FOREST INSECT AND DISEASE SURVEYS IN THE NORTHERN REGION OF ONTARIO, 1976

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Frontispiece

Globular masses of blackened leaves on trembling aspen caused by poplar gall mite, *Eriophyes* sp.

Extensive defoliation by the aspen leafroller, *Pseudexentera oregonana* Wlshm., as seen from the air.

SURVEY HIGHLIGHTS

Abnormally high temperatures in mid-April were followed by cold periods and late spring snowstorms. These conditions influenced survival and development of some insect defoliators, particularly in the southern part of the Northern Region.

Spruce budworm infestations continued at high levels and expanded to the north and east as predicted in the fall of 1975. Mortality of balsam fir increased markedly in the older parts of the outbreak. Detailed descriptions of defoliation and damage, and forecasts for 1977, are combined with those of other regions in a separate report.

The forest tent caterpillar infestation in the southeastern part of the Region was dampened by extreme weather conditions and little defoliation resulted. The huge infestation in the northern districts was unaffected by unfavorable weather and a major expansion of over 13,000 km^2 (5,000 sq. mi.) occurred. Aspen leafroller infestations also caused extensive defoliation of poplar stands totalling almost 1,800 km^2 (700 sq. mi.).

Infestations of some relatively unimportant forest insects were found in 1976. These were the maple leafroller and the eastern pine shootborer in the Chapleau District and the poplar gall mite in the Kirkland Lake District.

The pathology program for 1976 placed special emphasis on surveys of foliage diseases of both conifers and deciduous species. The relatively dry weather conditions which seemed to inhibit development of many disease-causing organisms resulted in incomplete data in these surveys.

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The generous assistance and excellent cooperation extended by personnel of the Ontario Ministry of Natural Resources in all districts of the Region during the field season are gratefully acknowledged.

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INSECTS

Maple Leafroller, *Cenopis pettitana* Rob.

Population levels of this insect were unusually high on all species of maple (*Acer* spp.) over much of the Chapleau and Gogama districts in 1976. The heaviest damage was evident in the southwest corner of the Chapleau District where moderate-to-severe defoliation occurred on sugar maple (*Acer saccharum* Marsh.). In this area the infestation was limited to high upland sites because of the scattered occurrence of the host species. Leafroller damage caused sufficient discoloration to be easily detected from both the ground and the air.

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-260). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1976 and gives infestation forecasts for the province for 1977.

Larch Casebearer, *Coleophora laricella* Hbn.

Records taken annually at a permanent sample plot in Fauquier Township, Kapuskasing District, show that a relatively high population persisted there from 1971 to 1975. The infestation collapsed completely in 1976 and only two empty cases were found. Quantitative sampling (Table 1) disclosed the presence of very low populations in the Cochrane, Kirkland Lake and Timmins districts and the casebearers could not be found in the Chapleau and Gogama districts.

Table 1. Summary of larval counts of the larch casebearer in three districts in 1975-1976. (Counts were based on the examination of sixteen 45-cm (18-in.) branch tips at each location.)

Location (Twp)	Avg DBH of trees (cm)[a]	Total no. of larvae 1975	1976
Cochrane District			
Haggart	15	7	1
Clute	15	15	2
Timmins District			
McKeown	13	5	3
Keefer	13	7	1
Kirkland Lake District			
Grenfell	8	-	1
Flavelle	8	-	2

[a] 1 cm = 0.39 in.

Jack Pine Tip Beetle, *Conophthorus banksianae* McPherson

This insect again caused conspicuous damage in jack pine (*Pinus banksiana* Lamb.) plantations in the Timmins and Kirkland Lake districts. Quantitative sampling in five large plantations showed an average incidence of almost 28% with an average of 2.4 attacks per infested tree. Although shoot mortality was widespread in the Chapleau and Gogama districts population levels were generally low and damage was light. The beetle was not found elsewhere in the Region.

Poplar Gall Mite, *Eriophyes* sp.

An unusually heavy infestation of this mite occurred in trembling aspen (*Populus tremuloides* Michx.) stands in the Earlton-New Liskeard area, Kirkland Lake District. The dwarfed, shrunken foliage was striking, and heavily infested trees became unsightly with large globular masses of blackened leaves (see Frontispiece). Some trees were more heavily infested than others within the same stand and all infested stands were located in an area which had suffered three successive years of severe defoliation by the forest tent caterpillar.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

A marked increase in numbers of this insect was recorded in the Gogama District and in the southern part of the Chapleau District. Plantations of jack pine 1.5-3 m high were most commonly affected in this area. This shoot borer prefers the upper portion of the tree; infested shoots discolor and either bend over or break off. When the main leader is killed a lateral shoot becomes dominant and a crooked stem results. The highest incidence of attacked leaders was 21% (Table 2) which occurred in Benneweis Township, Gogama District.

