

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

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Frontispiece. Fruiting of *Cronartium comptoniae* Arth. and canker on the
bole of a jack pine tree.

SURVEY HIGHLIGHTS

An unusually warm, dry spring favored high survival and rapid development of several species of forest insect defoliators. Consequently, insect damage to developing foliage was more severe and extensive than usual over much of the Region.

The spruce budworm was the most important pest, and infestations continued to expand. Detailed descriptions of defoliation, damage and forecasts for 1976 are combined with those of other regions in a report covering the entire province (Report O-X-250).

A major expansion of forest tent caterpillar infestations in the northern districts caused extensive defoliation of poplar. Large aspen tortrix infestations declined markedly but populations of other aspen leafrollers increased and severely defoliated many stands.

A primary objective of the pathology program in 1975 was to establish the distribution and impact of sweetfern blister rust in jack pine stands. Foliage diseases, which are monitored annually, were of minor importance this year, probably as a result of the relatively dry weather conditions which do not favor infection by most of these organisms.

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INSECTS

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

A general decline in populations of this species was noted in 1975. However, a spectacular rise in numbers of the leafroller, *Pseudexentera oregonana* Wlsh., occurred on trembling aspen (*Populus tremuloides* Michx.), particularly in the northern and eastern parts of the Region. To the casual observer it would appear that infestations of the large aspen tortrix continued much the same as in 1974 in the Kapuskasing, Cochrane, Timmins, and Kirkland Lake districts, since defoliation occurred in the same areas. However, the tortrix populations declined sharply and most of the defoliation was caused by the leafroller, *P. oregonana*. The most severe damage occurred in the central part of the Kapuskasing District; north of Cochrane and near Iroquois Falls in the Cochrane District; in the Timmins-Porcupine area, Timmins District; and in the Matheson and Long Lake-Kenogami Lake areas in the Kirkland Lake District (see Appendix, Fig. A1). In the Chapleau and Gogama districts both species were found in routine samples but little defoliation was observed.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

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

Larch Casebearer, *Coleophora laricella* Hbn.

Light defoliation of the upper crowns of tamarack (*Larix laricina* [Du Roi] K. Koch) recurred at the monitor plot in Fauquier Township, Kapuskasing District, where the casebearer has been relatively numerous for several years. Quantitative sampling at other locations through the Region showed that populations were low (Table 1).

Jack Pine Tip Beetle, *Conophthorus banksianae* McPherson

For the third consecutive year this insect caused conspicuous mortality of jack pine (*Pinus banksiana* Lamb.) shoots in young plantations through most of the Timmins District and at many points in the western part of the Kirkland Lake District. Later in the summer many of these shoots were broken off by the wind and damage became less noticeable. Quantitative sampling showed an average of three attacks

per tree in eight plantations where tree heights were 7 ft (2.1 m) or less. Although damage was detected through the Chapleau and Gogama districts, populations were generally light.

Table 1. Summary of larval counts of the larch casebearer in three districts in 1974-1975. (Counts were based on the examination of sixteen 18-in.^a branch tips at each location)

Location	Avg DBH of trees (in.) ^a	Total no. of larvae	
		1974	1975
Kapuskasung District			
Fauquier Twp	6	73	74
Cochrane District			
Haggart Twp	6	7	7
Clute Twp	6	23	15
Timmins District			
McKeown Twp	5	3	5
Keefer Twp	5	5	7

^a 1 in. = 2.54 cm

Birch Leafminer, *Fenusa pusilla* (Lep.)

Infestations of this miner were found at many points through the Region. In the western part, damage was confined to pockets of severely mined regeneration in the townships of Muskego, Chappise, Panet and Floranna, Chapleau District and in Asquith, Kelvin, and Benneweis townships, Gogama District. Farther east, in the Timmins and Kirkland Lake districts, mining was more extensive, damage to ornamental trees was particularly severe in urban areas, and defoliation levels of 75% were common. In the northern districts light mining was observed in McCoig Township, Hearst District; in Steele, Potter, Dempsey, Clute and Calder townships, Cochrane District; and in Fauquier Township in the Kapuskasing District.

