

FOREST INSECT AND DISEASE SURVEYS
IN THE NORTHERN SURVEY REGION, 1972

(FOREST DISTRICTS: COCHRANE, KAPUSKASING, AND GERALDTON)

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INFORMATION REPORT O-X-178

CANADIAN FORESTRY SERVICE

DEPARTMENT OF THE ENVIRONMENT

APRIL 1973



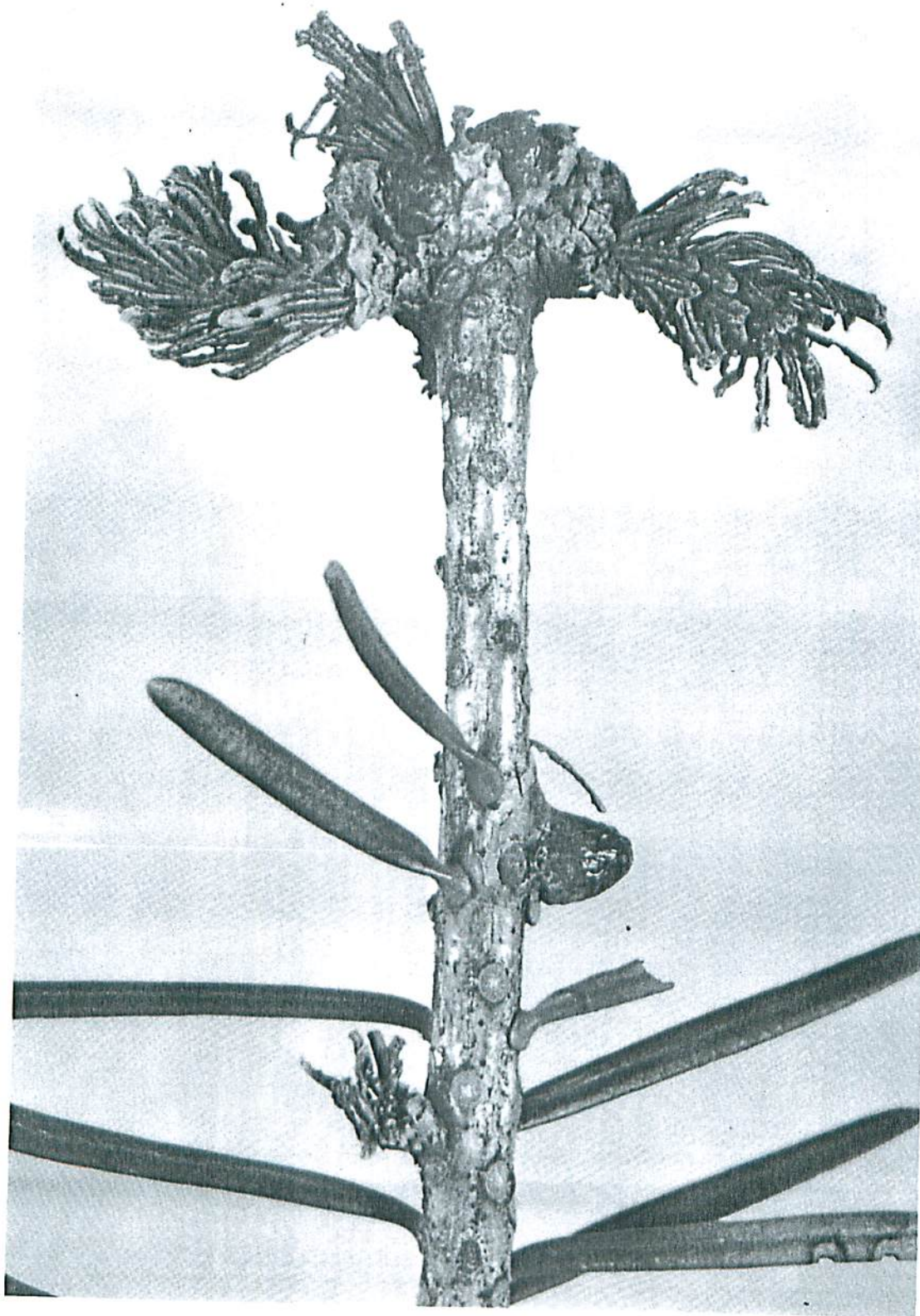
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ACKNOWLEDGEMENT

The authors of this report wish to acknowledge the generous assistance given them by timber operators and personnel of the Ontario Ministry of Natural Resources.

Frost Damage



Frontispiece. Balsam fir shoots killed by frost.

SURVEY HIGHLIGHTS

This report deals with the more important, or potentially important, forest insect and tree diseases in the Northern Survey Region in 1972.

The spruce budworm, the most important insect, is discussed on a province-wide scale in a separate report. Heavy infestations within the Spruce Falls Power and Paper Company limits in the Kapuskasing District increased from Opasatika Lake to Minnipuka Township. Although egg counts were high again in 1972, severe frost damage to the new shoots of balsam fir and white spruce and subsequent decreases in spruce budworm larval populations may eventually have far-reaching effects on the northeastern Ontario outbreak. Average defoliation estimates made at 25 points in the northwest part of the White River District and southeastern part of Geraldton District declined from 7% in 1971 to less than 2% in 1972 (in spite of higher populations in the early instars and the increases forecast for 1972). Elsewhere in the Geraldton District and in the northern areas of the Kapuskasing and Cochrane districts, spruce budworm numbers were very low.

Population levels of the birch skeletonizer increased in the western half of the Geraldton District and in the Iroquois Falls-Timmins area of Cochrane District but declined to low levels in east Geraldton and Kapuskasing districts. The large aspen tortrix reached outbreak proportions in most of the Region and heavy infestation of the forest tent caterpillar occurred in about 100 square miles in the Savoff River area in the Kapuskasing District. Severe frosts in May and early June had a direct effect on the survival of the spruce budworm, the pine tip moth, the red jack-pine shoot-borer and the poplar black-mine beetle.

Late spring frosts caused the heaviest damage recorded in at least the past decade, erased cone and berry crops and killed high numbers of seedlings among 1971 plantings of black and white spruce. Root and butt rot surveys were expanded in 1972, and considerable single tree balsam fir mortality was observed in almost half of the Geraldton District. Considerable time was spent assessing and outlining Scleroderris 'hot spots', areas in which infection of Scleroderris canker of pine was abundant. Other noteworthy disease problems in the Region included Armillaria root rot in plantations, white pine blister rust, Hypoxylon canker on aspen, and several stem rusts on jack pine.

