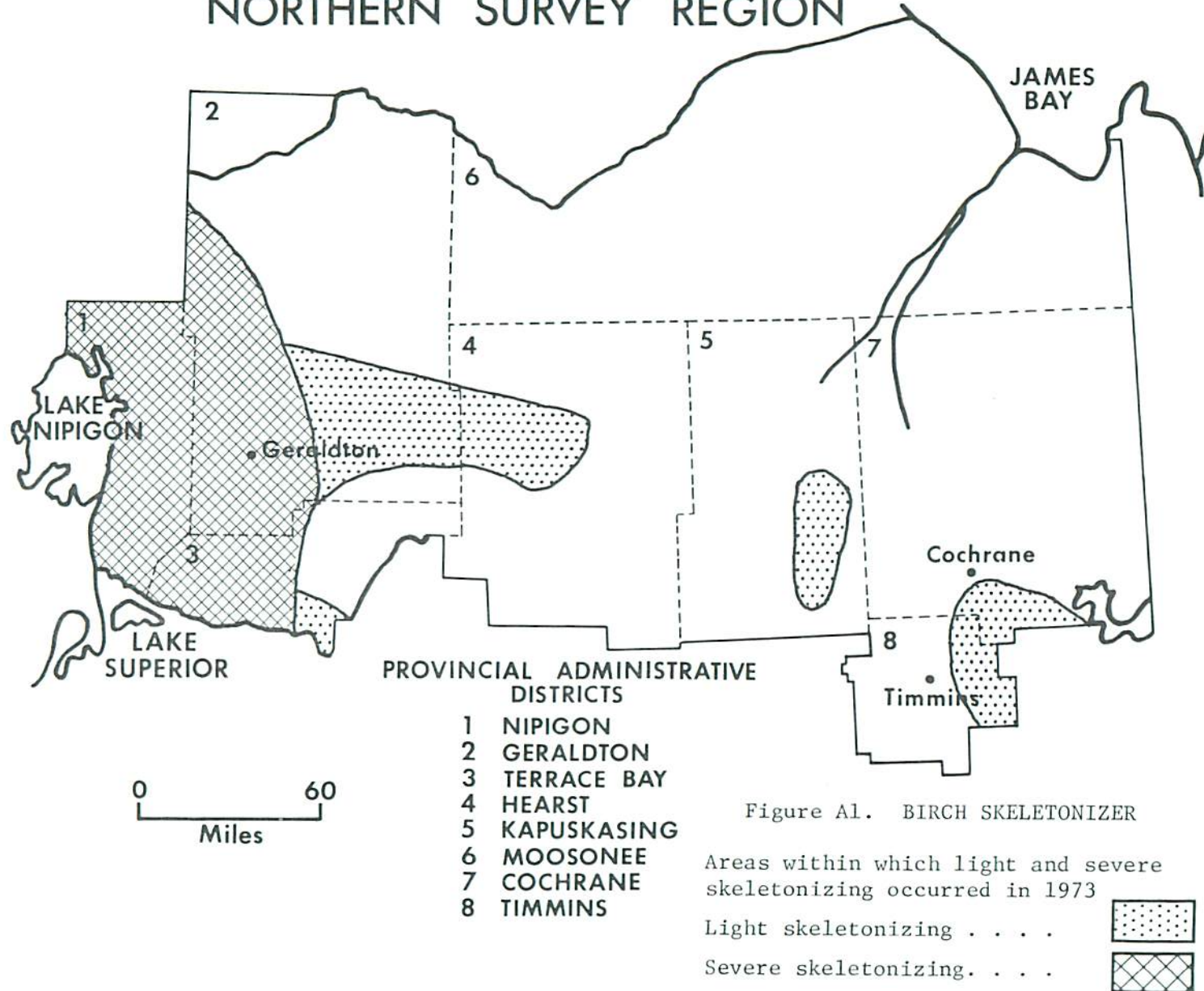
(continued)

Table 19. Other forest diseases (concluded)

Organism	Host(s)	Remarks
Winterburn	jP, lP, rP	moderate on hybrid jack pine near Hillsport and on lodgepole pine in O'Meara Twp, Geraldton District; light on red pine and jack pine at several points in the Region