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

Damage by this beetle was common at numerous locations through the southern parts of the Region. Pockets of moderate-to-severe defoliation of young trembling aspen were observed in the Chapleau District and at one point in Floranna Township a small stand sustained 80% defoliation. Moderate defoliation occurred in the Elk Lake, Charlton, Matheson and

Larder Lake areas of the Kirkland Lake District and in the Hoyle-Connaught areas of the Timmins District. No damage was observed in the four northern districts of the Region.

Aspen Blotch Miner, *Lithocolletis ontario* Free.

Unusually severe mining and conspicuous browning of aspen foliage were evident at many locations through the Timmins and Kirkland Lake districts. Mining was so severe, especially in aspen reproduction in cut-over areas, that discoloration of the foliage was clearly evident from the air. In the Chapleau District pockets of heavy infestation were observed in Strathearn, Eisenhower, Fingal, Edith, Lackner, Bernier and Daoust townships as well as in Stetham Township in the Gogama District.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Infestations of the forest tent caterpillar continued to increase in extent and intensity and 4,900 sq. miles (12,700 km²) of aspen forests in two separate infestations were severely defoliated in the Region.

The larger infestation, totalling approximately 4,600 sq. miles (11,900 km²), extended from Kohler Township, Hearst District, in a northeasterly direction through the northern part of the Kapuskasing District to Ebbit Township on the Moose River, Moosonee District, thence in a southerly direction to Smooth Rock Falls, Cochrane District, and west through the central parts of Kapuskasing and Hearst districts (see Appendix, Fig. A2).

A much smaller infestation of approximately 300 sq. miles (800 km²) recurred in the southern part of the Kirkland Lake District. This Thorneloe-New Liskeard infestation which has caused severe defoliation of aspen for 3 consecutive years expanded slightly in 1975. Minor extensions occurred along the northern boundary in the townships of Brethour, Pense, Evanturel and Dack and west into Robillard, Beauchamp and Cane townships. A major extension of severe defoliation occurred east of Lake Timiskaming and extended into the province of Quebec. The infestation was particularly severe in the New Liskeard area and caused much concern to property owners there (Fig. 1 and 2).

No damage by the caterpillars was observed in the Chapleau, Gogama or Timmins districts but moderate numbers of adult moths were found at a light trap operated at the Chapleau Tree Nursery.

Although the usual egg-band surveys were not conducted in the fall of 1975 it is expected, if spring weather is favorable, that the infestation in the northern districts will recur and probably expand

in 1976. Severe defoliation is again forecast for the New Liskeard-Thorneloe-Earlton areas (Table 2).

Table 2. Summary of forest tent caterpillar egg-band counts in the Kirkland Lake District in 1975 and infestation forecasts for 1976

Location (Twp)	Avg DBH of trees (in.) ^a	No. of trees sampled	Total no. of egg bands	Infestation forecast for 1976
James	5	3	1	trace
Evanturel	4	1	24	heavy
Ingram	4	1	24	heavy
Pense	4	1	19	heavy
Casey	5	1	32	heavy
Harley	4	1	11	heavy
Playfair	6	3	0	nil
Bowman	6	3	2	trace
Carr	6	3	0	nil
Taylor	6	3	2	trace

^a 1 in. = 2.54 cm



Fig. 1. Full-grown larvae of the forest tent caterpillar, a defoliator of trembling aspen.



Fig. 2. Extensive defoliation by the forest tent caterpillar as observed in late June.

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex

A sharp increase in population levels of this sawfly was noted in all districts of the Region. Severely defoliated jack pine trees were common, particularly in plantations in Kapuskasing, Timmins and Kirkland Lake districts. Higher populations were also evident in the Chapleau and Gogama districts but damage was confined to small pockets of defoliation in Busby and Garnet townships, Chapleau District.

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

Heavy damage to white spruce (*Picea mariana* [Mill.] B.S.P.) plantations, snow hedges, ornamentals and open-grown trees recurred through the northern and eastern parts of the Region, resulting in appreciable mortality of smaller trees.