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INSECTS

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Infestations of this insect decreased from outbreak proportions in 1971 to low intensity in 1972 in the Kapuskasing District and in the eastern half of Geraldton District. However, medium-to-heavy infestation recurred from the Longlac-Nakina area west to Lake Nipigon and spread south in a narrow band to the Nipigon-Kama Bay area and north to the Ogoki watershed (see Appendix, Fig. A1). Elsewhere in the Geraldton District small, heavy infestations occurred in the Marathon area and north of Terrace Bay in an area of about 50 square miles. Infestation intensity increased to heavy in the Iroquois Falls-Timmins area in the Cochrane District but was light in Fauquier Township in the Kapuskasing District. Estimates of foliage damage at seven impact plots in the western half of the Region show the variability present (Table 1).

Table 1. Summary of skeletonizing by the birch skeletonizer in the Northern Survey Region in 1972 (Counts were based on the examination of 10 tagged trees at each location.)

Location	Avg DBH of trees (in.)	Avg skeletonizing/tree (%)
Geraldton District		
Caramat	3	10
Kimberly-Clark, H 11	5	10
Goldfields Road	6	75
Terrace Bay, north	4	90
Orient Bay, south	3	90
Kapuskasing District		
Mooseland Resort	7	8
Nagagamisis Lake	8	3

As a result of very high populations of birch skeletonizer near Caramat in 1971, serious deterioration and dieback of the upper crowns of white birch trees (*Betula papyrifera* Marsh.) were observed in 1972 (Fig. 1). Similar deterioration of white birch trees was observed in cutover areas near Lucy Lake and in the vicinity of Cavell and Nakina.

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

Damage levels increased from small, scattered, heavy infestations in 1971 to an extensive outbreak over large parts of the Geraldton, Kapuskasing and Cochrane districts in 1972 (see Appendix,

Fig. A2). Moderate-to-severe defoliation extended throughout trembling aspen (*Populus tremuloides* Michx.) stands from the Lake Nipigon-Ogoki River area across most of the Region to the Quebec border north of Lake Abitibi and in a narrow band along the north shore of Lake Superior. Elsewhere in the southern part of the Geraldton District the intensity of defoliation was light.

Extremely high populations in some mixed stands resulted in the stripping of trembling aspen and subsequently caused light defoliation of adjacent balsam fir (*Abies balsamea* [L.] Mill.).

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.



Fig. 1. Crown deterioration of white birch 1 year after heavy foliage damage by the birch skeletonizer.

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-173). This report provides the reader with a complete description and analysis of developments concerning the spruce budworm situation in Ontario in 1972 and gives infestation forecasts for the Province for 1973.

Larch Casebearer, *Coleophora laricella* (Hbn.)

For the second consecutive year, moderate defoliation caused by this casebearer occurred in Fauquier Township in the Kapuskasing District. Little change was recorded in the Cochrane District at two quantitative sample locations (Table 2).

Table 2. Summary of larval counts of the larch casebearer in the Northern Survey Region in 1972 (Counts were based on the examination of sixteen 18-in. branch tips at each location.)

Location (Twp)	Avg DBH (in.)	Total no. of larvae collected	
		1971	1972
Kapuskasing District			
Fauquier	6	80	82
Cochrane District			
Haggart	6	4	16
Clute	6	53	50

European Spruce Sawfly, *Diprion hercyniae* Htg.

Numbers decreased slightly in areas infested longest and tended to increase in the more recently invaded areas east of Beardmore (Table 3). New distribution records were established in Colter and Kilkenny townships.

Table 3. Summary of larval collections of the European spruce sawfly on white spruce trees in the Geraldton District in 1971 and 1972 (based on 15-tray samples at each location)

Location	Avg DBH of trees (in.)	Avg no. of larvae/tray	
		1971	1972
Pic Twp	4	3.2	0.0
Jackfish Lake	8	2.0	0.2
Firehill Creek	6	3.8	0.7
Nipigon, east	7	5.4	0.5
Polly Lake	8	4.2	0.0
McComber Twp ^a	4	0.6	1.6
Summers Twp ^a	5	0.4	0.0
Nezah ^a	2	-	3.2

^a more recently infested areas

Birch Leaf Miner, *Fenusa pusilla* (Lep.)

A medium infestation in the Nipigon-Terrace Bay area in 1971 spread northward in 1972 to a line from Orient Bay east about 20 miles to Owl Lake. Beyond this, light damage occurred in pockets north to Beardmore and east to Geraldton. The birch leaf miner is causing noticeable damage in the southern and eastern parts of the Cochrane District, but in the Kapuskasing District numbers were relatively low.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Populations that showed signs of buildup in 1971 increased markedly in a few areas in 1972. Heavy infestation occurred in about 100 square miles in the Savoff River area in the Kapuskasing District, and in a small stand north of Grant in the Geraldton District. Light infestation was detected at five points in the Onaman River area, in Suni and Rupert townships in the Geraldton District, and at several points in German Township in the Cochrane District. Larval populations that had caused notable defoliation were considerably reduced, apparently by the effects of late spring frosts. Sickly looking larvae from the Onaman River areas were examined in the Insect Pathology Research Institute in Sault Ste. Marie, Ontario, but no causal disease organism was found. From a total of 40 cocoons examined in German Township only one moth had emerged. The slow larval development, small size of pupae,

high degree of parasitism and scarcity of cocoons in the defoliated areas also characterized similar situations reported in the Cochrane District in 1964, when severe frosts wiped out incipient populations in Whitney and Tisdale townships.

Egg-mass counts indicate that very high populations can be expected in 1973 in the Savoff River area (Table 4).

Table 4. Summary of forest tent caterpillar egg-mass counts in 1972 and infestation forecasts in the Northern Survey Region for 1973

Location	Avg DBH of trees (in.)	No. of trees sampled	Avg no. of egg masses per tree	Infestation forecast for 1973
Geraldton District				
Humboldt Bay Road	5	10	1.5	light
Onaman River, mile 8	9	3	0.3	light
Kapuskasing District				
Savoff Station, north	7	1	140.0	heavy
Savoff, 2 miles west	4	1	43.0	heavy
Cochrane District				
German Twp	6	3	0.0	nil
White River District				
Manitouwadge Road, mile 3½	4	3	0.3	light

A Leaf Miner on Willow, *Micurapteryx* sp.

