

RESULTS OF FOREST INSECT AND
DISEASE SURVEYS IN THE
NORTHERN REGION OF
ONTARIO, 1983

(FOREST DISTRICTS: MOOSONEE, HEARST, KAPUSKASING, COCHRANE,
CHAPLEAU, TIMMINS, KIRKLAND LAKE and GOGAMA)

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CANADIAN FORESTRY SERVICE

DEPARTMENT OF THE ENVIRONMENT

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SURVEY HIGHLIGHTS

Records at weather stations in the Northern Region showed that lower than average temperatures persisted through May, retarding foliage development and inhibiting insect activity. This situation was reversed in June when excellent conditions stimulated insect populations and accelerated growth.

Substantial increases in the extent and intensity of spruce budworm infestations were recorded in Hearst, Cochrane and Kirkland Lake districts and egg-mass sampling indicates further expansion in 1984. Ground and/or aerial spraying operations of seed production areas, plantations, nurseries and other high-value stands were carried out by the Ontario Ministry of Natural Resources (OMNR) in several districts.

Heavy infestations of the birch skeletonizer again caused severe foliar damage over large areas in Chapleau, Timmins and Gogama districts. Relatively high numbers of yellowheaded spruce sawfly were present through the Region and caused considerable damage in black spruce plantations in Stock Township, Timmins District. The forest tent caterpillar was no longer a major pest except in a comparatively small area northeast of Matheson in the Kirkland Lake District. The infestation of spearmarked black moth in Chapleau District declined appreciably, and greatly reduced populations of the Swaine sawfly caused only minor defoliation in the southern part of the Kirkland Lake District.

Special surveys carried out in the Region in 1983 included pheromone trapping for several species of insects and detailed surveys for insects and diseases affecting high-value black spruce and jack pine plantations.

The generous assistance and cooperation extended by OMNR and woods industry personnel in all districts of the Region are gratefully acknowledged.

The same format was followed in categorizing pests as in the 1982 Northern Region report.

Major Insects or Diseases

capable of causing serious injury to or death of living trees or shrubs

*Minor Insects or Diseases **

capable of sporadic or localized injury but not usually a serious threat to living trees or shrubs

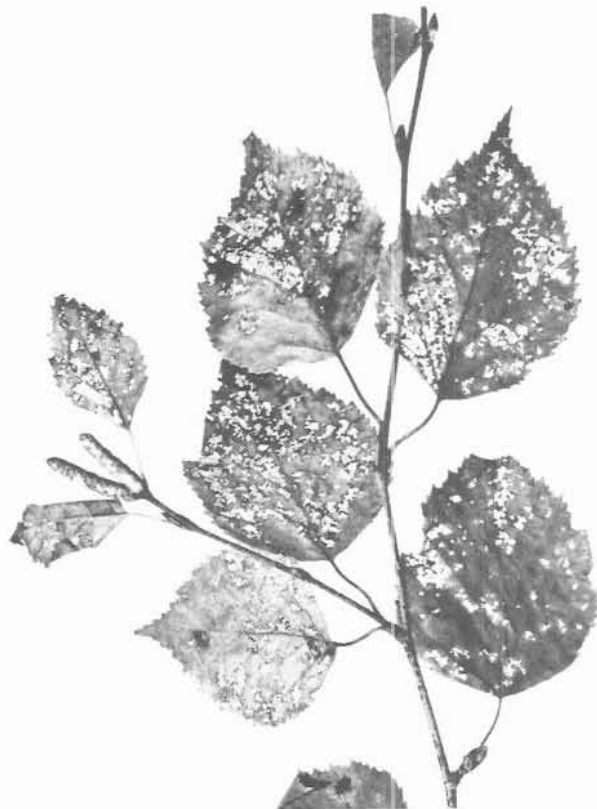
* No minor insects were reported in the Northern Region in 1983.

Frontispiece



Birch skeletonizer,
Bucculatrix canadensisella Cham., larvae
feeding on underside
of white birch (*Betula
papyrifera* Marsh.) leaf

Damage by birch skeletonizer



Other Forest Insects/Diseases (Tables)

These tables provide information on two types of pest:

- 1) those which are of minor importance and have not been known to cause serious damage to forest trees,
- 2) those which are capable of causing serious damage but, because of low populations or for other reasons, did not cause serious damage in 1983.

L.S. MacLeod

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TABLE OF CONTENTS

Page

INSECTS

Major Insects

Birch Skeletonizer, <i>Bucculatrix canadensisella</i>	1
(All districts)	
Spruce Budworm, <i>Choristoneura fumiferana</i>	1
(All districts)	
Jack Pine Budworm, <i>Choristoneura pinus pinus</i>	1
(All districts)	
Larch Casebearer, <i>Coleophora laricella</i>	3
(Cochrane and Kapuskasing districts)	
Eastern Pine Shoot Borer, <i>Eucosma gloriola</i>	3
(All districts)	
Birch Leafminer, <i>Fenusa pusilla</i>	3
(All districts)	
American Aspen Beetle, <i>Gonioctena americana</i>	3
(Chapleau, Kirkland Lake and Timmins districts)	
Forest Tent Caterpillar, <i>Malacosoma disstria</i>	8
(Cochrane and Kirkland Lake districts)	
Whitespotted Sawyer, <i>Monochamus scutellatus</i>	8
(All districts)	
Jack Pine Sawflies, <i>Neodiprion</i> spp.	10
(All districts)	
Swaine Jack Pine Sawfly, <i>Neodiprion swainei</i>	10
(Kirkland Lake District)	
Aspen Leafblotch Miner, <i>Phyllonorycter ontario</i>	10
(All districts)	
Yellowheaded Spruce Sawfly, <i>Pikonema alaskensis</i>	12
(All districts)	
White Pine Weevil, <i>Pissodes strobi</i>	12
(All districts)	
Mountain-ash Sawfly, <i>Pristiphora geniculata</i>	12
(All districts)	

(continued)

TABLE OF CONTENTS (concluded)

Page

Major Insects (concluded)

Spearmarked Black Moth, *Rheumatoptera hastata* 12
(Chapleau, Gogama, Kirkland Lake and Timmins districts)

Other forest insects 15

TREE DISEASES

Major Diseases

Armillaria Root Rot, *Armillaria mellea* 19
(All districts)

Ink Spot of Aspen, *Ciborinia whetzellii* 20
(All districts)

Sweetfern Blister Rust, *Cronartium comptoniae* 20
(All districts)

Western Gall Rust, *Endocronartium harknessii* 21
(All districts)

Minor Diseases

Shoot Blight, *Venturia macularis* 22
(All districts)

Other forest diseases 24

Abiotic Damage

Wind Damage 25

Special Surveys

Black Spruce Plantations 25

Black Spruce Seed and Cone Pests 30

Permanent Jack Pine Sample Plots 30

INSECT TRAPS

Spruce Budworm Pheromone Traps 36

Gypsy Moth Pheromone Traps 36

Light Traps 36

INSECTS

Major Insects

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Major changes in the birch skeletonizer infestation were evident in 1983. In the northern districts of the Region the infestation collapsed and defoliation of white birch (*Betula papyrifera* Marsh.) stands was generally light in the Hearst, Kapuskasing and Cochrane districts. Moderate defoliation was restricted to a few pockets in Dundonald and Mortimer townships in Cochrane District. Major declines also occurred in the western part of the Chapleau District, the northern part of the Timmins District and over the major part of the Kirkland Lake District (Fig. 1). Severe defoliation continued in the eastern part of the Chapleau District and over the entire Gogama District (see Frontispiece). The total area of severe defoliation was approximately 20,195 km², compared with 56,000 km² in 1982. Trace-to-light defoliation was general over the remainder of birch stands in the Region, except in the extreme southeastern part of the Kirkland Lake District, where moderate-to-severe defoliation persisted.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Results of damage surveys, population sampling and egg-mass counts of this perennial pest will be published with those of other regions at a later date in a report specifically devoted to this insect. That report will provide a complete description and analysis of developments in the spruce budworm situation in Ontario in 1983 and will give infestation forecasts for the province for 1984.

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

No infestations of the jack pine budworm have been found in the Northern Region in recent years and few larvae have been recovered during sampling of jack pine (*Pinus banksiana* Lamb.) stands or plantations. Although only low numbers were found in 1983 it may be significant that the insect was present in several districts of the Region and that heavy infestations were recorded in the Algonquin, Northeastern and North Central regions.