Severe defoliation of ornamentals was observed in the towns of Hornepayne, Hearst, Kapuskasing, Smooth Rock Falls, Cochrane and Iroquois Falls. Regeneration along the Chain of Lakes and Kipling Dam roads in the Kapuskasing District sustained moderate damage.

In the Timmins and Kirkland Lake districts severe defoliation was common along highways 101 and 11 from Timmins to New Liskeard and along Highway 65 east and west of New Liskeard. White spruce trees in old fields near Charlton, Englehart and Elk Lake were attacked for the third year and mortality was high at several points in these areas.

White Pine Weevil, *Pissodes strobi* (Peck)

Leader damage by this pest of pine and spruce regeneration ranged from 1% to 14% at monitor plots through the Region (Table 3).

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Generally, populations of the larch sawfly remained at low levels throughout the Region. Light defoliation of tamarack stands was evident at many points along the Chain of Lakes Road, the Gargill Road, and the Gurney and Fergus roads in the Kapuskasing District. Light defoliation also occurred along the Wade Lake Road, Cochrane District, in Garvey Township, Gogama District, and in Muskego Township, Chapleau District. In the Timmins and Kirkland Lake districts heavy damage to the upper crowns of larch was noted at many locations during aerial surveys, and subsequent ground checks revealed that, particularly in the Kirkland Lake District, much of the damage was caused by heavy infestations of the spruce budworm.

Table 3. Summary of tree damage caused by the white pine weevil in six districts in 1975. (Counts were based on the examination of 100 trees at each location)

Location	Host	Avg height (ft.) ^a	Trees weeviled (%)
Cochrane District			
Potter Twp	wS	6	4
Calder Twp	bS	6	2
Kapuskasig District			
Fauquier Twp	wS	6	14
Casselman Twp	bS	6	6
Cumming Twp	wS	5	9
Gurney Twp	bS	6	6
Fergus Twp	wS	5	11
Timmins District			
Thorneloe Twp	jP	7	4
Jamieson Twp	jP	6	2
Timmins	jP	4	3
Kirkland Lake District			
Beauchamp Twp	jP	8	4
Catherine Twp	jP	5	2
Cane Twp.	jP	6	4
Cairo Twp	jP	7	5
Dunmore Twp	jP	6	5
Bowman Twp	jP	5	1
McEvay Twp	jP	6	4
Gogama District			
Benneweis Twp	jP	6	3
Noble Twp	jP	7	6
Roblin Twp	jP	7	3
Chapleau District			
Neelands Twp	jP	7	1
Deans Twp	jP	8	2
McNaught Twp	jP	12	2
Dupuis Twp	jP	7	5
Dalmas Twp	jP	8	4
Fawn Twp	jP	4	5
Nimitz Twp	jP	7	4
Lloyd Twp	jP	7	4
Lynch Twp	jP	9	7

^a 1 ft. = 30.48 cm

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

A recurrence of high population levels resulted in moderate-to-severe defoliation of mountain ash (*Sorbus* sp.) through the districts of Chapleau, Gogama, Timmins and Kirkland Lake. In the northern districts defoliation by the insect was found less frequently, with the most northerly occurrence in Kipling Township, Kapuskasing District. The most severe damage occurred to ornamental trees in the urban areas of Timmins, Kirkland Lake and New Liskeard.

Table 4. Other forest insects

Insect	Host(s)	Remarks
<i>Acrobasis betulella</i> Hlst.	wB	general decline in numbers throughout the Region
<i>Anacampsis innocuella</i> Zell.	tA	low numbers in Joffree Twp and at Five Mile Lake Provincial Park, Chapleau District
<i>Anomogyna elimata</i> Gn.	jP	trace populations, Edith Twp, Chapleau District
<i>Aphrophora parallela</i> (Say)	jP	generally low numbers in Region; high number of spittlemasses at one point in Truax Twp, Kirkland Lake District
<i>Archips cerasivoranus</i> (Fitch)	cCh	low populations along C.N.R. tracks, Kapuskasing District and in Daoust Twp, Chapleau District
<i>Cenopsis pettitana</i> Rob.	sM, rM moM	common at several points in the southern parts of Chapleau and Gogama districts
<i>Choristoneura pinus pinus</i> Free.	jP	found more frequently than in 1974; light populations in Burt, Beauchamp and Nordica twp, Kirkland Lake District; Westbrook Twp, Gogama District; Sandy, Fawn, Birch and Cassidy twp, Chapleau District