This little-known leaf miner on willow (*Salix* sp.) caused severe browning of foliage in Shuell, Clavet and Kohler townships in 1971. The infestation in 1972 spread east to the vicinity of Hearst in the Kapuskasing District, and west along the Canadian National Railway to Nakina in the Geraldton District. Heavy infestation also occurred in the Melchett Lake and Humboldt Bay areas, and light infestations were common in the Longlac-Geraldton-Beardmore area in the Geraldton District.

White Pine Weevil, *Pissodes strobi* (Peck)

Damaged leaders of black spruce (*Picea mariana* [Mill.] B.S.P.), white spruce (*Picea glauca* [Moench] Voss) and jack pine (*Pinus banksiana* Lamb. [= *P. divaricata* (Ait.) Dumont]) were common in the Geraldton District. Severe damage recurred in a small area of lodgepole (*Pinus contorta* Dougl.) and black and white spruce surrounding the plantation in O'Meara Township. In the Cochrane District and eastern part of Kapuskasing District, damage to leaders of black and white spruce was widespread at much the same intensity as in 1971 (Table 5).

Table 5. Summary of leader damage caused by the white pine weevil at five points in Kapuskasing and Cochrane districts (Counts were based on the examination of 100 trees at each point.)

Location (Twp)	Host	Avg height (ft)	Trees weeviled (%)	
			1971	1972
Cochrane District				
Potter	wS	6	2	2
Calder	bS	6	3	2
Kapuskasing District				
Fauquier	bS	6	3	1
Casselman	bS	5	2	3
Gurney	bS	6	-	4

Balsam-fir Bark Beetle, *Pityokteines sparsus* Lec.

Mortality of individual balsam fir trees has increased considerably since 1970 in the Geraldton District. Detailed examination of 20 dying trees showed heavy attack by this bark beetle which commonly attacks weakened balsam fir.

Larch Sawfly, *Pristiphora erichsonii* Htg.

Populations were high 40 miles east of Longlac where the average defoliation was 83% and medium in Leduc and Chipman townships. Elsewhere in the Region population levels were trace to low. Egg densities at several locations in each district were sufficient to cause serious defoliation, but in general the larvae from each colony had fed only on a few needle clusters and disappeared, thus causing less than one quarter of the defoliation expected.

Checks in the Geraldton District for the introduced parasite, *Olesicampe benefactor* Hinz, failed to turn up the parasite, but 20% parasitism by *Bessa harveyi* Tns. occurred in Leduc Township.

Mountain-ash Sawfly, *Pristiphora geniculata* Htg.

High numbers of the mountain-ash sawfly occurred in most of the Cochrane District, in the eastern half of the Kapuskasing District, and in the southeastern corner of the Geraldton District. Elsewhere in the Geraldton District low numbers occurred along Lake Superior and at Pagwachuan and Lukinto lakes. Isolated colonies were observed north of Nipigon to Beardmore and east along Highway 11 to Longlac as this introduced insect continued to spread across the Region.

Pine Tip Moth, *Rhyacionia adana* Heinr.

Shoot mortality of regeneration and plantation jack pine was common in the Kimberly-Clark Power and Paper Company cutover limits in the McKay-McLeod lakes area, in the Humboldt Bay area northeast of Lake Nipigon, and on lodgepole and jack pine trees in O'Meara and Bain townships. Dead larvae were found inside shoots at all four locations, and in the Humboldt Bay area more than half of the larvae were dead after severe frosts. Most dead larvae were found on lower branches where frost was most severe.

Red Jack-pine Shoot-borer, *Rhyacionia busckana* Heinr.

This shoot-boring insect, usually found in small numbers on large open-grown jack pine trees, was common on regeneration and in plantations in 1972. Population levels were moderate on a few trees at mile 76 on the Catlonite Road and low on lodgepole and jack pine in O'Meara Township. A large proportion of the larvae on lower branches were dead after a severe frost.

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

Adult beetles were collected near Terrace Bay in an effort to confirm identification of full-grown larvae reared from known parents. Here too, however, frost apparently caused appreciable mortality among immature stages (Table 6). Varying degrees of egg and larval mortality were observed at several additional locations in the Geraldton District.

Table 6. Summary of poplar black-mine beetle egg and larval mortality in the Geraldton District in 1972

Location	Host	Height of trees (ft)	Egg mortality	Larval mortality
Pagwachuan Lake	bPo	3-6	low	high
Terrace Bay, north	bPo	1-3	high	high
Terrace Bay, north	tA	2-8	low	low
Terrace Bay, north	W	5-8	low	trace
Caramat, north	bPo	6-12	trace	trace
Jackpine River Road	bPo	1-3	high	high

Table 7. Other noteworthy insects

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern.	wS, bF	light infestation near Heron Bay and nine collections from other points, Geraldton District
<i>Anoplonyx luteipes</i> Cress.	tL	light in Daley Twp, Geraldton District
<i>Archips cerasivoranus</i> (Fitch)	ecCh	heavy at several points in the Region
<i>Coleophora betulivora</i> McD.	wB	trace level at Geraldton and Rupert twp
<i>Dioryctria abietivorella</i> Grt.	wS	heavy on cones on ornamentals at Longlac
<i>Dioryctria reniculella</i> Grt.	wS, bF	light on cones near Nipigon, collected on foliage at 11 other locations
<i>Enargia decolor</i> Wlk.	tA	decreased to low levels at Kama Bay and mile 20 on the Hornepayne Road
<i>Gonioctena americana</i> (Schaeff.)	tA	medium in Kowkash and light in Rupert twp
<i>Hemichroa crocea</i> (Four.)	Al, wB	heavy along several creeks in the Cochrane and Kapuskasing districts

(continued)

Table 7. Other noteworthy insects (continued)