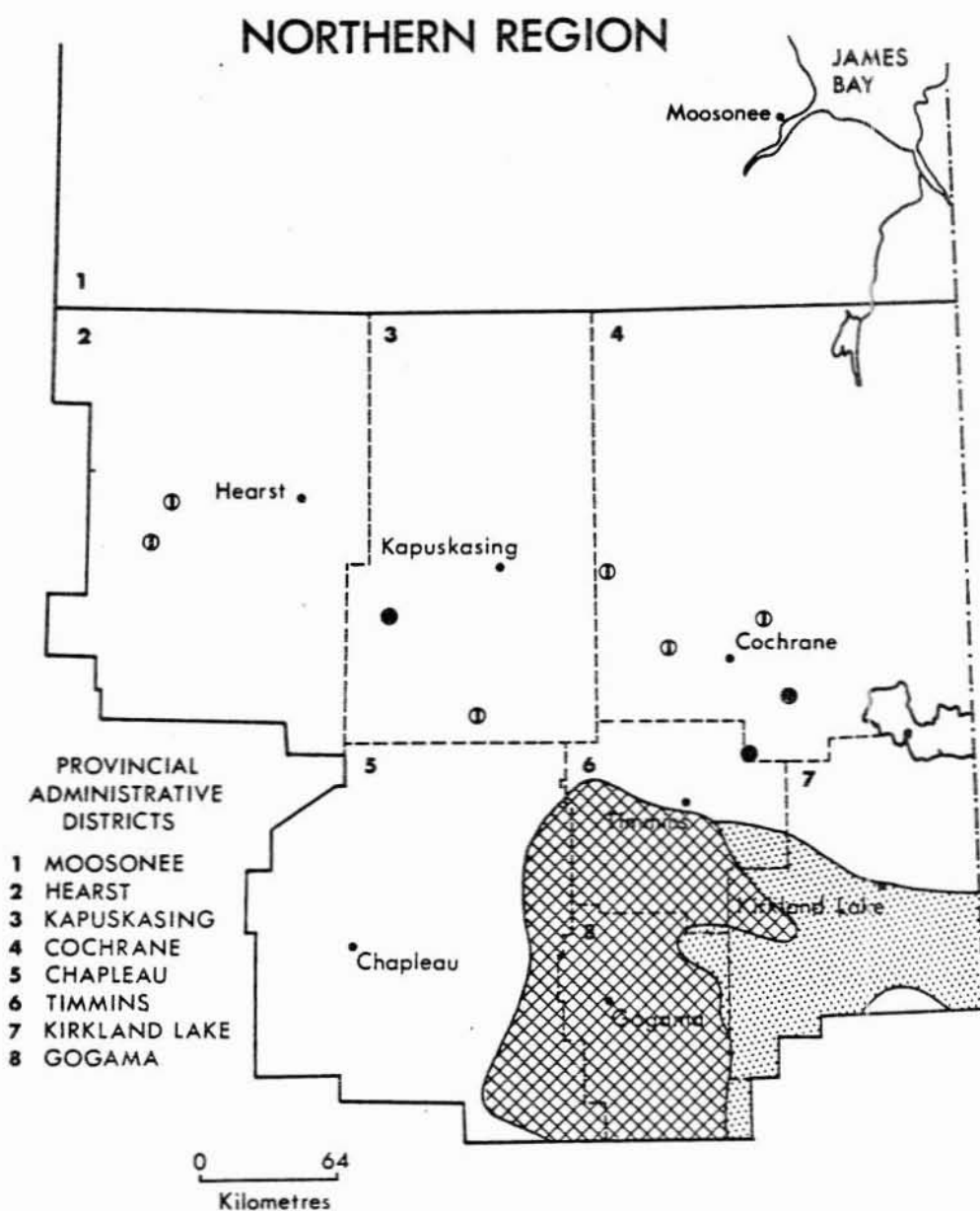


Figure 1

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Areas in which defoliation of white birch (*Betula papyrifera* Marsh.) occurred in 1983.

Moderate-to-severe or ●

Light or ①

Larch Casebearer, *Coleophora laricella* (Hbn.)

High numbers of casebearers were found in Fauquier Township, Kapuskasing District, from 1971 to 1975 and light defoliation of the upper crowns of tamarack (*Larix laricina* [Du Roi] K. Koch) trees was common at many points in the Kapuskasing and Cochrane districts. The infestation collapsed in 1976 and little damage has been observed in recent years. The situation remained unchanged in 1983 when quantitative sampling in Calder, Clute and Kennedy townships, Cochrane District, yielded only two casebearers and no evidence of defoliation was reported from other districts in the Region.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

This shoot borer was widely distributed through jack pine plantations in the Region. Leader mortality varied considerably from district to district (Table 1). Only the current year's shoots are attacked and damage may affect tree form or retard proper growth (see photo, page 5).

Birch Leafminer, *Fenusa pusilla* (Lep.)

As in recent years high populations of the birch leafminer were distributed through all districts and an increasing number of mature white birch trees showed conspicuous discoloration from the air (see photo, page 5). Damage to ornamental trees continued to plague property owners, and numerous requests for control of the insect resulted. The importance of birch as a fuel wood in northeastern Ontario has increased the interest and concern of residents in organisms affecting this species.

Specific locations of heavy foliar damage were reported from urban areas in Cochrane, Iroquois Falls, Chapleau, Timmins, South Porcupine, Matheson, Kirkland Lake, Englehart, Gowganda and New Liskeard (Fig. 2). In forest situations discoloration was clearly evident from the air and was noted in Racine, Ivanhoe, Mountbatten and Hodgetts townships, Chapleau District; in Jack Township, Gogama District; in Calvert and Ottaway townships, Cochrane District; and in Studholme, Gill, Shannon, Templeton and Larkin townships, Hearst District. Damage was widespread but occurred in pockets affecting approximately 260 ha.

American Aspen Beetle, *Gonioctena americana* (Schaeef.)

Relatively low populations of the aspen beetle were reported from all districts in 1983. Small areas of light defoliation of trembling aspen (*Populus tremuloides* Michx.) trees occurred in Gilliland, Bliss and Panet townships, Chapleau District; in Black, McEvay, Bowman and McCann townships, Kirkland Lake District; and in Robb, Sheraton and Whitney townships, Timmins District, totaling approximately 200 ha. In all instances defoliation was less than 20% and little foliar damage was observed in other districts of the Region.

Table 1. Summary of leader damage caused by the eastern pine shoot borer in six districts in 1983 (counts based on the examination of 150 or 300 jack pine trees at each location).

Location (Twp)	Avg ht of trees (m)	Estimated trees per ha	Estimated area affected (ha)	Leaders killed (%)
Chapleau District				
Dalmas	2.7	3,000	5	5.3
Edith	2.4	2,990	34	2.0
Peters	3.3	2,500	60	4.6
*Bliss	2.0	2,775	75	1.0
*Gilliland	2.0	2,424	60	1.0
Gogama District				
Invergarry	2.2	6,000	40	1.3
Vrooman	1.6	2,990	20	0.6
Jack	2.6	6,000	20	3.3
Cochrane District				
Case	1.5	2,800	25	0.7
Hearst District				
Arnott	1.9	2,600	50	0.7
*Cross	1.1	2,550	220	0.7
Timmins District				
Adams	1.5	2,500	10	5.0
Kirkland Lake District				
Catharine	2.0	2,500	5	9.0
Nordica	3.2	2,990	10	15.0
Hincks	2.0	2,500	11	10.0
Arnold	2.0	2,500	10	7.0

*300-tree sample



Mortality of a jack pine (*Pinus banksiana* Lamb.) leader caused by the eastern pine shoot borer, *Eucosma gloriola* Heinr.

Damage caused by the birch leafminer, *Fenusa pusilla* (Lep.)





Aspen (*Populus* L. spp.) shoot
infected with the fungus,
Venturia macularis (Fr.)
Müller & Arx

Wind damage



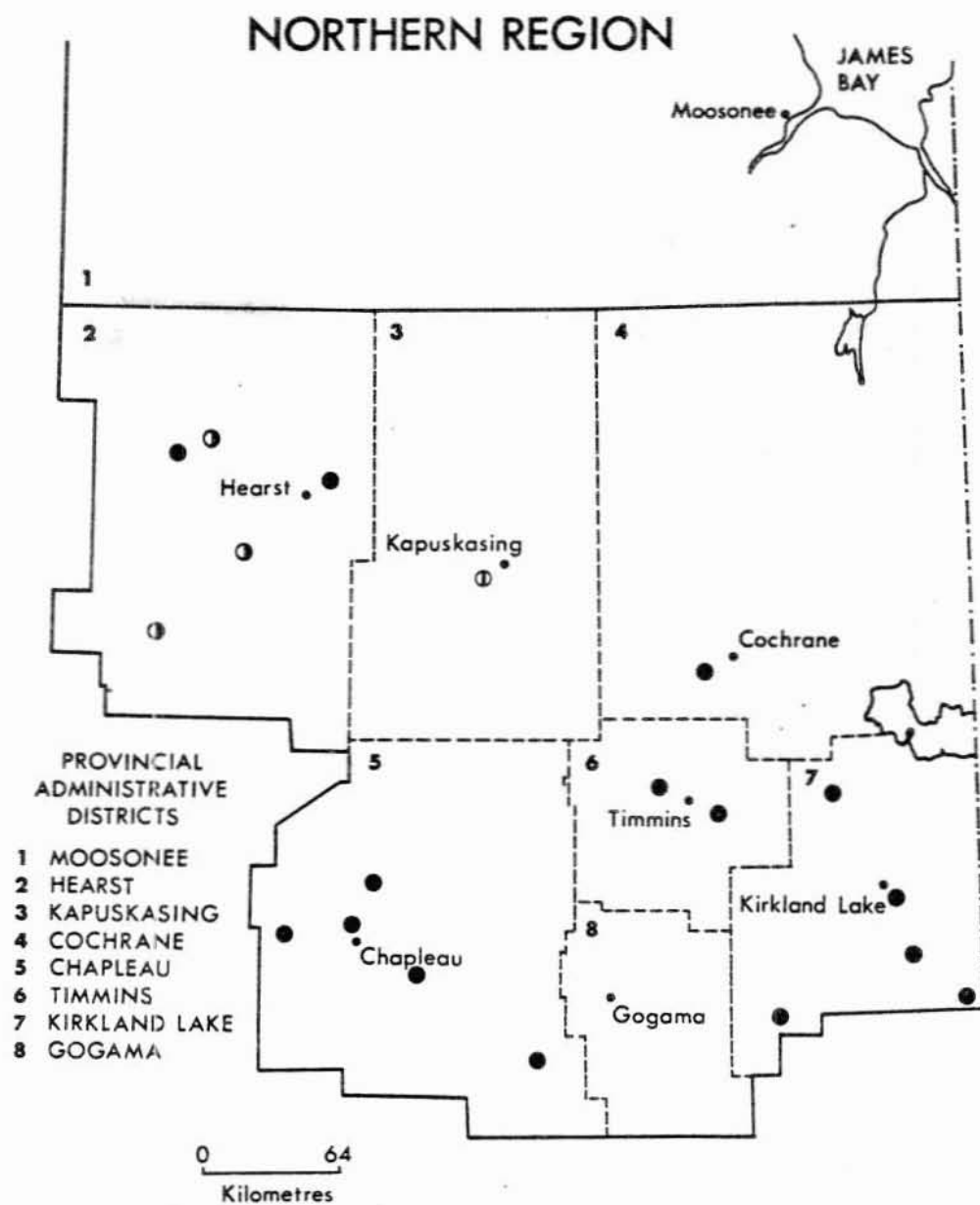


Figure 2

Birch Leafminer, *Fenusa pusilla* (Lep.)