Table 2. Summary of leader damage on jack pine by eastern pine shoot borer in Chapleau and Gogama districts in 1976. (Counts were based on the examination of 100 trees at each location.)

Location (Twp)	Avg height (m)[a]	Leaders affected (%)
Gogama District		
Benneweis	2.1	21
Roblin	2.4	8
Noble	2.7	2
Chapleau District		
Dupuis	2.4	5
Deans	2.4	5
Arbutus	1.5	8
Fawn	1.5	10

[a] 1 m = 3.28 ft

Birch Leafminer, *Fenusa pusilla* (Lep.)

Infestations of this miner, though varying in size, were found in most districts of the Region. In Chapleau and Gogama districts damage was generally light, with severe defoliation confined to smaller trees along roads and in clear-cut areas. In Timmins and Kirkland Lake districts severe mining was noted at many locations and in some instances in urban areas the foliage of ornamental trees was completely destroyed, particularly in Kirkland Lake, Gowganda and Timmins. Infestation levels were similar in the Kapuskasing District where severely mined trees were observed in a park in Kapuskasing and along the Chain of Lakes Road. Pockets of light-to-moderate damage also occurred in the Smooth Rock Falls and Cochrane areas.

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

Pockets of moderate-to-severe defoliation of aspen recurred at many locations in the Timmins and Kirkland Lake districts. Defoliation was confined mainly to the upper third of the crowns in reproduction type stands. The largest area of severe defoliation occurred in Black Township in the central part of Kirkland Lake District where approximately 4 ha (10 acres) of trees were heavily infested with the beetles. In Chapleau District populations were generally light with small pockets of moderate defoliation in Calais and Deans townships. No damage was observed in other districts in the Region.

Aspen Blotch Miner, *Lithocolletis ontario* Free.

Extensive mining of aspen foliage recurred at numerous points through the southern part of the Region. Infestations varied from light to heavy through the Chapleau and Gogama districts and heavy defoliation occurred in the southern part of both districts, particularly along Highway 129 south of Chapleau and along Highway 144 south of Gogama. Severe browning of foliage occurred through the western parts of Timmins and Kirkland Lake districts.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Spectacular changes occurred in the two forest tent caterpillar infestations in the Region.

In the smaller infestation located in the Earlton-New Liskeard area of the Kirkland Lake District populations decreased sharply and defoliation was confined to a few small pockets in Dack, Evanturel, Harley and Casey townships. The decline was attributed mainly to unusual spring weather conditions. Extremely high temperatures which occurred in mid-April, apparently causing eggs to hatch, were followed by a long cold period which delayed foliage development and resulted in the starvation of large numbers of the caterpillars.

The huge infestation in the Hearst, Kapuskasing, Cochrane and Moosonee districts (see Appendix, Fig. A1) was unaffected by weather

conditions and continued to expand. Infestation boundaries extended from Cross Township, Hearst District, northeast to Parr Township near Moosonee and south to Machin Township east of Kapuskasing. This represented an increase of approximately 13,250 km^2 (5,100 sq. mi.) and the area of severe defoliation covered a total of 25,170 km^2 (9,700 sq. mi.).

Egg-band counts made at 16 locations outside the infestation suggest a potential for further expansion in 1977 (Table 3). High numbers were found at Kesagami Lake, Moosonee District and in Blakelock Township, Cochrane District, approximately 100 km (65 mi.) east of the present boundary, indicating a major extension in that direction.

Table 3. Summary of forest tent caterpillar egg-band counts in five districts in 1976 and infestation forecasts for 1977

Location (Twp)	Avg DBH of trees (cm)[a]	No. of trees sampled	Total no. of egg bands	Infestation forecast for 1977
Hearst District				
Kohler	15	3	1	light
McCoig	15	3	2	light
McMillan	18	3	5	light
Kapuskasing District				
Shackleton	13	3	2	light
Carmichael	15	3	3	light
Ford	15	3	0	nil
Casselman	15	3	1	light
Stringer	13	3	2	light
Shanly	15	3	2	light
Bourinot	15	3	4	light
Fauquier	20	1	98	severe
Cochrane District				
Syderre	15	3	2	light
Haggart	13	3	2	light
Findley	15	3	3	light
Blakelock	36	1	224	severe
Moosonee District				
Kesagami Lake	35	1	77	severe
Kirkland Lake District				
Cane	13	3	1	light
Kerns	10	3	2	light
Pense	10	3	0	nil
Casey	13	3	2	light
Harley	13	3	0	nil
Evanturel	13	3	8	light
Playfair	13	3	1	light
Bowman	13	3	0	nil
Taylor	15	3	0	nil

[a] 1 cm = 0.39 in.