Insect	Host(s)	Remarks
<i>Hylobius warrenii</i> Wood	jP, lP	light in O'Meara Twp, Geraldton District
<i>Lambdina fiscellaria</i> <i>fiscellaria</i> Gn.	bF, wS	single larvae collected in Geraldton District
<i>Laspeyresia youngana</i> Kft.	wS	light near Nipigon
<i>Lithocolletis nipigon</i> Free.	bPo	heavy on small trees at Savoff River, Kapuskasing District
<i>Lithocolletis ontario</i> Free.	tA	light to heavy at many points in the Region
<i>Neodiprion abietis</i> complex	bF, wS, bS	low numbers in tray samples at ten points in Geraldton District
<i>Neodiprion pratti banksianae</i> Roh.	jP	light on a few trees in Ashmore, Rupert and Ledger twp in Geraldton District
<i>Neodiprion virginianus</i> complex	jP	light in McComber Twp, Geraldton District, and in Avon and Clute twp in Cochrane District
<i>Petrova albicapitana</i> (Busck.)	lP, jP	light on lodgepole pine at two points in O'Meara Twp, and on jack pine at many points in the Region
<i>Phratora hudsonia</i> Brown	wB	trace near Rossport, Geraldton District
<i>Phyllocalpa agama</i> (Roh.)	Narrow-leaved W	heavy on a few trees at Pawachuan Lake in Geraldton District
<i>Pikonema alaskensis</i> (Roh.)	wS, bS	low levels in Cochrane and Kapuskasing districts and light to high in the Geraldton District
<i>Pikonema dimmockii</i> (Cress.)	wS, bS	a few larvae collected at nine points in the Region
<i>Pineus similis</i> Gill.	wS	heavy on isolated trees in Sandra Twp, light near Nipigon, Geraldton District

(continued)

Table 7. Other noteworthy insects (concluded)

Insects	Host(s)	Remarks
<i>Pineus strobi</i> (Htg.)	wP	heavy at mile 76 on Catlonite Road and in Sandra Twp on planted trees
<i>Pissodes approximatus</i> Hopk.	jP	light at Onaman River and in Bain Twp, Geraldton District
<i>Pityogenes hopkinsi</i> Sw.	jP	light on plantation trees near Frank Lake, Geraldton District
<i>Pleroneura borealis</i> Felt	bF	light to medium at many points in the Region
<i>Profenusa thomsoni</i> (Konow)	wB	reduced to trace and low levels in the Region
<i>Rhabdophaga swainei</i> Felt	wS, bS	light at several points in the Region
<i>Zeiraphera canadensis</i> Mut. and Free.	wS	light at several points in Geraldton District
<i>Zeiraphera destitutana</i> (Walker)	wS	a few larvae in tray samples at five points in Geraldton District

TREE DISEASES

Dwarf Mistletoe, *Arceuthobium pusillum* Pk.

Infection levels continued to be high west of Flynn Lake and trace at a few other points in the Geraldton District. In the Kapuskasing District, pockets in which infection levels were high occurred in the Fraser-Nagagami river area, in Buchan Township and north of the Kipling Dam along the Mattagami River. Light mortality of black spruce was observed in the Fraser River area. Little damage was caused by the dwarf mistletoe in the Cochrane District.

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

Armillaria root rot continued as a major cause of mortality in both natural and planted conifer stands in the Geraldton District. For example, the disease caused 1-5% tree mortality in lodgepole pine plantings in O'Meara Township in 1972. Also, light tree mortality occurred in a black spruce plantation in Stringer Township in the Kapuskasing District. The disease has been found most consistently in stand openings of semimature-to-overmature balsam fir, jack pine and black and white spruce trees in the Region.

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

The incidence of needle rusts on black and white spruce remained high at several points in the Geraldton District whereas infection levels dropped from high in 1971 to trace in 1972 at Suckle and Murphy creeks and to low near Camp 56 within the American Can Paper Company limits (Table 8). The trend to lower infection levels was reversed in the Kapuskasing and Cochrane districts where low infection in 1971 increased to moderate in Caithness, Michie and Potter townships and to high in Steele Township.

Ink Spot Disease of Poplar, *Ciborinia whetzelii* (Seaver) Seaver

The incidence and infection levels of the ink spot disease decreased sharply in most of the Region. Moderate infection levels occurred a few miles west of Caramat and light infection about 8 miles west of Stevens (Table 9). Elsewhere infection levels were trace.

Table 8. Summary of incidence and infection levels of needle rusts of spruce in the Northern Survey Region in 1972

Location	Tree species	Estimated incidence (%)	Level of infection
Geraldton			
Camp 56, American Can	bS	100	low
Neys Park	bS	100	low
Suckle Creek	wS	70	trace
Murphy Creek	wS	100	trace
Kapuskasig			
Caithness Twp	bS	70	moderate
Cochrane			
Michie Twp	wS	70	moderate
Potter Twp	bS	70	moderate
Steele Twp	bS	90	high

Table 9. Summary of incidence and infection levels of the ink spot disease on trembling aspen foliage in the Northern Survey Region in 1972

Location	Avg DBH of trees (in.)	Incidence (%)	Level of infection
Geraldton			
Stevens, 8 miles west	2	72	low
Caramat, 3 miles west	2	100	moderate
Nama Creek	3	80	trace
Kapuskasig			
McMillan Twp	4	20	trace

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

A moderate infection of jack pine 10 miles east of Caramat in 1971 decreased to trace in 1972. Other infection levels on jack pine were light near Beardmore and trace at Melchett Lake, a northern record

for the disease in the Region. Evaluation of the disease in young plantations of lodgepole pine showed high incidence and light infection in O'Meara Township in the Geraldton District. Infection levels on jack pine were trace in Kipling Township in the Kapuskasing District, and moderate in Avon Township in the Cochrane District.

A Rust on Jack Pine, *Cronartium coleosporioides* Arth. (= *Peridermium stalactiforme* Arth. and Kern)

Little change occurred in the status of this rust in the Geraldton District. In Exton Township the number of active infections shown by the presence of fruiting was reduced. In mature jack pine stands in the Longlac, Caramat, Nakina and Aroland areas where previous damage was severe, little fruiting has occurred in recent years. Although scar damage has been observed in the Kapuskasing and Cochrane districts, fruiting of the disease has never been recorded.

Comandra Blister Rust, *Cronartium comandrae* Pk.

Moderate incidence and infection levels in the McKay-McLeod lakes area in 1971 were reduced to low in 1972. Low infection occurred in the Cosgrove Lake area and trace level was recorded in Bain Township. Assessments of this rust on jack pine in the Geraldton District were complicated by the overlap of similar rusts that are difficult to identify in the field.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

Infections of this rust in the Geraldton District remained at high levels in natural stands in Lapierre Township and moderate levels in plantations near Marathon and at mile 76 of the Catlonite Road. Low infection levels were found in Sandra, Pic, Exton and Errington townships.

Infection levels were high at points along the Texas Gulf Road and on jack pine on gravel eskers extending from Nellie Lake to Lipsett Lake in the Cochrane District.