Locations in which damage occurred in 1983

Severe ●

Moderate ○

Light ⊖

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

There was a major decline in populations of the forest tent caterpillar in the Region. The infestation north of Cochrane which had persisted for several years and totaled about 32,456 ha in 1982 collapsed completely in 1983. The area of severe defoliation in the Matheson infestation, Kirkland Lake District, declined from 29,600 ha in 1982 to approximately 4,100 ha in 1983 (Fig. 3). Most of the defoliation occurred in Beatty and Carr townships, southwest of Painkiller Lake. Early checks showed relatively high emergence of larvae from the egg bands but aspen foliage did not appear until as late as 31 May, a fact that suggests that many of the early-hatched larvae starved.

Egg-band sampling indicated that pockets of severe defoliation would recur in the Matheson infestation but no major expansion is anticipated (Table 2).

Table 2. Summary of forest tent caterpillar egg-band counts on trembling aspen in the Kirkland Lake District in 1983 and infestation forecasts for 1984.

Location (Twp)	Avg DBH of trees (cm)	No. of trees sampled	Total no. of egg bands	Infestation forecasts for 1984
Beatty	8	1	20	heavy
Carr	5	1	11	"
Coulson	5	1	31	"
Hislop	13	3	0	nil

Whitespotted Sawyer, *Monochamus scutellatus* (Say)

Little damage by adult sawyer beetle feeding was noted in any of the districts in the Region. All areas in which infestations had caused tree mortality of black spruce (*Picea mariana* [Mill.] B.S.P.) and jack pine in 1982 were rechecked, but no damage was found in 1983.

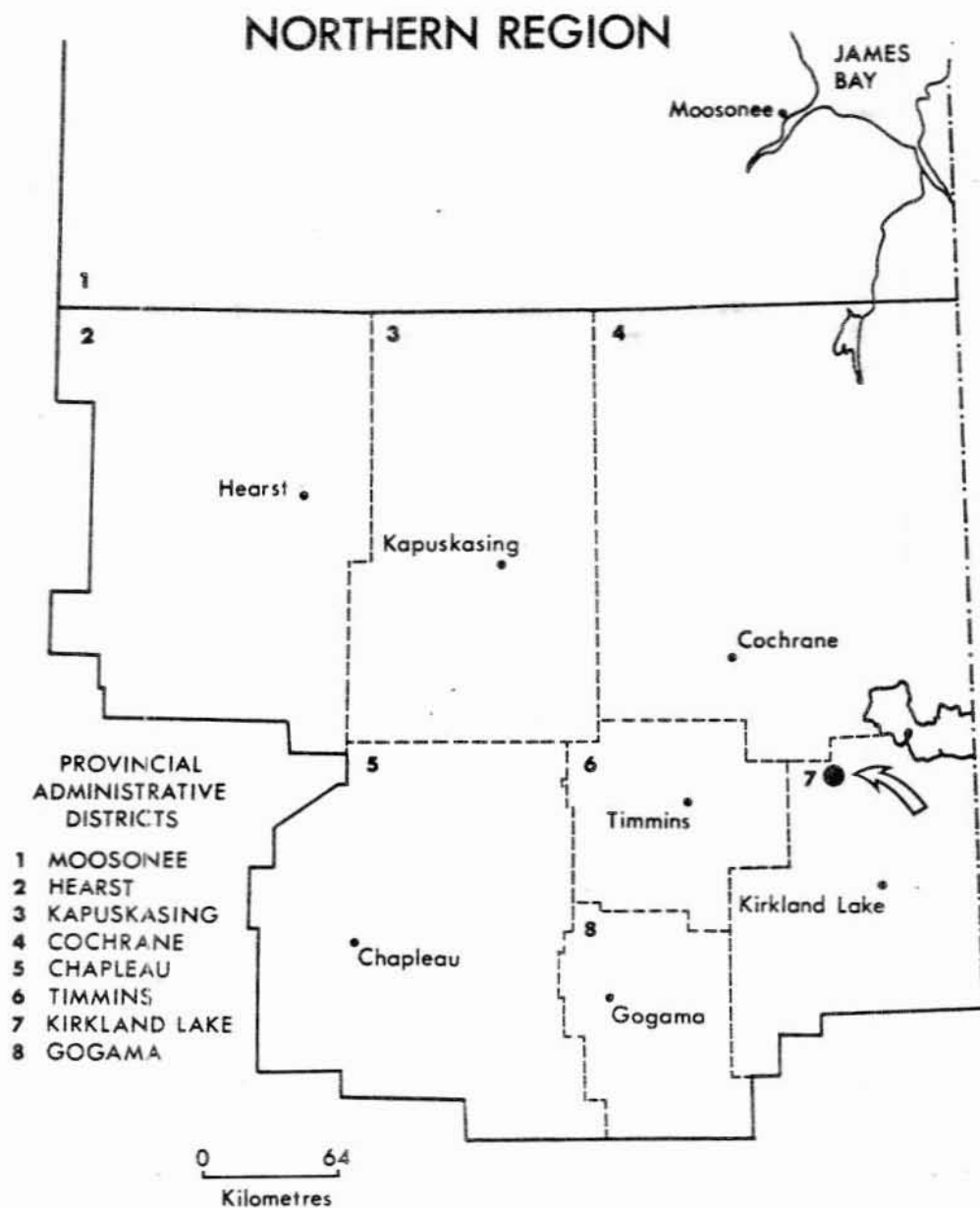


Figure 3

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.
 Location within which moderate-to-severe
 defoliation occurred in 1983 ●

Jack Pine Sawflies, *Neodiprion* spp.

Three species of *Neodiprion* sawflies persisted through jack pine stands and plantations, although populations appeared to be somewhat reduced from those of 1982. The red pine sawfly, *Neodiprion nanulus nanulus* Schedl., the most common species, was reported from seven districts in 1983. Defoliation ranged from 2 to 15% in many stands examined in the Chapleau and Gogama districts. The largest infestation occurred along Highway 560 in Milner and Tyrrell townships, Kirkland Lake District, where approximately 5% of fringe trees in 150 ha sustained 10% defoliation. The jack pine sawflies, *N. pratti banksianae* Roh. and *N. virginianus* complex, were less common and caused little damage in any of the districts of the Region.

Swaine Jack Pine Sawfly, *Neodiprion swainei* Midd.

In 1982 a general reduction in the intensity of the Swaine sawfly infestation was noted in the Elk Lake Management Unit. This trend continued in 1983 and numbers declined to levels at which defoliation was insignificant over most of the previously infested area.

Two relatively small areas of defoliation were mapped in the Banks-Wallis infestation north of Banks Lake. The first was located in the western part of Banks Township near the Makobe River and the second on the southwest side of Alexander Lake in Willet Township, and totaled approximately 518 ha of moderate defoliation. Generally low numbers were found throughout the areas infested in 1982 and in the Lady Evelyn Lake infestation, where little defoliation was evident in 1983.

Few sawflies were found in jack pine plantations between South-bear and Makobe lakes and only scattered colonies in the Gamble-McGiffin plantations near Chalice Lake. Moderate defoliation occurred on an island in the northeast arm of Lake Temagami and on a small island in Rabbit Lake, Temagami District.

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)

High populations of this insect recurred in many of the same areas that had been infested in 1982 (Fig. 4). In Chapleau District, heavy discoloration of regeneration and immature trembling aspen trees was common and was particularly noticeable in Brutus, Blamey and Racine townships. Increased numbers were found throughout Cochrane and Kapuskasing districts, especially north of Highway 11 where populations were relatively light in 1982. Severe discoloration was found through Hearst District; at one point in Studholme Township leaf mines averaged eight per leaf in comparison with three to five at other locations. In Timmins and Kirkland Lake districts foliar damage was less severe and was restricted to aspen regeneration in cutover areas.