Table 4. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Choristoneura rosaceana</i> Harr.	tA, wB	low numbers through Chapleau and Gogama districts
<i>Chrysomela</i> spp.	Al, W bPo	pockets of medium-to-high damage in Benton, Penhorwood and Strathearn twp, Chapleau District
<i>Compsolechia niveopulvella</i> Cham.	tA	unusually high numbers in Benoit Twp, Kirkland Lake District; also found in Birch and Sandy twp, Chapleau District
<i>Croesus latitarsus</i> Nort.	wB	light populations in Case Twp, Cochrane District
<i>Dasineura balsamicola</i> (Lintn.)	bF	widely distributed through Kirkland Lake and Timmins districts
<i>Dioryctria abietivorella</i> Grt.	bS	common in cones at Spruce Falls Nursery, Fauquier Twp, Kapuskasing District
<i>Dioryctria reniculelloides</i> M. & M.	wS	appreciable defoliation at several points, Timmins District
<i>Epinotia solandriana</i> Linn.	wB, yB Al	low numbers through Chapleau and Kirkland Lake districts
<i>Erannis tiliaria</i> Harr.	wB, yB moM	much more common in 1975, especially in the south-western part of the Chapleau District
<i>Hemichroa crocea</i> (Four.)	Al	light-to-moderate defoliation from Kapuskasing to Smooth Rock Falls in the Kapuskasing-Cochrane districts and in Kelvin Twp, Gogama District

Table 4. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Heterarthrus nemoratus</i> (Fall.)	wB	varying numbers in most stands examined in the Timmins and Kirkland Lake districts
<i>Ipimorpha pleonectusa</i> Grt.	tA	numerous at one point in Tisdale Twp, Timmins District
<i>Malacosoma californicum pluviale</i> Dyar	pCh, W wB	widely distributed along roads and cut-over areas in all districts
<i>Meroptera pravella</i> Grt.	tA	common in most stands in Timmins and Kirkland Lake districts; lower incidence through Gogama and Chapleau districts
<i>Monochamus scutellatus</i> (Say)	bS, wS jP	heavy infestation in log stock piles, Newaygo Lumber Co., Mead, Hearst District
<i>Nematus limbatus</i> Cress.	W	widespread occurrence in Chapleau District; moderate defoliation of fringe trees in Floranna and Lloyd twp
<i>Neodiprion abietis</i> complex	bF	collected in quantitative sampling in Lowther Twp, Hearst District and in Homuth and Potter twp, Cochrane District
<i>Neodiprion nanulus nanulus</i> Schedl	rP, jP	colonies at several locations in most districts; moderate population at one point in Grenfell Twp, Kirkland Lake District and on open-grown trees in Kipling Twp, Kapuskasing District
<i>Neodiprion nigroscutum</i> (Midd.)	jP	single colony at one point in Whigham Twp, Chapleau District
<i>Neurotoma inconspicua</i> (Nort.)	pCh	appreciable defoliation of small trees at many points in Timmins and Kirkland Lake districts

Table 4. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Nycteola frigidana</i> Wlk.	W	common in Calder Twp, Cochrane District
<i>Orthosia hibisci</i> Gn.	Po, wB	quite common in most districts; numerous in James and Bowman twp, Kirkland Lake District
<i>Petrova albicapitana</i> (Busck.)	jP	high numbers in Robb and Thorneloe twp, Timmins District; varying numbers elsewhere
<i>Phratora purpurea purpurea</i> Brown	tA	conspicuous damage in Jamieson and Stock twp, Timmins District and in Reaney, Eisenhower and Foleyet twp, Chapleau District; low numbers in Iroquois Falls area
<i>Profenusa thomsoni</i> (Konow)	wB	low levels in McCoig Twp, Hearst District and through Timmins and Kirkland Lake districts; moderate in Foleyet Twp, Chapleau District
<i>Pseudaletia unipuncta</i>	jP	although basically not a forest pest this armyworm infested jack pine tubelings at the Swastika Nursery
<i>Psilocorsis reflexella</i> Clem.	tA	common at one point in Hoey Twp, Chapleau District
<i>Rhynchaenus rufipes</i> Lec.	W	severe defoliation of ornamental trees in Elk Lake, Kirkland Lake District
<i>Sciaphila duplex</i> Wlsham.	tA	associated with other poplar defoliators around Remi Lake, Kapuskasing District; at many points in Chapleau District and in Tisdale Twp, Timmins District