White Pine Blister Rust, *Cronartium ribicola* J. C. Fischer

The fruiting of *C. ribicola* (Fig. 2) increased on plantation trees in Sandra Township where the pathogen has caused scattered white pine tree mortality in the past. Light infection occurred on scattered pole-sized trees along the Nipigon River valley in the southwestern corner of the Geraldton District.

White Pine Blister Rust
Cronartium ribicola J. C. Fischer

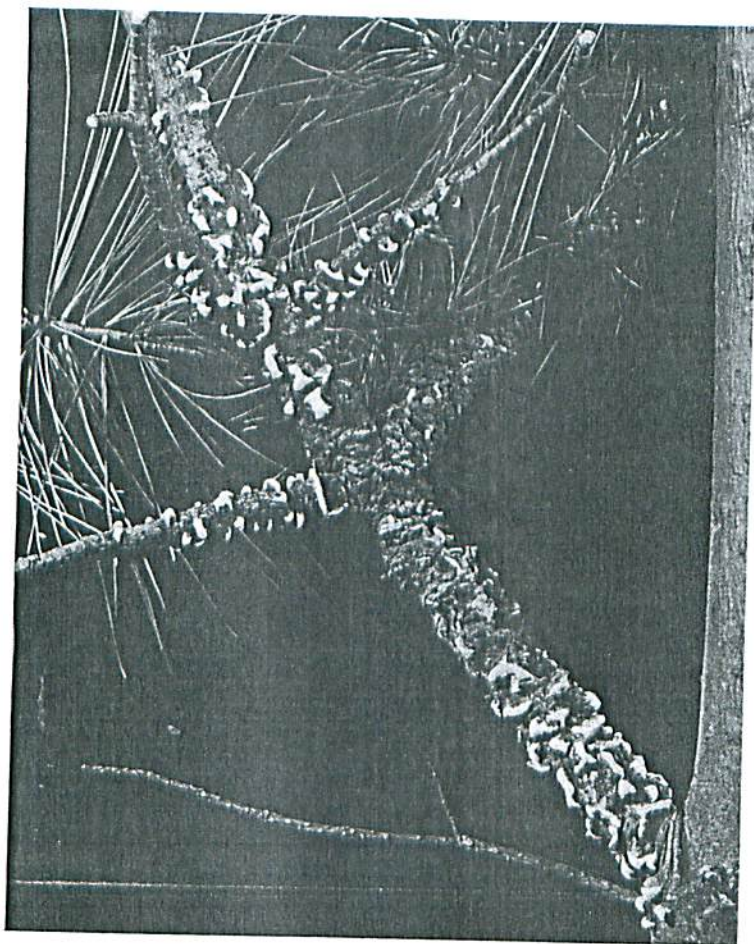


Fig. 2. Fruiting bodies of *Cronartium ribicola*
J. C. Fischer on a branch of white pine.

Gall Rust of Hard Pines, *Endocronartium harknessii* (J. P. Moore)
Y. Hiratsuka

The incidence and infection levels of this rust remained high in 1972 on jack pine trees in the Nezah area in the Geraldton District. Medium infection levels occurred one mile west of Beardmore and light tree mortality resulted when the main stems of small trees were

attacked. The disease is now known to occur as far north as Melchett Lake in the Geraldton District. Infection levels in the Cochrane District were moderate in Marathon and Moody townships, and low in Macklem and Dundonald townships (Table 10).

Table 10. Summary of incidence and infection levels of gall rust of hard pines in the Northern Survey Region in 1972

Location (Twp)	Host species	Incidence (%)	Level of infection
Geraldton District			
Summers	jP	17	moderate
Cochrane District			
Marathon	jP	70	moderate
Moody	jP	70	moderate
Macklem	jP	30	low
Dundonald	jP	25	low

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

This disease, first recognized in 1965 as a problem in nurseries and young red pine (*Pinus resinosa* Ait.) plantations in Ontario, has been found to be a problem affecting young jack pine as well. Surveys in 1972 emphasized the detection and delineation of Scleroderris hot spots where 25% or more of the trees are infected. Twelve areas totalling over 68,000 acres in the Geraldton District, four areas totalling 425 acres in the Kapuskasing District, and nine areas totalling 16,800 acres in the Cochrane District were designated as hot spots (see Appendix, Fig. A3).

High infection levels in the Geraldton District occurred near Cosgrave Lake, in pockets in the Manitouwadge-Hillsport roads area, in the Marathon boy scout plantations, in the McKay-McLeod lakes area, and in a newly infected area in Neys Park (Table 11). Owing to lack of confirmation until late in the season, the Neys Park location was not included earlier as a hot spot. Moderate infection levels occurred in Bain Township, in the vicinity of the Longlac Nursery and in the Lucy Lake area. Other hot spot areas in which future planting should be discouraged included the Manitou Falls, Terrace Bay and Sandra Township areas. Hot spots in the Kapuskasing District included small areas in Gill, Studholme and Wickstead townships and in the Spruce Falls Nursery near Moonbeam.

Infection levels in the Cochrane District decreased in red pine plantations but the incidence increased on jack pine at several points. Hot spots were located in Stimson, German, Dundonald, McCart, Aurora, Calvert, Macklem, Sheraton, Timmins and Adams townships.

New infections were low on jack pine in the Frank Lake, Humboldt Bay and Melchett Lake areas in the Geraldton District, and in Tisdale Township and the Nellie Lake area in the Cochrane District. Current tree mortality in the Cosgrave Lake area was 10% and the average mortality at 16 locations was 4%.