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex

For the second consecutive year high population levels of this sawfly were common in several districts of the Region. Severely defoliated jack pine trees were observed in plantations in Timmins and Kirkland Lake districts, in Gill and Studholme townships in Hearst District and in Mallard, Busby, Floranna and Margaret townships in Chapleau District.

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

Heavy defoliation of white spruce (*Picea glauca* [Moench] Voss) and black spruce (*Picea mariana* [Mill.] B.S.P.) plantations, snow hedges, ornamentals and open-grown trees recurred in the northern and eastern parts of the Region and considerable mortality of both species resulted. In Kapuskasing and Cochrane districts severe defoliation of ornamentals occurred from Hearst in the west to Iroquois Falls in the east. Small white spruce less than 1 m in height were severely defoliated in a 2.5-ha (6-acre) plantation east of Driftwood in Cochrane District.

In the Timmins and Kirkland Lake districts appreciable mortality of trees in plantations and old fields was noted at several locations along highways 11 and 101 and in the Englehart, Charlton and New Liskeard areas. Damage in the Chapleau District was confined to ornamental trees at Biscotasing.

White Pine Weevil, *Pissodes strobi* (Peck)

No significant change in population levels of this perennial pest of plantations was observed. Leader damage was common in most districts and ranged from 1 to 12% (Table 4).

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

For the past 5 years defoliation by this sawfly has been generally light in the northern part of the Region. In 1976 populations increased sharply, and moderate-to-severe defoliation was common in Hearst, Kapuskasing and Cochrane districts. The heaviest defoliation occurred in stands along Highway 11 from Hearst to the Geraldton District border. In the Ministry of Natural Resources tree nursery near Moonbeam in the Kapuskasing District, European larch (*Larix decidua* Mill.) windbreaks were approximately 70% defoliated. Small groups of trees suffered light-to-moderate damage in Peters and Bernier townships in Chapleau District. Elsewhere population levels were generally low and little defoliation was observed.

Table 4. Summary of tree damage caused by the white pine weevil in seven districts in 1976. (Counts were based on the examination of 100 trees at each location.)

Location (Twp)	Host	Avg height (m)[a]	Trees weeviled (%) 1975	1976
Cochrane District				
Potter	wS	2.1	4	4
Calder	bS	2.1	2	4
Kapuskasing District				
Fauquier	wS	1.5	14	12
Casselman	bS	1.8	6	8
Cummings	wS	1.5	9	10
Guerney	bS	1.8	6	6
Fergus	wS	2.1	11	7
Hearst District				
Way	bS	1.2	-	8
Mead	bS	1.2	-	3
Timmins District				
Thorneloe	jP	2.1	4	3
Jamieson	jP	1.8	2	1
Timmins	jP	1.5	3	4
Kirkland Lake District				
Beauchamp	jP	2.4	4	5
Cane	jP	1.8	4	3
Dunmore	jP	1.5	5	7
Bowman	jP	1.8	1	2
McEvay	jP	2.1	4	7
Evanturel	wP	1.8	-	12
Gogama District				
Benneweis	jP	2.1	3	8
Noble	jP	2.7	6	1
Roblin	jP	2.4	3	0
Chapleau District				
Deans	jP	2.4	1	1
Dupuis	jP	2.4	4	6
Dalmas	jP	2.7	5	2
Fawn	jP	1.5	4	3
Lloyd	jP	1.5	4	0
Floranna	jP	2.7	-	1
Arbutus	jP	1.5	-	2

[a] 1 m = 3.28 ft

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

Severe damage to mountain ash (*Sorbus* spp.) trees occurred in all districts. In the Hearst, Cochrane and Kapuskasing districts the most conspicuous damage was noted along highways and on ornamentals in the towns of Hearst, Kapuskasing, Cochrane and Iroquois Falls. In Chapleau and Gogama districts defoliation of 25 to 75% was common and similar defoliation was general in the Timmins and Kirkland Lake districts.

Aspen Leafroller, *Pseudexentera oregonana* Wlshm.