Table 4. Other forest insects (concluded)

Insect	Host(s)	Remarks
<i>Tetralopha aplastella</i> Hlst.	tA	common through Kirkland Lake, Chapleau and Gogama districts
<i>Toumeyella numismaticum</i> (P. & M.)	jP	small groups of trees heavily damaged at several points in Timmins and Kirkland Lake districts
<i>Xylomyges dolosa</i> Grt.	tA	common in northern part of Kirkland Lake District; low numbers in Chapleau and Gogama districts
<i>Zeiraphera improbana</i> (Walker)	tL	small numbers in Fauquier Twp, Kapuskasing District

TREE DISEASES

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Moreau

No major extension in the range of this disease could be determined in the Region since 1973 when *C. ulmi* was cultured from samples submitted from Englehart in the Kirkland Lake District. Disease symptoms were evident where elm was present.

Needle Rust of Spruce, *Chrysomyxa ledi* (Alb. & Schw.) dBy.
and *Chrysomyxa ledicola* Lagh.

Black spruce and white spruce were infected by these rusts at varying levels through the Region (Table 5). Moderate defoliation of white spruce was recorded at two locations in Owens and Cargill townships in the Kapuskasing District. Light defoliation occurred in Bourinot, Parnell, Fergus and Fauquier townships in the Kapuskasing District; in McCoig Township, Hearst District; in Nimitz and Birch townships, Chapleau District; and in Flavelle Township, Kirkland Lake District. In other stands the disease was absent or trace.

Table 5. Summary of light and moderate spruce needle rust appraisals in four districts in 1975.

Location	Acres affected ^a	Defoliation level	Trees affected (%)
Kapuskasing District			
Owens	500	moderate	100
Cargill	500	moderate	100
Bourinot	200	light	80
Parnell	200	light	100
Fergus	200	light	100
Fauquier	200	light	100
Hearst District			
McCoig	100	light	30
Chapleau District			
Nimitz	100	light	85
Birch	5	light	80
Kirkland Lake District			
Flavelle	10	light	62

^a 1 acre = 0.4 ha

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

There was a general decline in the incidence of this disease in the Region in 1975. Observations were made where defoliation was most evident in the districts of Gogama and Kirkland Lake: it was moderate at two locations, and low elsewhere (Table 6). Seventeen other observations showed trace conditions and many more revealed no infection.

Table 6. Observations of ink spot of aspen where defoliation was light or moderate in 1975

Location (Twp)	Acres affected ^a	Defoliation level	Trees affected (%)
Gogama District			
Asquith	50	light	100
McMurchy	25	moderate	100
Noble	50	light	100
Kirkland Lake District			
Hearst	50	light	100
Lebel	50	light	100
McGarry	50	light	100
Nicol	50	light	100
Tudhope	100	moderate	100
Tyrell	50	light	80

^a 1 acre = 0.4 ha

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

This needle rust caused moderate defoliation in a 5-acre (2.02-ha) jack pine plantation in Avon Township, Cochrane District and in a 20-acre (8.10-ha) jack pine plantation in Studholme Township, Hearst District for the fourth consecutive year. These were the only two locations at which the disease was observed.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

In 1975, a survey was carried out to determine the distribution and the percentage of pines affected. The disease occurs wherever both alternate hosts, sweetfern (*Comptonia peregrina* [L.] Coult.) and sweet gale (*Myrica gale* L.), are found. However, where sweetfern was absent the organism was present in low numbers or absent altogether (Table 7).