Table 11. Summary of incidence, infection level, and potential areas of infection by Scleroderris canker of pine in the Northern Survey Region in 1972

Location	Host species	Incidence (%)	Level of infection	Susceptible area (acres)
Geraldton District				
Longlac Nursery area	jP	5-80	moderate	15,000
Lucy Lake	jP	20-80	moderate	10,000
Sandra Twp	jP, rP	30-50	low	10,000
McKay-McLeod lakes	jP	0-40	high	10,000
Cosgrave Lake	jP	90	high	200
Manitouwadge-Hillsport roads junction	jP	70	high	7,000
Hillsport	jP	50	high	150
Terrace Bay	jP	10-60	high	2,500
Manitou Falls	jP	5-30	low	2,000
Marathon	jP, rP	10-40	high	1,000
Caramat	jP	10-80	high	10,000
Neys Park	rP	50	high	200
Kapuskasing District				
Gill Twp	rP, jP	25	low	75
Studholme Twp	rP	60	low	200
Wickstead Twp	rP, jP	20-50	low	100
Fauquier Twp	jP	85	moderate	50
Cochrane District				
Dundonald Twp	jP	30	low	100
McCart Twp	jP	30	low	100
Stimson Twp	jP	50	moderate	500
German Twp	jP, rP	72	moderate	200
Macklem, Timmins and Sheraton twp	jP, rP	5-52	moderate	15,000

Single-tree Mortality of Balsam Fir

The death of individual balsam fir trees has increased considerably in the Geraldton District since 1970. Aerial counts of all red-needled balsam fir trees were made at an elevation of 1000 ft in three prescribed flight lines near Pagwachuan Lake. Standard markings on a Turbo-jet Beaver aircraft were used to obtain continuous viewing of 1000-foot-wide strips during each flight. The converted counts to total newly dead trees per 100 acres and estimates of cumulative old mortality are shown in Table 12. These intensities of single-tree and cumulative mortality were then used as guides to compare the amounts of balsam fir mortality in extensive areas elsewhere in the district. On this basis balsam fir mortality was assessed as light with pockets of moderate intensity east of Pagwachuan Lake to Slim Jim Lake, in about 25 square miles near Loughlan Lake, in the Kinago Lake area southeast of Beardmore, in the Meta Lake area north of Kowkash, and in a large area north and west of Marathon. Elsewhere in the Geraldton and Kapuskasing districts newly dead balsam fir trees were common.

Table 12. Summary of current balsam fir mortality and estimates of cumulative old mortality in the Geraldton District in 1972

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

Root and Butt Rot Damage

The root and butt rot surveys started in balsam fir and spruce stands in 1971 were expanded in 1972 to include jack pine. Several repeat collections were made and a total of eight new plots were sampled. Singleton mortality of balsam fir was also sampled for root and butt rot organisms in each district. The organism, *Armillaria mellea* (Vahl ex Fr.) Kummer, was again the most consistent and destructive disease found in the samples. The more common root and butt rot pathogens in stand openings where serious damage occurred are shown in Table 13.

Table 13. Summary of root and butt rot pathogens by tree species in the Northern Survey Region in 1971-72

Pathogen	Tree species attacked			
	wS	bS	bF	jP
<i>Armillaria mellea</i> (Vahl ex Fr.) Kummer	2	5	2	3
<i>Polyporus tomentosus</i> Fr.	3	3	-	-
<i>Scytinostroma galactinum</i> (Fr.) Donk	-	-	1	1
<i>Coniophora puteana</i> (Schum. ex Fr.) Karst	-	1	-	-

Frost Damage

Damage to the new shoots of coniferous trees was the heaviest recorded for at least 10 years. Freezing temperatures reached 20°F over large sections of the Region between May 30 and June 2, with less severe but killing frosts recorded again between June 9 and 11.

The most severe damage in the Geraldton District occurred in black spruce plantations near Manitou Falls, in the Limestone Lake area and at points north of Onaman River (Table 14). Counts at Onaman River showed severe tree mortality in three 1971 black spruce plantations, and considerable mortality is expected in 1973 on larger trees at Manitou Falls. Frost damage was severe in regeneration and mature stands of balsam fir and black and white spruce at many other locations in the district, on tamarack (*Larix laricina* [Du Roi] K. Koch) trees in swamps north of Nakina, and on regeneration white birch trees in cutover areas in the Longlac-Caramat-Nakina area. Frost damage to the lower whorls of jack pine trees resembled lower branch mortality caused by the Scleroderris canker of pines.

Virtually all of the new shoots of balsam fir were destroyed in the southeastern part of Kapuskasing District and southwest of Timmins in the Cochrane District.

Table 14. Summary of frost damage in black and white spruce plantations in the Geraldton District in 1972

Location	Host species	Tree height (in.)	Incidence (%)	Level of damage
Onaman River, north	bS	6	100	high
Manitou Falls, east	bS	36	100	high
Limestone Lake, mile 2 $\frac{1}{2}$	wS	24	100	high
Limestone Lake, mile 4 $\frac{1}{2}$, west	wS	24	75	trace
Limestone Lake, mile 4 $\frac{1}{2}$, east	wS	24	100	high
Limestone Lake, mile 5 $\frac{1}{2}$, west	bS	60	100	high
Limestone Lake, mile 5 $\frac{1}{2}$, east	wS	84	100	high
Limestone Lake, mile 6.2	bS	120	100	moderate
Limestone Lake, mile 9, V-plough	bS	6	5	trace
Limestone Lake, mile 9, grass	bS	12	100	moderate

Table 15. Other noteworthy diseases

Organism	Host(s)	Remarks
<i>Apiosporina collinsii</i> (Schw.) Hoehn.	Ser	trace levels at many points
<i>Chrysomyxa arctostaphyli</i> Diet.	bS	light infection near Pays Plat
<i>Chrysomyxa pirolata</i> Wint.	bS	Counts on 20 trees showed trace infection at Humboldt Bay Road north of Beardmore.
<i>Cronartium ribicola</i> J.C. Fischer	wP	high infection level in Sandra Twp, light in south-west portion of Geraldton District
<i>Davisomycella ampla</i> (Davis) Darker	jP	reduced from moderate in 1971 to trace level in 1972, 10 miles east of Caramat

(continued)

Table 15. Other noteworthy diseases (concluded)

Organism	Host(s)	Remarks
<i>Gymnosporangium cornutum</i> Arth. ex Kern	moAs	trace levels at several points in the Region
<i>Hypoxyylon mammatum</i> (Wahl.) Miller	tA	a major cause of loss in the Region
<i>Linosporea tetraspora</i> G.E. Thompson	bPo	Evaluation showed high incidence and low infection near Melchett Lake, and these were commonly observed in the Region.
<i>Lophodermium pinastri</i> (Schrad. ex Hook.) Chev.	jP	trace infection in Spruce Falls Nursery and in Dundonald and Macklem twp in Cochrane District
<i>Melampsorella caryophyllacearum</i> Schroet.	bF	light incidence at Lukinto Lake in Geraldton District
<i>Pollaccia elegans</i> Serv.	bPo	trace infection at many points in the Region
<i>Pollaccia radiosa</i> (Lib.) Bald. & Cif.	tA	Evaluation showed 55% incidence and trace infection near Stevens in the Geraldton District. Trace infection was observed in Hansen Twp, Kapuskasing District.
<i>Pucciniastrum epilobii</i> Otth	bF	trace levels in the Nakina area
<i>Scolecnectria cucurbitula</i> (Tode ex Fr.) Booth	jP	trace at junction of Manitouwadge-Hillsport roads