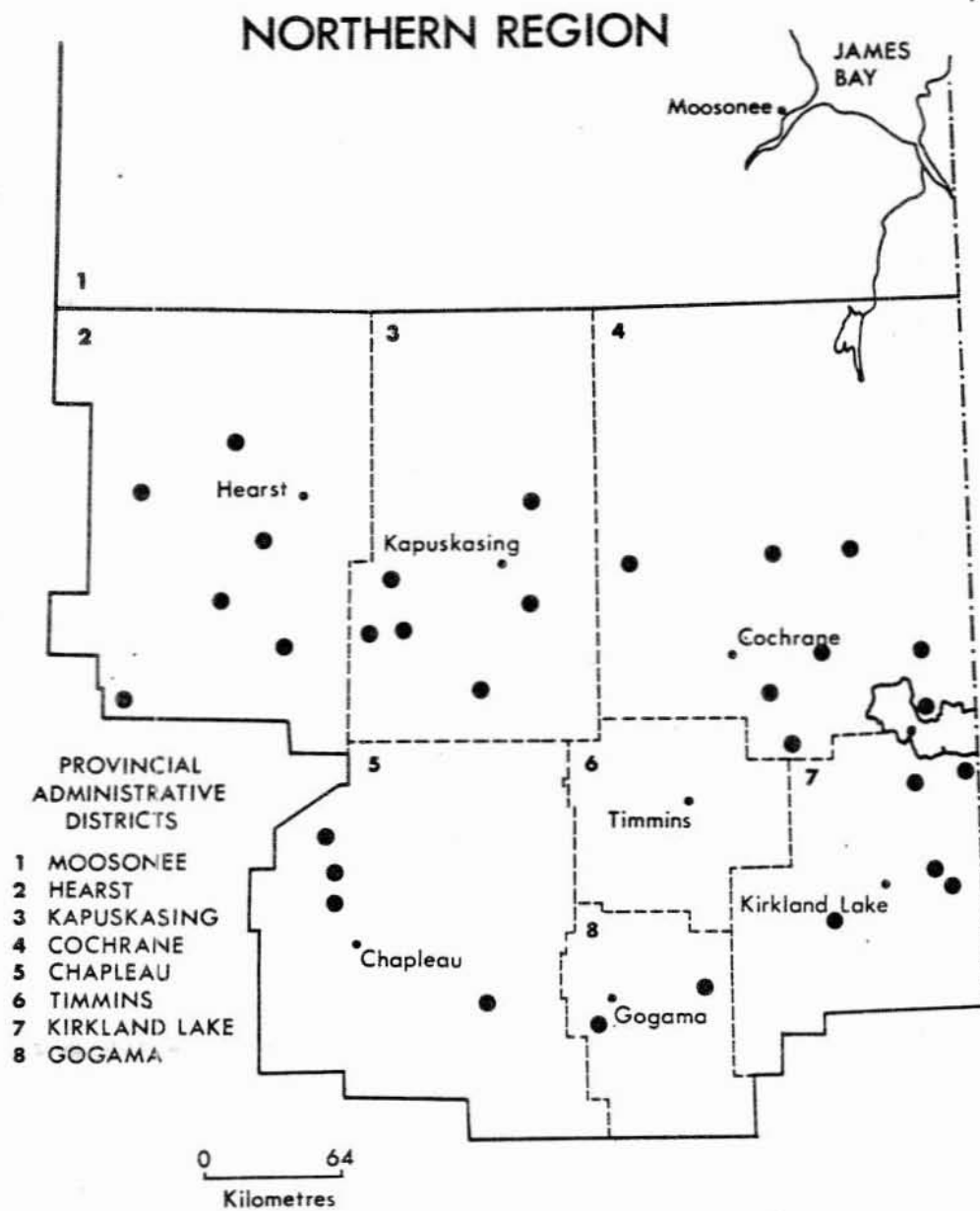


Figure 4

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)

Locations in which damage occurred in 1983

Moderate-to-severe ●

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

Varying degrees of sawfly-related damage were reported from most districts in the Region. Light defoliation only was found through Hearst and Kapuskasing districts, except along Highway 11 at the eastern approach to the town of Kapuskasing where ornamental white spruce (*Picea glauca* [Moench] Voss) trees were heavily damaged. In Cochrane District ornamentals in Glackmeyer Township were severely defoliated and at one point in Calder Township where high populations had persisted for several years an evaluation showed an average of 3% current defoliation. Windbreaks and ornamental trees were also damaged in the town of Chapleau, at Five Mile Lake Provincial Park and at Mulligan's Bay in Gallagher Township, Chapleau District. Pockets of moderate-to-severe defoliation were observed regularly through Kirkland Lake District and extensive damage occurred in OMNR plantations in Stock Township, Timmins District, where approximately 283 ha of black spruce (*P. mariana* [Mill.] B.S.P.) were heavily infested.

White Pine Weevil, *Pissodes strobi* (Peck)

In Hearst, Kapuskasing and Cochrane districts comparison of the results of quantitative sampling indicated an overall reduction in leader mortality from 2.2% in 1982 to .5% in 1983. Little change was observed in other districts of the Region. Sampling results for 1983 are summarized in Table 3.

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.)

Moderate-to-severe defoliation of mountain-ash (*Sorbus* spp.) trees occurred along Highway 655 in Nesbitt Township, Cochrane District; along Highway 11 in Studholme and Gill townships, Hearst District; and on ornamental trees in the town of Chapleau. At other locations in Chapleau, Gogama, Timmins and Kirkland Lake districts defoliation usually did not exceed 50%; this represents a slight reduction in populations encountered in 1982.

Spearmarked Black Moth, *Rheumaptera hastata* (Linn.)

A pronounced decline in extent and intensity of infestation by this leafroller was evident in the Chapleau and Gogama districts. The area of moderate-to-severe defoliation declined from 4,081 km² in 1982 to 1,139 km² in 1983 and was generally classed as light (Fig. 5). Although the insect was found commonly through both districts and occasionally in the Timmins and Kirkland Lake districts, numbers were low and defoliation was negligible.

Table 3. Summary of damage caused by the white pine weevil in seven districts in 1983 (counts based on the examination of 150 or 300 trees at each location).

Location (Twp)	Host	Avg ht of trees (m)	Estimated trees per ha	Leaders attacked (%)	Estimated area affected (ha)
Chapleau District					
Dalmas	jP	3.7	3,000	21	5
Edith	jP	2.4	2,990	5	34
Peters	jP	3.3	2,500	5	60
*Bliss	jP	1.5	2,775	1	75
*Gilliland	jP	2.0	2,424	2	60
Gogama District					
Invergarry	jP	3.5	2,500	6	80
Invergarry	jP	2.2	6,000	3	40
Jack	jP	2.6	6,000	1	60
Cochrane District					
Case	jP	1.5	2,800	0	25
Calder	WS	3.0	2,700	1	2
Fournier	BS	1.8	2,200	1	20
*Sheldon	jP	0.5	2,700	0	93
Hearst District					
Studholme	BS	2.2	3,900	1	25
Devitt	BS	5.2	3,000	0	40
Kapusksing District					
Shearer	BS	2.2	3,900	1	40
Idington	BS	4.4	2,300	1	40
Opasatika	BS	.8	2,200	1	50
Timmins District					
Adams	jP	1.5	2,500	7	10
Kirkland Lake District					
Catharine	jP	2.0	2,500	6	5
Dunmore	jP	2.3	2,900	6	50
Nordica	jP	3.2	2,990	8	10
Hincks	jP	2.0	2,500	8	11
Arnold	jP	2.0	2,500	4	10

*300-tree sample

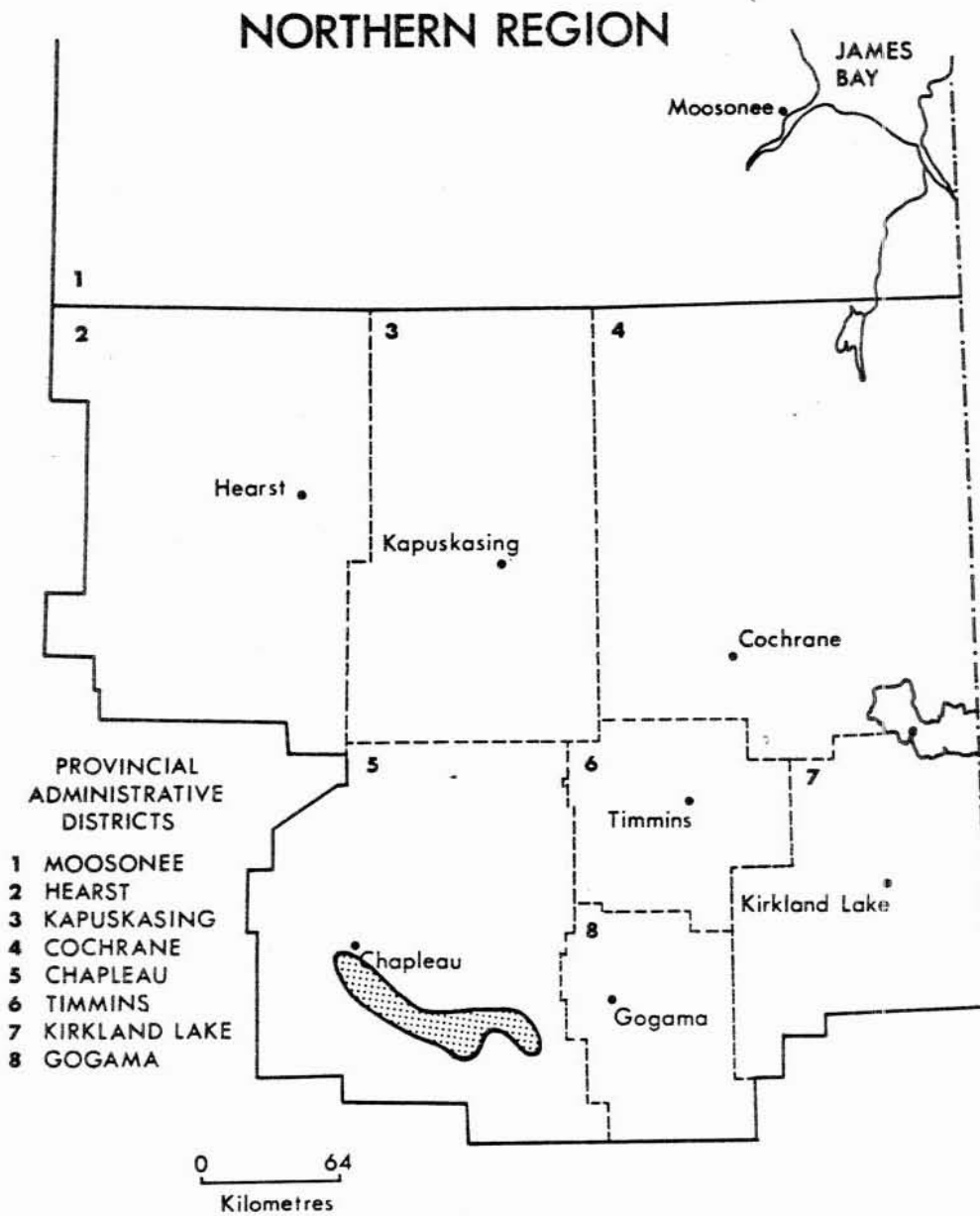


Figure 5

Spearmarked Black Moth, *Rheumaptera hastata* (Linn.)