Severe defoliation by a complex of leafrollers occurred in aspen stands over an area of approximately 1,700 km^2 (670 sq. mi.) in the Kapuskasing, Cochrane, Timmins and Kirkland Lake districts (see Appendix, Fig. A2). The principal defoliator was the leafroller *Pseudexentera oregonana*, comprising approximately 90% of the population (see Frontispiece). Associated species included *Choristoneura conflictana* Wlk., *Compsolechia niveopulvella* Cham., *Sciaphila duplex* Wlshm. and others.

In the Gogama District moderate damage occurred in Sothman, Burrows, Kemp and Cabot townships. Light damage was observed in Garvey, Garibaldi and Asquith townships and in Mattagami Township northeast of Gogama. In the Chapleau District leafrollers were widespread but defoliation was generally light.

Table 5. Other forest insects

Insect	Host(s)	Remarks
Acrobasis betulella Hlst.	wB	Increased damage was general throughout the southern part of the Region.
Adelges lariciatus (Patch)	bS	galls evident at the Albany River forks, Moosonee District
Agromyza aristata Mall.	wE	moderate mining in Casey Twp, Kirkland Lake District
Aphrophora parallela (Say)	jP	pockets of heavy infestation in James and Marter twp, Kirkland Lake District

(continued)

Table 5. Other forest insects (continued)

Insect	Host(s)	Remarks
Archips argyrospilus (Wlk.)	deciduous	light defoliation at one point along Hwy 560, Gogama District
Archips cerasivoranus (Fitch)	cCh	low numbers in Guilfoyle Twp, Kapuskasing District and in Daoust Twp, Chapleau District
Celastrina lucia Kby.	dogwood	severe defoliation around Swastika and Kirkland Lake
Choristoneura conflictana Wlk.	tA	very low numbers throughout the Region
Choristoneura pinus pinus Free.	jP	found in low numbers at one point, McKeown Twp, Timmins District
Choristoneura rosaceana Harr.	wB	widespread through the southern part of the Region with light damage in Bannockburn Twp, Kirkland Lake District and in Hassard Twp, Timmins District
Chrysomela spp.	deciduous	light damage at a few locations, Chapleau District
Compsolechia niveopulvella Cham.	tA	moderate damage in Kirkland Lake and Timmins districts, particularly around Timmins and South Porcupine
Corythucha spp.	W	In the Chapleau District some species of willow (*Salix* spp.) suffered severe damage from these lace bugs.
Dichelonyx sp.	tA, wB	extremely high numbers of adult beetles on regeneration in Catherine, Cairo and Doon twp, Kirkland Lake District and in Hassard Twp, Timmins District

(continued)

Table 5. Other forest insects (continued)

Insect	Host(s)	Remarks
Dioryctria abietivorella Grt.	wS, bS	this cone insect found commonly in several townships, Kapuskasing District
Dioryctria reniculelloides Mut. & Mun.	wS	increased numbers found with spruce budworm at many points, Chapleau District
Enargia decolor Wlk.	tA	numerous in Skead and Carr twp, Kirkland Lake District
Epinotia nisella Clerck.	tA	low populations mixed with *Pseudexentera oregonana* Wlshm. along the Gurney Road, Kapuskasing District
Epinotia nisella criddleana Kft.	tA	common in Gauthier Twp near Larder Lake and light through the rest of Kirkland Lake District and in Timmins District
Erannis tiliaria Harr.	deciduous	common on a wide variety of hosts in the southwest corner of the Chapleau District
Eupareophora parca (Cress.)	bA	light defoliation at several locations, Kirkland Lake, Chapleau and Gogama districts
Malacosoma californicum pluviale Dyar	deciduous	wide distribution through the four most southerly districts along roads and cut-over areas
Messa populifoliella Town.	bPo	numerous at one point in German Twp, Timmins District
Micurapteryx sp.	W	severe defoliation extending from Hearst to the Geraldton District border

(continued)

Table 5. Other forest insects (continued)