Table 7. Summary of sweetfern blister rust evaluations in seven districts in 1975

Location (Twp)	Tree height (ft) ^a	Size of stand examined (acres) ^b	Percent affected
Chapleau District			
Chappise	59c	750	22
Esther	69c	1000	12
Fitzsimmons	52c	500	0
Hutcheon	64c	500	34
Neelands	59c	1000	6
Nimitz	44c	2500	2
Cochrane District			
Avon	40	500	0
Dempsay	41	1000	0
Stimson	48	50	0
Gogama District			
Arden	54c	1000	10
Garvey	52c	500	5
Stetham	45c	500	9
Hearst District			
Wickstead	40	500	0
Kapuskasing District			
Kipling	41	500	0
Lisgar	61	50	0
Kirkland Lake District			
Garrison	53c	500	11
Kimberly	61c	800	14
Lebel	33c	500	28
Timmins District			
Denton	71	100	0
Murphy	54c	200	24

^a 1 ft = 30.48 cm

^b 1 acre = 0.4 ha

^c indicates sweetfern present

Sweetfern is not known to occur above a latitude of 49° N and the survey failed to detect the disease in the districts of Hearst, Kapuskasing and Cochrane. The percentage of trees affected at 20 locations averaged 8.8 with a high of 34%; on plots where sweetfern was present, the percentage of trees affected was 13.6. Trees that had been infected continually from year to year developed severe damage in the form of basal stem cankers (see Frontispiece).

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

Although this gall-forming rust was widely distributed through the Region, the percentage of jack pine trees infected was generally relatively low. However, in Avon and O'Brien townships in the Cochrane and Kapuskasing districts 38% and 40% of the trees in two plantations were infected. In Vrooman Township, Gogama District 13% of the trees showed rust galls with light damage.

Red Pine Shoot Blight, *Sirococcus strobilinus* Preuss.

This disease was found in a small stand of understory red pine (*Pinus resinosa* Ait.) trees at Weshago Lake, Chapleau District in 1973. Since that time an annual check has been made on the stand and there has been no change in the status of the disease. The organism has not been found at any other location in the Region.

Abiotic Conditions

Hail Damage

A severe hailstorm caused appreciable damage to balsam fir (*Abies balsamea* [L.] Mill.) trees in a strip 7 miles long and 1 mile wide (18 km²) in Barker Township, Kapuskasing District.

Needle Droop

This condition was observed in two small plantations in Kelvin and Cabot townships, Gogama District and in a large mixed plantation in Dupuis Township, Chapleau District. Only red pine trees were affected and some mortality occurred. A few red pine trees were lightly affected in Cairo Township, Kirkland Lake District.

Wind Damage

High winds caused heavy damage in jack pine and aspen stands in Kipling Township, Kapuskasing District and moderate damage near Charlton and Larder Lake in the Kirkland Lake District.

Winter Drying

Some damage to planted red pine trees was observed in Mead Township, Hearst District and in Fauquier Township, Kapuskasing District. This condition was of little consequence elsewhere in the Region.

The following conditions were not observed to be causing notable damage in the Region in 1975: drought, frost, scorch and semi-mature tissue needle blight.

Other Important Diseases

No new information is available on the following important tree diseases of the Region.

Armillaria mellea (Vahl ex Fr.) Kummer - Shoestring root rot
Arceuthobium pusillum Peck - Eastern dwarf mistletoe
Cronartium ribicola J.C. Fischer - White pine blister rust
Gremmeniella abietina (Lagerb.) Morelet - Scleroderris canker of pine
Hypoxylon mammatum (Wahl.) Miller - Hypoxylon canker of poplar
Polyporus tomentosus Fr. - Root and butt rot
Cronartium coleosporioides Arth. complex - Stalactiform rust
Cronartium comandrae Pk. - Comandra rust
Chrysomyxa arctostaphyli Diet. - Yellow witches' broom on black spruce
Melampsorella caryophyllacearum Schroet. - Yellow witches' broom on balsam
 fir

Scleroderris canker of pine and the root rots *A. mellea* and *P. tomentosus* were reported on in some detail in 1974.