Area within which light defoliation occurred
in 1983



Table 4. Other forest insects.

Insect	Host(s)	Remarks
<i>Aceria</i> sp. nr. <i>dispar</i> Nalepa Aspen leaf mite	tA	dark, shrunken foliage 'balls' common at many points in Timmins and Kirkland Lake dis- tricts
<i>Acleris</i> <i>variana</i> (Fern.) Eastern blackheaded budworm	bF,wS, bS	low numbers in Way and Devitt twps, Hearst District and Calder Twp, Cochrane District
<i>Acrobasis</i> <i>betulella</i> Hlst. Birch tubemaker	wB	higher damage than in 1982 in Timmins District
<i>Adelges</i> <i>cooleyi</i> (Gill.) Cooley spruce gall adelgid	bLS,wS	moderate numbers on ornamen- tals in Chapleau and on wind- breaks at Gogama Tree Nursery
<i>Adelges</i> <i>strobilobius</i> (Kalt.) Pale spruce gall adelgid	wS	higher populations than in previous years in Kapuskasing, Hearst and Cochrane districts
<i>Altica</i> <i>ambiens alni</i> Harr. Alder flea beetle	Al	severe defoliation along Hwy 101 east and west of Matheson in Kirkland Lake District and in Racine Twp, Chapleau Dis- trict
<i>Archips</i> <i>argyrospilus</i> (Wlk.) Fruittree leafroller	tA,wB	widespread but in low numbers through Timmins and Kirkland Lake districts
<i>Archips</i> <i>cerasivoranus</i> (Fitch) Uglynest caterpillar	ecCh pCh	numerous nests through rural areas in New Liskeard-Earleton area, Kirkland Lake District
<i>Cecidomyia</i> <i>resinicola</i> (O.S.) Jack pine resin midge	jP	common in most stands examined; high numbers in Neelands, Eisen- hower, Smuts and Pingal twps, Chapleau District
<i>Cecidomyia</i> sp.	tL	high amount of flagging in Panet Twp, Chapleau District

(continued)

Table 4. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Choristoneura rosaceana</i> (Harr.) Obliquebanded leafroller	tA, wB	common in Timmins, Kirkland Lake and Chapleau districts but did not cause significant defoliation
<i>Chrysomela walshi</i> Brown Balsam poplar leaf beetle	bPo	damaged leaves conspicuous in most stands examined in Kirkland Lake and Timmins districts
<i>Conophthorus banksianae</i> McPherson Jack pine tip beetle	jP	high numbers in Ivanhoe Prov. Pk, Chapleau District and in Templeton Twp, Hearst District
<i>Croesus latitarsus</i> Nort. Dusky birch sawfly	wB	occasional colonies in Chapleau and Gogama districts
<i>Datana ministra</i> (Dru.) Yellownecked caterpillar	wB	light damage in Stimson Twp, Cochrane District
<i>Dioryctria reniculelloides</i> Mut. & Mun. Spruce coneworm	spruce	low populations through Cochrane, Hearst and Timmins districts
<i>Enargia decolor</i> (Wlk.) Aspen twoleaf tier	tA	low numbers in Walker Twp, Cochrane District
<i>Epinotia solandriana</i> Linn. Birch-aspen leafroller	wB, tA	common through Timmins and Kirkland Lake districts
<i>Eupareophora parca</i> (Cress.) Spiny ash sawfly	bAs	light upper crown defoliation in most stands in Kirkland Lake and Timmins districts
<i>Gilpinia hercyniae</i> (Htg.) European spruce sawfly	bS	low numbers in Haggart Twp, Cochrane District and in Shackleton Twp, Kapuskasing District
<i>Hemichroa crocea</i> (Geoff.) Striped alder sawfly	A1	light defoliation in Fauquier Twp, Kapuskasing District
<i>Hyphantria cunea</i> (Dru.) Fall webworm	deciduous	tents more common than in recent years but no important defoliation resulted

(continued)

Table 4. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Malacosoma californicum pluviale</i> Dyar Northern tent caterpillar	wB,Ch, W	common along roads and cutovers in Timmins, Kirkland Lake and Gogama districts
<i>Nematus limbatus</i> Cress. Willow sawfly	W	scattered colonies in Timmins and Kirkland Lake districts
<i>Neodiprion abietis</i> complex Balsam fir sawfly	bF,wS	low numbers in Mageau Twp, Chapleau District
<i>Neurotoma inconspicua</i> (Nort.) Plum webspinning sawfly	pCh	heavy defoliation in Ivanhoe Prov. Pk, Chapleau District
<i>Nymphalis antiopa</i> (L.) Mourningcloak butterfly	deciduous	isolated colonies in Timmins, Kirkland Lake and Hearst districts
<i>Petrova albicapitana</i> (Busck.) Northern pitch twig moth	jP	small numbers through Timmins, Chapleau, Kirkland Lake and Hearst districts
<i>Phratora purpurea purpurea</i> Brown Aspen skeletonizer	tA	varying numbers in most stands in Kirkland Lake District
<i>Phyllonorycter kenora</i> (Free.) Willow leafblotch miner	W	high populations in western portion of Stoddart Twp, Hearst District
<i>Phyllonorycter nipigon</i> (Free.) Balsam poplar leafblotch miner	bPo	low numbers in Ottaway and Clute twps, Cochrane District and at many points in Kirkland Lake and Timmins districts
<i>Pineus strobi</i> (Htg.) Pine bark adelgid	wP	Windbreaks attacked at Wakami Lake Prov. Pk, Chapleau District developed a 'gouty' appearance
<i>Pityokteines sparsus</i> (LeC.) Balsam fir bark beetle	bF	dead and dying trees heavily infested in Strathearn Twp, Chapleau District

(continued)

Table 4. Other forest insects (concluded).

Insect	Host(s)	Remarks
<i>Pristiphora erichsonii</i> (Htg.) Larch sawfly	tL	none found in 1983
<i>Psilocorsis reflexella</i> Clem. Twoleaf tier	tA	usually found in the complex of insects in aspen stands in the Kirkland Lake and Timmins districts
<i>Psylla floccosa</i> (Patch) False woolly alder aphid	A1	low numbers in Colquhoun Twp, Cochrane District and in Shackleton Twp, Kapuskasing District
<i>Tetralopha applastella</i> (Hlst.) Aspen webworm	tA	common throughout the eastern part of Kirkland Lake District and in Potter Twp, Cochrane District
<i>Toumeyella parvicornis</i> (Ckll.) Pine tortoise scale	jP	single trees and small groups of trees heavily infested in Wakami Lake Prov. Pk, Chapleau District and at several points in Kirkland Lake and Timmins districts
<i>Vasates quadripes</i> (Shim.) Maple bladdergall mite	siM	high numbers on ornamentals in towns of Iroquois Falls and Kapuskasing

TREE DISEASES

Major Diseases

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

This disease is easily identified by the fruiting stage of the fungus, which is the honey mushroom. Weakened or injured trees are commonly attacked by this fungus, which spreads from the roots of diseased trees and causes the wood around the root collar of the infected tree to rot.

Armillaria root rot evaluations were conducted at 17 locations but the presence of the disease was detected in only seven areas (Table 5). An average of 2.2% of the trees were affected in the seven locations in 1983, a slight decrease from 1982 when an average of 3.7% of the trees were affected.

Table 5. Summary of mortality caused by Armillaria root rot in four districts in the Northern Region in 1983 (counts based on the examination of 150 or 300 randomly selected trees at each location).

Location (Twp)	Host	Avg ht of trees (m)	Estimated trees per ha	Estimated area affected (ha)	Current mortality (%)
Chapleau District					
Dalmas	jP	3.7	3,000	50	8.0
Chappise	jP	3.0	3,000	27	2.0
Arbutus	jP	2.3	2,500	25	3.0
Gogama District					
Invergarry	jP	2.0	2,440	10	0.7
Hearst District					
Arnott	jP	1.9	2,600	50	0.7
*Cross	jP	1.1	2,550	220	0.3
Kapuskasing District					
Shearer	bS	2.2	3,962	40	0.7

*300-tree sample

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

This disease of trembling aspen was widespread and infection levels were comparable with those of the previous year. Diseased trees occurred singly or in small pockets of less than 1 ha. Defoliation varied from under 1% to 30%.