APPENDIX

NORTHERN SURVEY REGION

DISTRICTS
1 GERALDTON
2 KAPUSKASING
3 COCHRANE

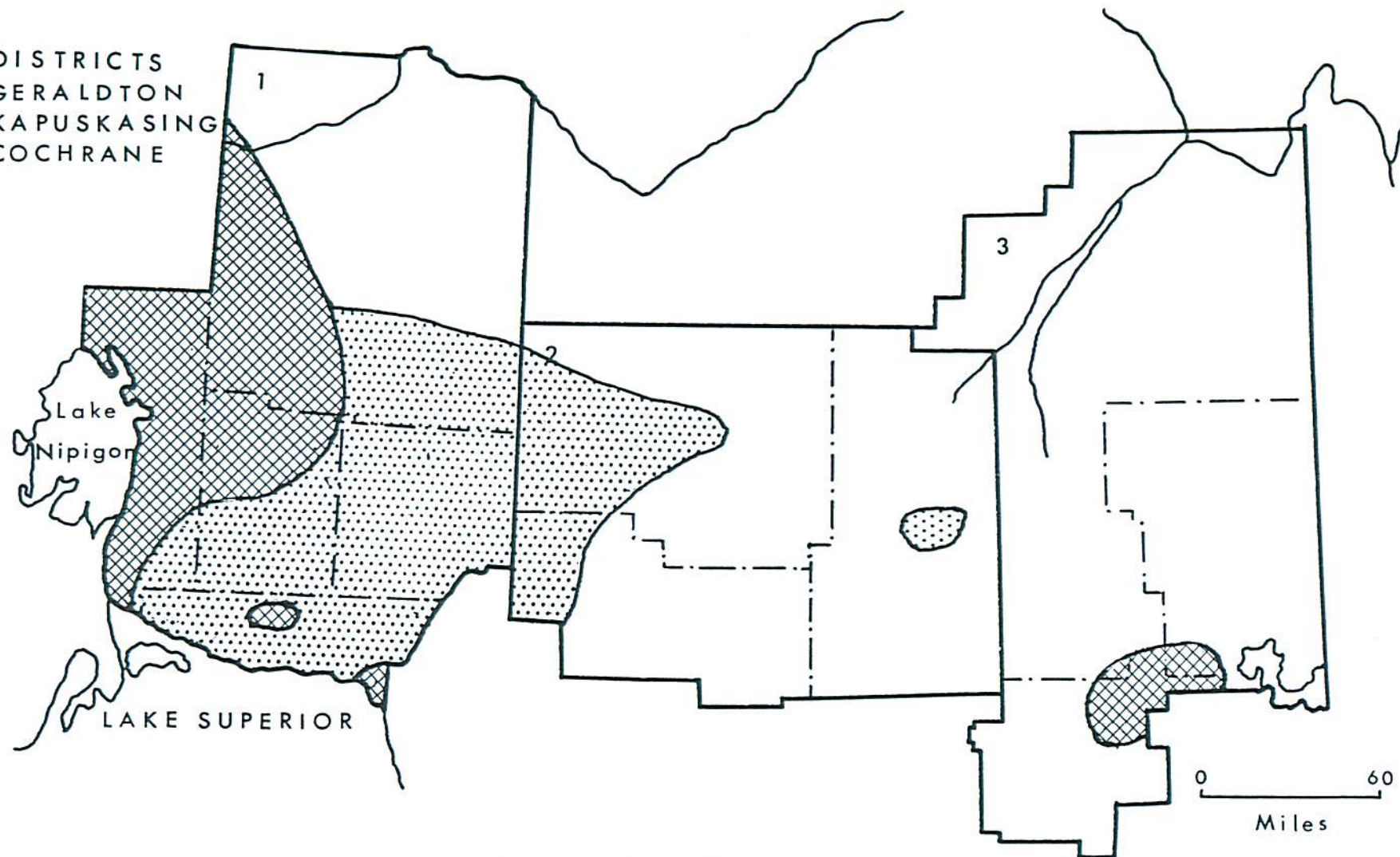




Fig. A1. BIRCH SKELETONIZER

Areas within which light and moderate-to-severe skeletonizing occurred in 1972.