APPENDIX

NORTHERN REGION

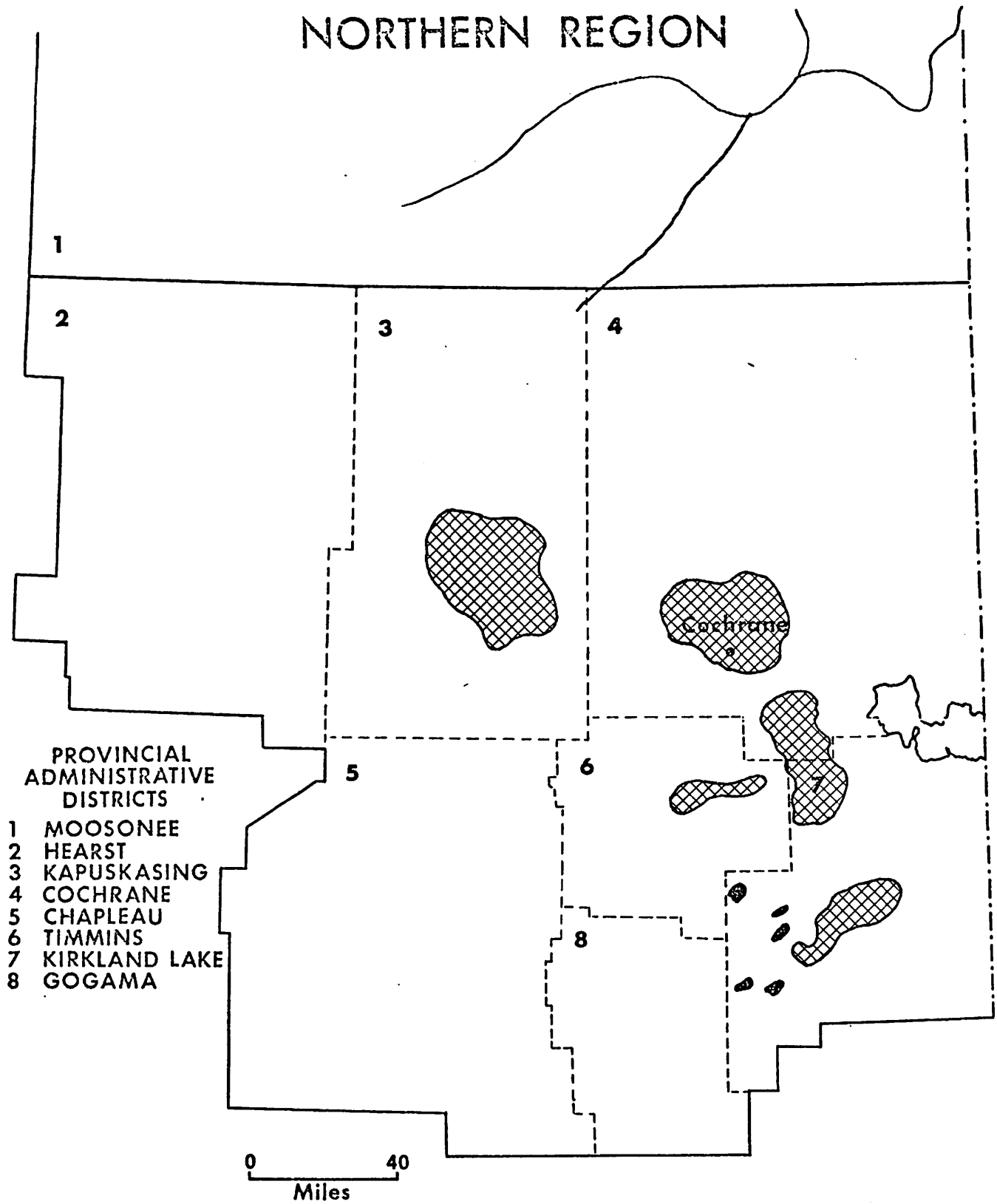


Fig. A1. POPLAR LEAFROLLER

Areas within which moderate-to-severe defoliation of trembling aspen occurred in 1975