The disease is typified by one or more black spots on the leaf surface. The leaf may die and turn brown but will often remain attached until the fall. The fungus overwinters in the ink spots on the fallen leaves and spores produced from the spots will infect the new leaves in the spring.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

This stem rust of jack pine occurs where one or both of the two alternate hosts, sweetfern, *Comptonia peregrina* (L.) Coult., and sweet gale, *Myrica gale* L., are present. Trees are infected when young and are better able to resist infection when a basal diameter of 8 cm is attained. On seedlings and saplings the cankers can girdle the tree, causing mortality. The cankers can also contribute to wind breakage by weakening the stem; in addition, they provide an entrance for secondary insects and fungi.

Damage levels were generally low in the Region. There were two areas of high infection, one in Calvert Township, Cochrane District and the other in Invergarry Township, Gogama District (Table 6).

Table 6. Summary of damage caused by sweetfern blister rust in four districts in the Northern Region in 1983 (counts based on the examination of 150 randomly selected trees at each location).

Location (Twp)	Host	Avg ht of trees (m)	Estimated trees per ha	Estimated area affected (ha)	Trees affected (%)
Chapleau District					
Langlois	jP	19.0	6,000	20	5
Cochrane District					
Calvert	jP	20.0	2,200	10	20
Gogama District					
Invergarry	jP	18.0	1,525	10	15.2
Timmins District					
Murphy	jP	13.0	2,500	5	2
German	jP	12.0	2,500	2	2
Adams	jP	2.0	5,000	4	2

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

Previous quantitative sampling of jack pine regeneration in 1979 revealed that an average of 8% of the trees were infected. An average of 2% of the trees had stem galls. The percentage of trees infected remained the same in 1983 but the average percentage of trees with stem galls increased to 5% (Table 7).

Stem galls on small-diameter trees can cause deformation or tree mortality. Galls on lateral branches are capable of killing the part of the branch distal to the infection.

Table 7. Summary of damage caused by western gall rust on jack pine in three districts in the Northern Region in 1983 (evaluations based on the examination of 150 or 300 randomly selected trees at each location).

Location (Twp)	Avg ht of trees (m)	Estimated trees per ha	Estimated area affected (ha)	Trees affected (%)	Trees severely affected ^a (%)
Chapleau District					
*Bliss	1.4	2,424	60	0.3	0.3
*Gilliland	1.9	2,775	75	2.3	1.7
Gilliland	2.0	1,500	50	8.0	4.0
Neelands	1.9	1,500	10	27.0	19.0
Daoust	1.8	1,140	10	15.0	8.0
Cochrane District					
Dundonald	3.0	2,600	25	2.0	0
Hearst District					
Studholme	5.9	1,400	40	1.3	0

^a stem gall

*300-tree sample

Minor Diseases

Shoot Blight, *Venturia macularis* (Fr.) Müller & Arx
(= *Pollaccia radiosa* [Lib.] Bald. & Cif.)

Blackened leaves and curled shoots are typical symptoms of this disease (see photo, page 6). Repeated infections to the tree terminal can result in a club-top formation.

Fourteen areas were surveyed in 1979: an average of 41% of the trees were affected by this blight and an average of 25% of the terminals were damaged. The average number of trees affected remained constant in 1983 but terminal damage decreased to 7% (Table 8).

Table 8. Summary of damage caused by shoot blight of aspen in six districts in the Northern Region in 1983 (counts based on the examination of 150 randomly selected trees at each location).

Location (Twp)	Avg ht of trees (m)	Estimated trees per ha	Estimated area affected (ha)	Trees affected (%)	Terminal shoot mortality (%)
Chapleau District					
D'Arcy	2.0	6,000	5	8	2
Cochrane District					
Aurora	3.0	7,000	10	47	6
Sheldon	1.8	8,000	20	27	2
Hearst District					
Alderson	2.0	6,000	10	14	2
Wicksteed	2.0	8,500	20	18	7
Kapuskasing District					
Nansen	3.5	10,000	15	34	3
Fauquier	1.8	8,000	10	58	24
Kirkland Lake District					
Hilliard	2.0	8,000	3	60	3
Evanturel	2.0	5,000	1	80	4
Stock	3.0	5,000	5	75	9
Nordica	4.0	5,000	20	30	25
Corkill	3.0	5,000	50	50	2
Timmins District					
Whitney	3.0	5,000	4	100	6

Table 9. Other forest diseases.

Organism	Host(s)	Remarks
<i>Ceratocystis ulmi</i> (Buism.) C. Moreau Dutch elm disease	wE	numerous areas surveyed but no extension in range found in 1983
<i>Chrysomyxa ledi</i> (Alb. & Schw.) d By., <i>Chrysomyxa ledicola</i> Lagh. Spruce needle rusts	wS,bs	moderate-to-heavy infection levels in Chapleau and Gogama districts; light in other districts of the Region
<i>Coleosporium asterum</i> (Diet.) Syd. Pine needle rust	jP	Trees in a 50-ha plantation in Arnott Twp, Hearst District, were 100% infected and had 40% average defoliation; only light damage was found at other locations
<i>Cronartium comandrae</i> Pk. Comandra blister rust	.jP	one canker found in a plantation in Studholme Twp, Hearst District
<i>Cronartium ribicola</i> J.C. Fisch. White pine blister rust	wP	2% of trees affected on roadside regeneration in Stetham Twp, Gogama District
<i>Davisomycella ampla</i> (Davis) Darker Needle cast	jP	common but at low levels through Kirkland Lake, Timmins, Chapleau and Gogama districts
<i>Hypoxyylon mammatum</i> (Wahl.) J.H. Miller Hypoxyylon canker	tA	varying degrees of mortality through the Region
<i>Rhytisma salicinum</i> (Pers.) Fr. Tar spot	W	unusually high infections throughout Timmins, Kirkland Lake and Chapleau districts

Abiotic Damage

Wind Damage

Severe thunderstorms and accompanying high winds were responsible for a large area of blowdown in Kineras and Harewood townships in Cochrane District in early August. The area of damage was not a continuous swath but consisted of pockets of downed timber. The affected tree species were black spruce, aspen and white birch. The aspen trees tended to be broken off part way up the stem while the spruce trees were laid down intact. The affected area will be flown and examined by OMNR personnel in the spring.

Isolated single-tree blowdown caused by high winds was observed through the Cochrane, Hearst and Kapuskasing districts. Damage was most noticeable in cutovers where some residual trees were blown over, and along roadways or the fringes of stands.

Another area of blowdown occurred east of Biscotasi Lake, Biscotasi Township in Chapleau District sometime before July. Approximately 205 ha of white birch and trembling aspen were affected (see photo, page 6).

Special Surveys

Black Spruce Plantations

In 1983, a special survey was conducted to assess the impact of insect and disease problems in 14 black spruce plantations in the Northern Region (Fig. 6). Stand selection was based on three height classes: < 2 m, 2 m - 6 m and > 6 m. A random sampling procedure was used and 150 trees were examined in two visits during the periods 10-27 June and 14 July to 1 August. The stands were evaluated for the presence of the following selected insects, diseases and abiotic damage:

Insects: spruce budworm, spruce coneworm, yellowheaded spruce sawfly, white pine weevil and sawyer beetles, *Monochamus* spp.

Diseases: Armillaria root rot, spruce needle rust, cone rust, *Chrysomyxa pirolata* Wint., broom rusts, *C. arctostaphyli* Diet., and mistletoe, *Arceuthobium pusillum* Pk.

Abiotic Damage: frost

Insects and diseases not found in the survey were:

Insects: sawyer beetles

Diseases: Armillaria root rot, cone rust, broom rusts and mistletoe

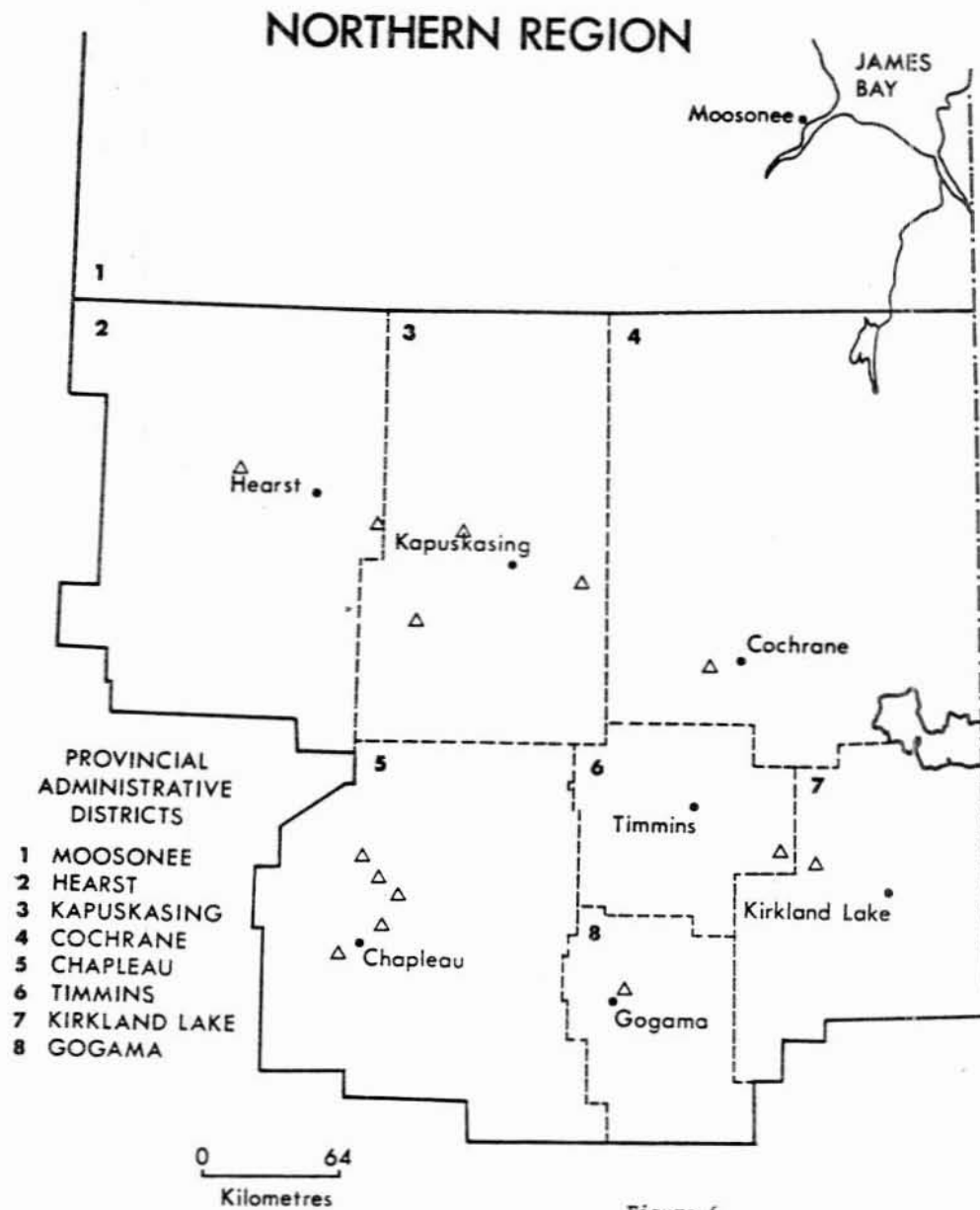


Figure 6

Black spruce (*Picea mariana* [Mill.] B.S.P.)
plantations surveyed in 1983 Δ

Survey results are summarized in Table 10.

The 1983 survey of black spruce revealed that no serious pest problem existed in any of the areas surveyed.

There were fewer pests encountered in the current survey than in the previous survey of black spruce plantations completed in 1980. In the previous survey 76% of the trees examined experienced defoliation by the spruce budworm while in the current survey this figure was 6%. In 1980 the average percentage of trees attacked by white pine weevil was 1.4%. Damage decreased to .24% over all in 1983. The most significant difference was in the percentage of trees affected by frost. In the previous survey 84% of trees examined experienced 21% foliar damage. On average, 8% of the trees examined in the current survey experienced less than 1% foliar damage.

Low populations of the spruce coneworm were encountered in five of the sample areas. Damage by this insect is similar to that caused by the spruce budworm. When the two occur together and when all the new foliage is consumed, the coneworm will often eat the budworm larvae.

Damage caused by the yellowheaded spruce sawfly was light in all but one area where it was detected. This pest prefers open-growing trees and heavy defoliation of young trees can result in mortality in one season.

Low numbers of white pine weevil were also recorded. This insect kills the terminal, damaging tree form and lessening the tree's commercial value.

Severe frost can kill new shoots and inhibit proper tree growth. However, the only area of significant frost damage occurred in Studholme Township, Hearst District.

Spruce needle rust is seldom a serious problem although heavy infections can cause premature defoliation.

Although spruce cone rust was not detected it has the ability to reduce the viability of the seeds.

Recorded damage by Armillaria root rot may be low but infection usually results in tree mortality.

Table 10. Summary of the results of a special survey of 14 areas of black spruce regeneration in the Northern Region in 1983 (counts based on the examination of 150 trees at each location).

Location (Twp)	Estimated stand area (ha)	Estimated no. of trees per ha	Ht class (m)	Spruce budworm		Yellowheaded spruce sawfly		White pine weevil	Spruce coneworm		Armillaria root rot
				Trees attacked (%)	Defolia- tion (%)	Trees attacked (%)	Defolia- tion (%)	Trees affected (%)	Trees attacked (%)	Defolia- tion (%)	Trees affected (%)
Chapleau District											
Brutus	71	3,000	2.1 - 6.0	0	0	0	0	0	0	0	0
Floranna	76	1,000	> 6.0	0	0	0	0	0	0	0	0
Panet	97	1,000	0.5 - 2.0	0	0	0	0	0	0	0	0
Panet	90	1,000	2.1 - 6.0	.7	< 1	0	0	0	0	0	0
Pattinson	93	1,000	0.5 - 2.0	0	0	0	0	0	0	0	0
Gogama District											
Jack	12	3,000	> 6.0	1.3	< 1	0	0	0	0	0	0
Kirkland Lake District											
McEvay	13	4,000	> 6.0	0	0	0	0	0	0	0	0
Stock	259	4,000	0.5 - 2.0	0	0	48	1.7	0	0	0	0
Cochrane District											
Fournier	20	2,200	0.5 - 2.0	0	0	2.7	< 1	1.3	.7	< 1	0
Hearst District											
Devitt	40	3,000	> 6.0	4	< 1	3.3	< 1	0	1.3	< 1	0
Studholme	25	2,100	2.1 - 6.0	48	< 1	0	0	.7	2.0	< 1	0
Kapuskasing District											
Idington	40	2,300	2.1 - 6.0	5.3	< 1	.7	< 1	.7	2.7	< 1	0
Opasatika	50	2,200	0.5 - 2.0	18.6	< 1	0	0	.7	1.3	< 1	0
Shackleton	10	3,000	> 6.0	0	0	0	0	0	0	0	0

(continued)

Table 10. Summary of the results of a special survey of 14 areas of black spruce regeneration in the Northern Region in 1983 (counts based on the examination of 150 trees at each location)(concluded).

Location (Twp)	Estimated stand area (ha)	Estimated no. of trees per ha	Ht class (m)	Frost		Needle rust		Cone rust	
				Trees affected (%)	Foliage damaged (%)	Trees affected (%)	Foliage damaged (%)	Trees affected (%)	Cones damaged (%)
Chapleau District									
Brutus	71	3,000	2.1 - 6.0	0	0	13	< 1	0	0
Floranna	76	1,000	> 6.0	0	0	24	9	0	0
Panet	97	1,000	0.5 - 2.0	0	0	0	0	0	0
Panet	90	1,000	2.1 - 6.0	0	0	15	< 1	0	0
Pattinson	93	1,000	0.5 - 2.0	0	0	6	< 1	0	0
Gogama District									
Jack	12	3,000	> 6.0	0	0	0	0	0	0
Kirkland Lake District									
McEvay	13	4,000	> 6.0	0	0	0	0	0	0
Stock	259	4,000	0.5 - 2.0	0	0	0	0	0	0
Cochrane District									
Fournier	20	2,200	0.5 - 2.0	0	0	6	< 1	0	0
Hearst District									
Devitt	40	3,000	> 6.0	0	0	43	< 1	0	0
Studholme	25	2,100	2.1 - 6.0	100	2	20	< 1	0	0
Kapuskasing District									
Idington	40	2,300	2.1 - 6.0	0	0	36	< 1	0	0
Opasatika	50	2,200	0.5 - 2.0	6	< 1	21	< 1	0	0
Shackleton	10	3,000	> 6.0	0	0	35	< 1	0	0

Black Spruce Seed and Cone Pests

As part of the special survey of black spruce, 100 cones were collected from each of two types of site locations at six points in the Region (Table 11). In late July cones were collected from an upland site and from a lowland site except in Kirkland Lake District, where both samples were removed from an upland site. The cones were taken from a minimum of three trees and sent to the Great Lakes Forest Research Centre for analysis. No diseased cones were found. The following insect pests were encountered in each of the cone dissections.

Spruce cone maggot, *Hylemya anthracina* (Czerny): The pupae overwinter in the ground litter. Adults emerge in the spring and lay eggs between the cone scales. Once hatched, the larvae tunnel spirally around the cone axis, causing considerable damage to the seeds (see photo, page 31). Larvae become full grown by mid-summer, tunnel out of the cone, and drop to the ground where they become pupae.

Spruce cone axis midge, *Dasineura rachiphaga* Tripp: The larvae overwinter inside a cocoon in the previous year's cones. They pupate in the spring and 10 days later an adult emerges and eggs are laid on the new cone. The hatched larva mines through scale tissue into the cone axis. About mid-summer the larva tunnels back near the scale surface and forms its cocoon. The seeds are not attacked directly (see photos, page 32); however, the connective tissue is damaged and this interrupts the nutrient supply to the developing seeds.

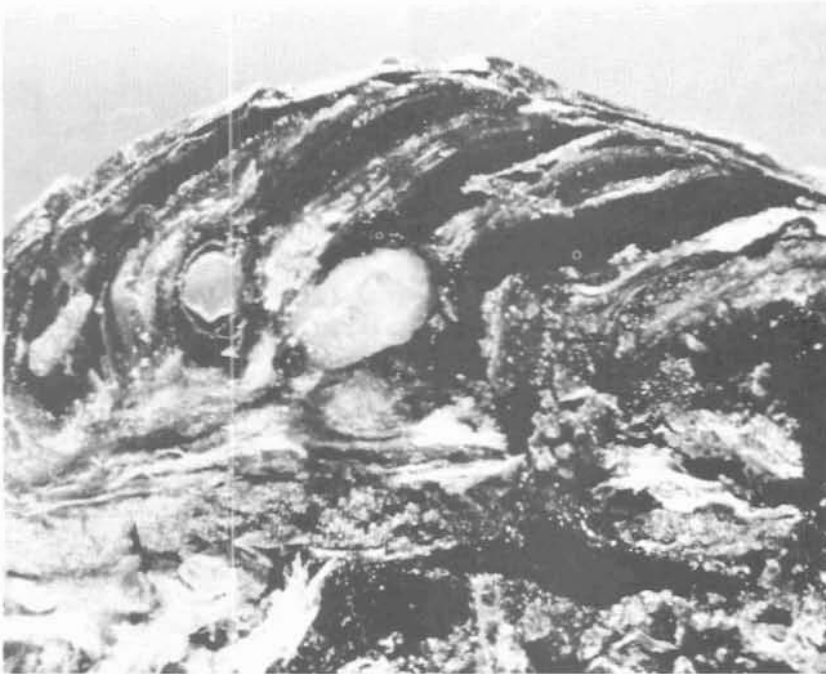
Other damage not specifically identified was caused by lepidopterous larvae, the adults of which are the moths and butterflies (see photo, page 31). The unknown damage encountered in the survey was caused by physical agents such as hail.