Light skeletonizing 
Moderate-to-severe skeletonizing 

NORTHERN SURVEY REGION

DISTRICTS
1 GERALDTON
2 KAPUSKASING
3 COCHRANE

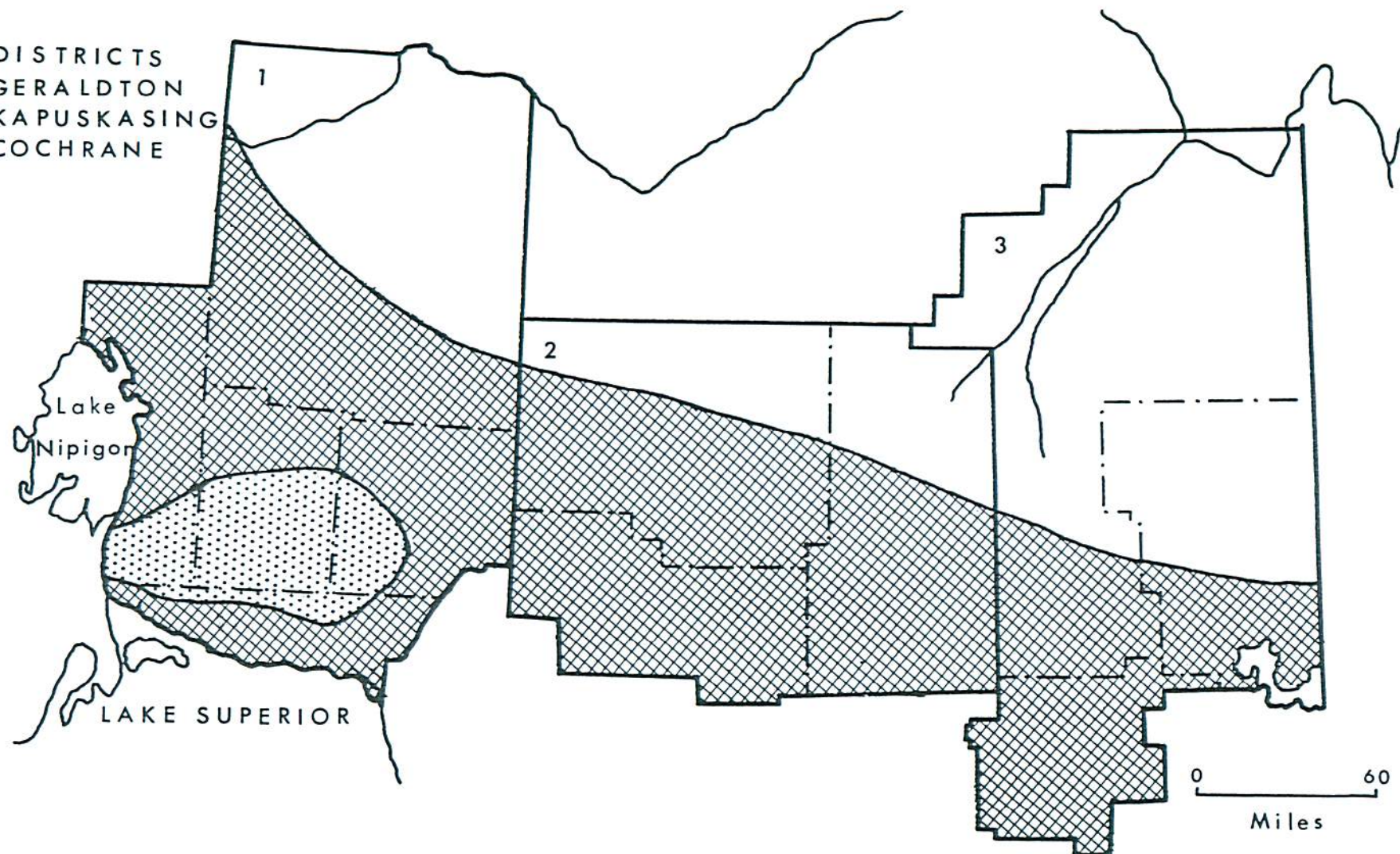




Fig. A2. LARGE ASPEN TORTRIX

Areas within which light and moderate-to-severe defoliation occurred in 1972.

Light defoliation 
Moderate-to-severe defoliation 

NORTHERN SURVEY REGION

DISTRICTS
1 GERALDTON
2 KAPUSKASING
3 COCHRANE

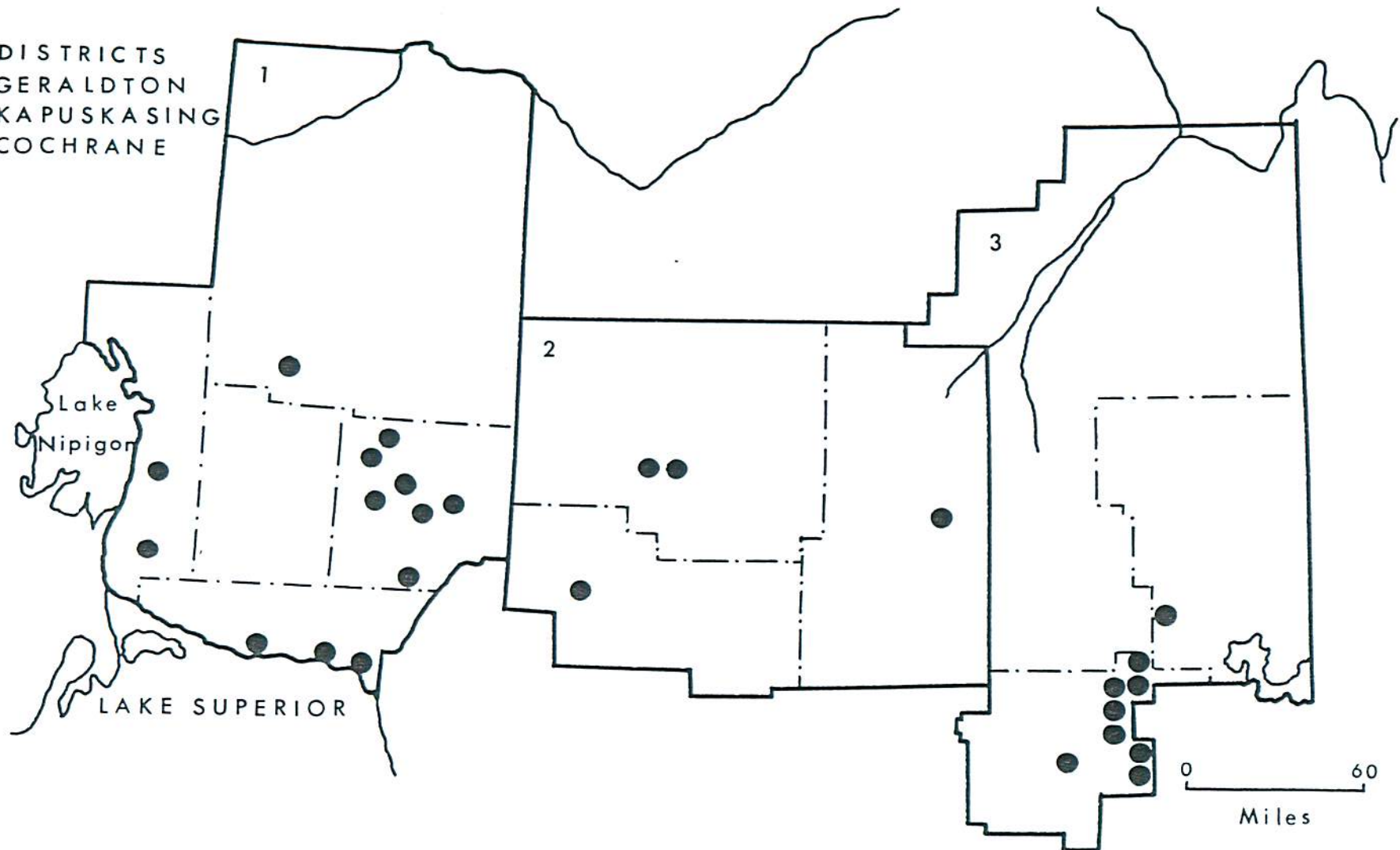


Fig. A3. SCLERODERRIS CANKER OF PINE

Areas of high infection ('hot spots')
determined in 1972