APPENDIX

NORTHERN SURVEY REGION



NORTHERN SURVEY REGION

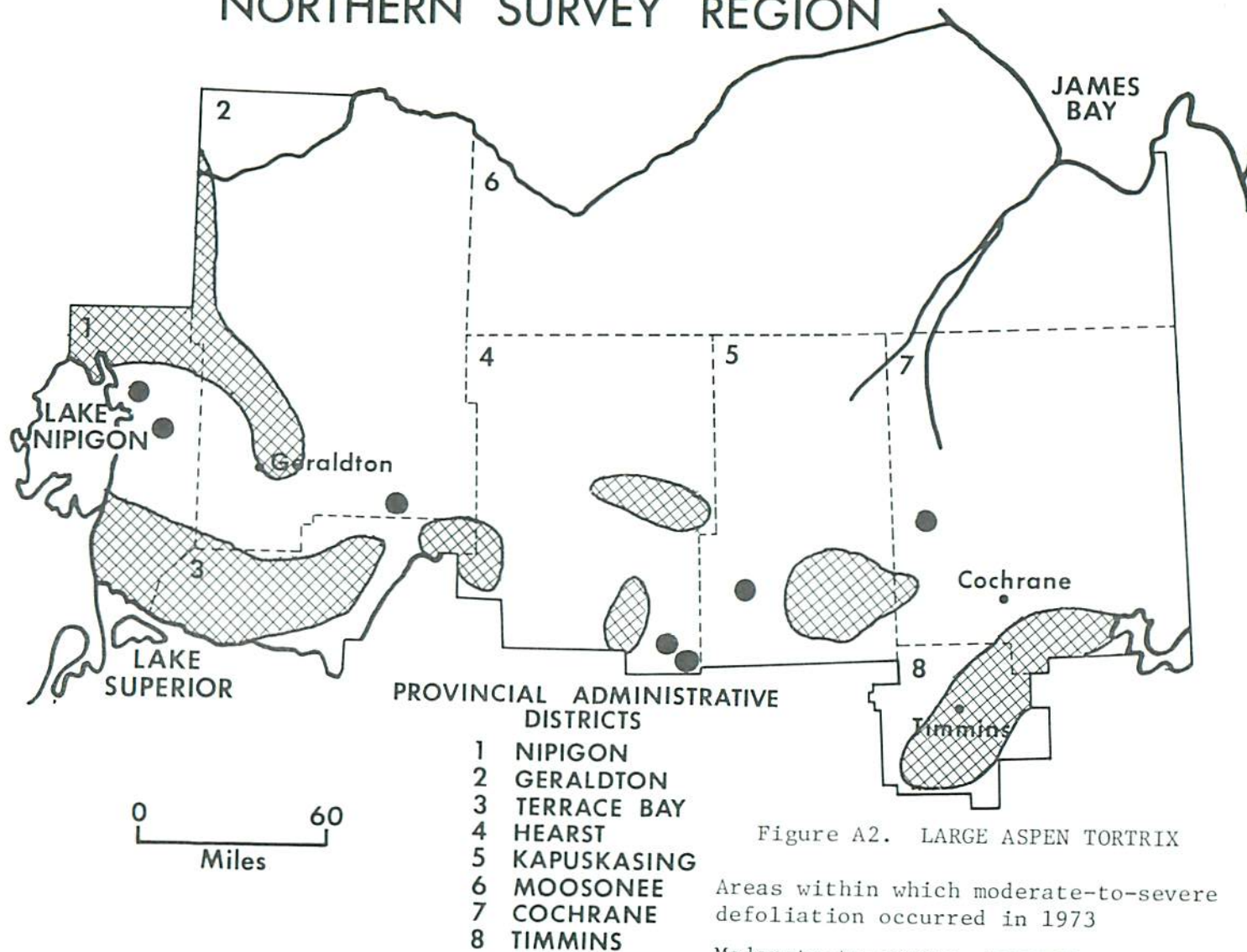



Figure A2. LARGE ASPEN TORTRIX

Areas within which moderate-to-severe defoliation occurred in 1973

Moderate-to-severe defoliation  or 