Permanent Jack Pine Sample Plots

In 1982, six permanent plots of 300 trees each were established in jack pine regeneration stands under 2 m. Disease and insect levels as well as terminal growth were monitored. These plots were re-examined in 1983. Two visits were made to each plot and the accumulated data were compiled for comparison with those of the previous year (Table 12).

The average terminal growth varied from .3 m to .54 m in the six areas examined. An increase in damage to the terminals was noted in the current survey. An average of .3% of the leaders were killed by the white pine weevil in 1982, and .8% were killed in 1983. Damage to terminals caused by the eastern pine shoot borer increased from .5% in 1982 to 2.1% in 1983. Low numbers of jack pine sawflies and jack pine tip beetles were again detected in the survey.

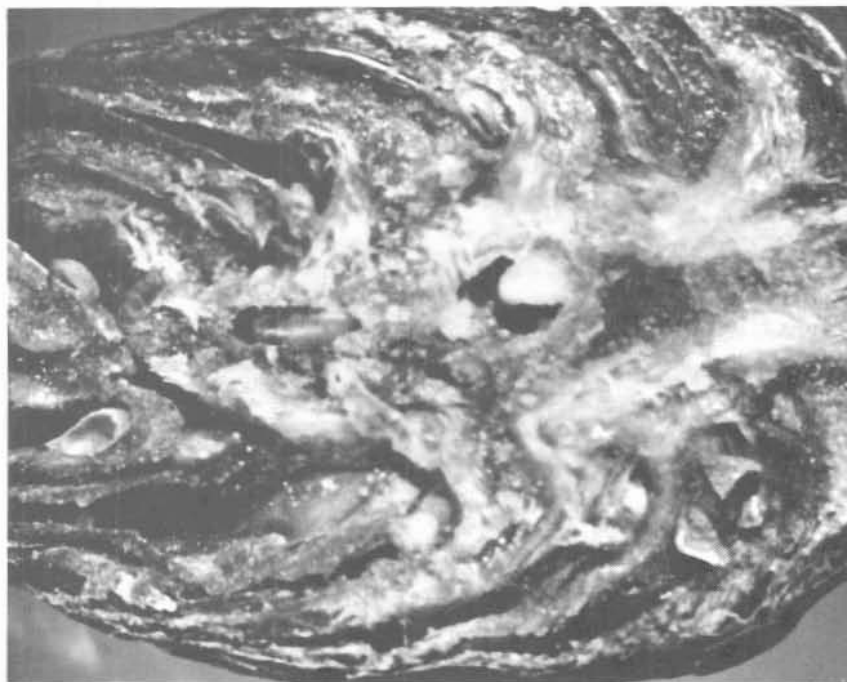
Damage caused by disease organisms was generally low. A slight increase was recorded in the incidence of *Armillaria* root rot and western gall rust. *Scleroderris* canker and tar spot needle cast could not be found.



Spruce cone maggot,
Hylemya anthracina
(Czerny), showing
typical damage to a
black spruce (*Picea*
mariana [Mill.] B.S.P.)
cone



External feeding dam-
age caused by miscel-
laneous lepidoptera



Pupae (left) and larvae of the spruce cone axis midge, *Dasineura rachi-phaga* Tripp, in black spruce (*Picea mariana* [Mill.] B.S.P.)

Black spruce cone axis damage caused by the spruce cone axis midge



Table 11. Summary of seed and cone damage in the Northern Region in 1983 (data based on the examination of 100 cones from each location).

Location (Twp)	No. of cones examined	Damaged cones (%)	Seed loss within damaged cones (%)	Site	Principal causes of seed loss
Chapleau District					
Brutus	100	25	7.5	lowland	<i>Hylemya anthracina</i> <i>Dasineura rachiphaga</i> Lepidopterous larvae Unknown agent
Panet	100	23	5.1	upland	<i>Hylemya anthracina</i> <i>Dasineura rachiphaga</i> Lepidopterous larvae
Kapuskaing District					
Beartooth Lake SPA	100	49	24.4	upland	<i>Hylemya anthracina</i> <i>Dasineura rachiphaga</i> Lepidopterous larvae Unknown agent
McCrea	100	69	47	lowland	<i>Hylemya anthracina</i> <i>Dasineura rachiphaga</i> Lepidopterous larvae Unknown agent
Kirkland Lake District					
Burt	100	17	5.5	upland	<i>Hylemya anthracina</i> <i>Dasineura rachiphaga</i> Unknown agent
Burt	100	40	9.5	upland	<i>Hylemya anthracina</i> <i>Dasineura rachiphaga</i> Lepidopterous larvae Unknown agent
Average	100	41%	19%		

Table 12. Summary of the results of a comparative survey of the permanent jack pine plots established in 1982 (counts based on the re-examination of 300 trees at each location).

Location (Twp)	Esti- mated stand area (ha)	Esti- mated no. of trees per ha	Avg ht of trees at end of growing season (m)		Jack pine sawfly				White pine weevil		Eastern pine shoot borer				Jack pine tip beetle			
					Trees affected (%)	Defoli- ation (%)	Trees affected (%)	Defoli- ation (%)	Trees affected (%)	1982	1983	Leaders attacked (%)	Laterals attacked (%)	Leaders attacked (%)	Laterals attacked (%)	Leaders attacked (%)	1982	1983
Chapleau District																		
Bliss	60	2,424	.97	1.44	0	0	0	0	.7	.3	.3	0	1	0	0	0	0	
Gilliland	75	2,775	1.36	1.89	0	0	0	0	.3	1	0	.3	5.3	1.3	.3	0	0	
Timmins District																		
Robb	50	2,900	.96	1.26	.3	10	.3	< 1	0	0	1.3	0	1	0	0	0	0	
Kirkland Lake District																		
Corkill	322	2,900	2.1	2.64	0	0	0	0	1.0	3.3	1.6	0	4.3	0	0	0	0	
Cochrane District																		
Sheldon	93	2,700	.43	.71	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hearst District																		
Cress	220	2,541	.71	1.07	0	0	0	0	0	0	0	0	.7	1	0	0	0	

(continued)

Table 12. Summary of the results of a comparative survey of the permanent jack pine plots established in 1982 (counts based on the re-examination of 300 trees at each location) (concluded).

Location (Twp)	Esti- mated stand area (ha)	Esti- mated no. of trees per ha	Avg ht of trees at end of growing season (m)		Armillaria root rot Trees affected (%)		Scleroderris canker Trees affected (%)		Western gall rust Trees affected (%)		Tar spot needle cast Avg defol- iation (%)		Pine needle rust Avg foliar damage (%)	
			1982	1983	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983
Chapleau District														
Bliss	60	2,424	.97	1.44	0	.3	0	0	0	.3	0	0	< 1	0
Gilliland	75	2,775	1.36	1.89	.3	.7	0	0	1	2.3	0	0	0	0
Timmins District														
Robb	50	2,900	.96	1.26	0	0	0	0	0	0	0	0	0	0
Kirkland Lake District														
Corkill	322	2,900	2.1	2.64	.3	0	0	0	0	0	0	0	0	0
Cochrane District														
Sheldon	93	2,700	.43	.71	0	0	0	0	0	0	0	0	0	0
Hearst District														
Cross	220	2,541	.71	1.07	0	.3	0	0	0	0	0	0	< 1	< 1

INSECT TRAPS

The presence and population levels of many insects are monitored by the use of traps. Moths are attracted by the use of light or a synthetic lure. Once the insect is within the trap it is killed by a Vapona-impregnated strip or becomes embedded in a sticky surface.

Spruce Budworm Pheromone Traps

A plastic funnel-type trap with a synthetic lure was used for the first time in 1983 to monitor population densities of the spruce budworm (see photo, page 37). Five traps were installed at nine locations in the Region. The male adults are attracted to the lure and killed by a Vapona-impregnated strip.

Gypsy Moth Pheromone Traps

Two traps were placed in 13 campgrounds in the Region to detect the presence of gypsy moth, *Lymantria dispar* (L.). This was part of an Ontario-wide survey in cooperation with Agriculture Canada. A sticky trap with a synthetic lure was used (see photo, page 37). Camping areas were selected because the eggs of this insect can be transported on vehicles travelling from infested areas. No captures of adult males were recorded in any of the parks.

Light Traps

These devices consist of a large metal container, a metal funnel and a fluorescent light (see photo, page 37). One trap was set up at Remi Lake Provincial Park and the other at the Chapleau Airport.

The moths are attracted by the light, drop down through the funnel and are killed by a Vapona-impregnated strip. The trap is emptied each day and the catch is sent to the Sault Ste. Marie laboratory for identification. The light trap serves to monitor the occurrence of mass flights of economically important insects.



Light trap



Gypsy moth, *Lymantria dispar* (L.),
pheromone trap



Spruce budworm, *Choristoneura fumiferana*
(Clem.), pheromone trap