NORTHERN REGION

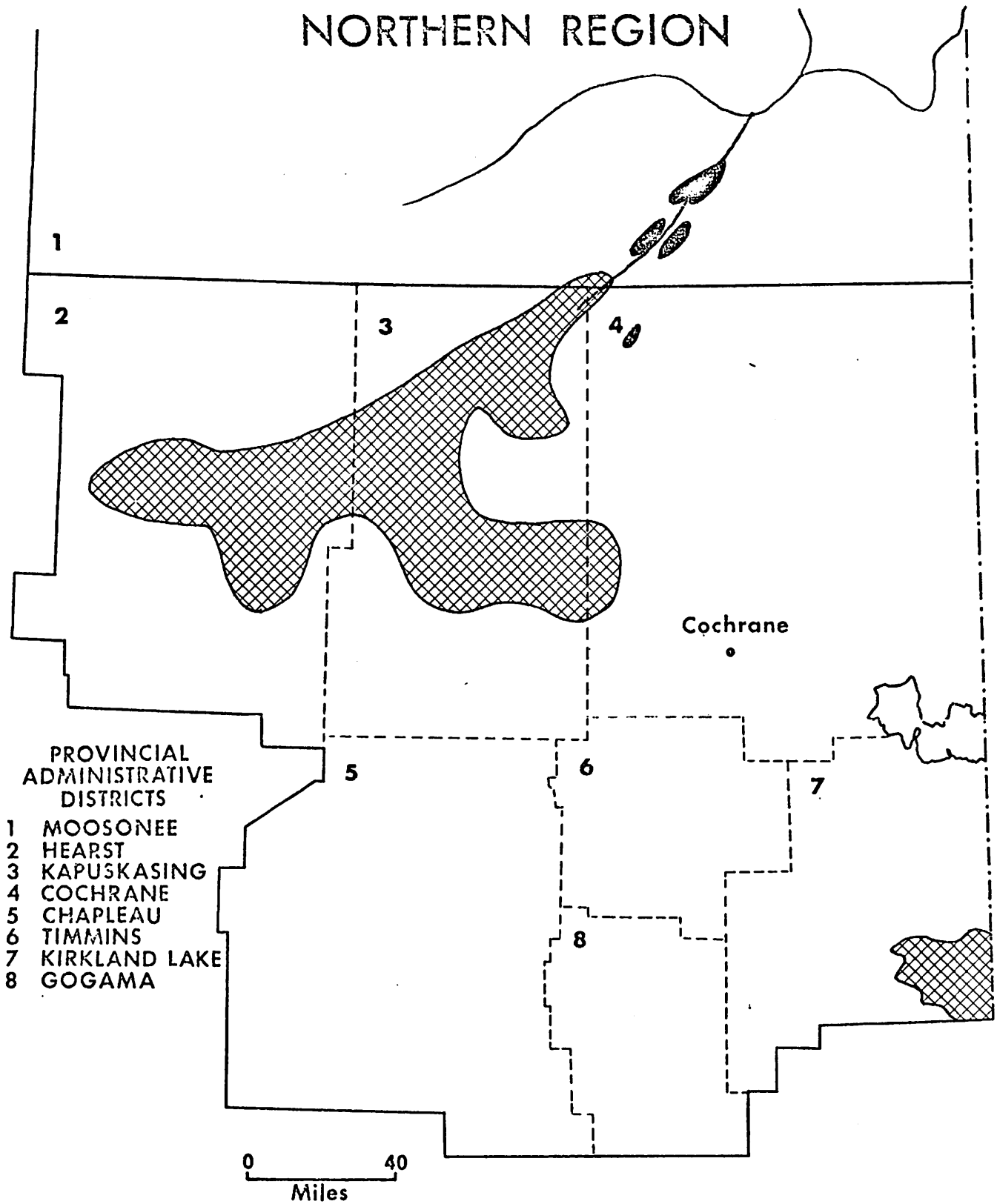


Fig. A2. FOREST TENT CATERPILLAR

Areas within which moderate-to-severe defoliation of trembling aspen occurred in 1975