Insect	Host(s)	Remarks
Monochamus sp.	jP	appreciable damage to mature trees by adults, Neelands Twp, Chapleau District
Neodiprion nanulus nanulus Schedl	rP, jP	light damage at many points in Kirkland Lake, Chapleau and Gogama districts
Neodiprion nigroscutum (Midd.)	jP	low numbers of this relatively rare sawfly collected in Busby Twp, Chapleau District
Neodiprion pratti banksianae Roh.	jP	substantial increases in population levels from 1975, particularly in Chapleau and Kirkland Lake districts
Operophtera bruceata (Hlst.)	tA	This potentially serious pest was found at several locations, Chapleau District
Orthosia hibisci Gn.	deciduous	relatively high numbers in Henwood, Bryce and Evanturel twp, Kirkland Lake District and around South Porcupine, Timmins District
Petrova albicapitana (Busck.)	jP	light damage throughout the Region
Pleroneura brunneicornis Roh.	bF	small, heavy infestation in Taylor Twp, Kirkland Lake District
Profenusa thomsoni (Konow)	wB	moderate mining in Macklem Twp, Timmins District and Eby Twp, Kirkland Lake District; varying numbers found in the rest of the Region
Tetralopha aplastella Hlst.	tA	moderate damage in Timmins, Timmins District and in Cane Twp, Kirkland Lake District

(continued)

Table 5. Other forest insects (concluded)

Insect	Host(s)	Remarks
Toumeyella numismaticum (P. & M.)	jP	small groups and single trees heavily infested at several points, Timmins and Kirkland Lake districts
Xylomges dolosa Grt.	tA	light, widespread occurrence but more numerous at points in Argyle Twp, Kirkland Lake District, Hassard Twp, Timmins District and Hazen Twp, Gogama District
Zellaria haimbachi Busck.	jP	low-to-moderate numbers in all jack pine stands, Timmins and Kirkland Lake districts
Zeugophora sp.	Po	unusually common at many points, Timmins and Kirkland Lake districts

TREE DISEASES

Grey Mold, *Botrytis cinerea* (Fr.) Pers.

This highly infectious disease caused serious damage to jack pine tubelings at the Gogama (OMNR) nursery in 1976. The mold is characterized by a thin grey web of mycelium on the infected plant parts. The perfect stage is *Sclerotinia fuckeliana* (deBy) Fckl. The condition became established in a greenhouse where excessive moisture perpetuated the disease. A large culling operation and the use of fungicides helped reduce losses. Approximately 51,000 trees (8.5% of the total tubeling stock) were lost to this disease.

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

No appreciable extension in the range of Dutch elm disease was detected. Several infected trees were observed on the outskirts of Englehart about 1.6 km (1 mi.) north of where the disease was found in 1973. Increasing mortality of mature elm (*Ulmus* spp.) was evident along the Blanche and Wabi rivers northwest of Lake Temiskaming.

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

Special emphasis was placed on surveys for rusts and other foliage diseases in 1976. Generally, the rusts associated with spruces were found at much lower levels than in 1975. Fruiting was confined to the lower crowns of trees or to small trees in all districts, and damage was negligible (Table 6).

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

Little change in the prevalence and infection level of ink spot of aspen was evident. Incidence was generally low and foliage damage light except at the locations listed in Table 7. Numerous stands were examined in the Hearst, Kapuskasing, Moosonee, Cochrane and Timmins districts but the disease was not observed.

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

Two areas of light infection occurred in Whigham and Murdock townships, Chapleau District (Table 8). All other stands examined showed little or no fruiting of the organism.

Table 6. Summary of spruce needle rust appraisals in six districts in 1976.

Location (Twp)	Area affected (ha)[a]	Defoliation level (%)	Trees affected (%)
Kapuskasing District			
Shearer	40	7	15
Cochrane District			
Stimson	20	3	3
Marathon	20	7	15
Hearst District			
Kohler	40	3	10
Moosonee District			
Kesagami Lake	4	3	4
Chapleau District			
Reaney	20	2	77
Foleyet	12	3	80
Peters	10	1	50
Busby	6	3	90
Ivanhoe	10	2	75
Gogama District			
Roblin	10	5	90
Dublin	5	1	90
Asquith	4	1	50

[a] 1 ha = 2.47 acres

Table 7. Summary of ink spot of aspen observations in three districts in 1976.

Location (Twp)	Area affected (ha)[a]	Defoliation level	Trees affected (%)
Chapleau District			
Halsey	10	6	79
Osway	5	9	83
Margaret	8	4	60
Deans	12	12	90
Foleyet	6	8	80

(continued)

Table 7 (concluded)

Location (Twp)	Area affected (ha)[a]	Defoliation level	Trees affected (%)
Gogama District			
Noble	12	12	85
McMurchy	10	25	100
Churchill	1	50	100
Garvey	12	20	100
Kirkland Lake District			
Casey	6	10	30
Armstrong	6	10	50
Savard	8	10	40
Blain	4	10	50
Dunmore	4	5	60
Gauthier	4	20	55

[a] 1 ha = 2.47 acres

Table 8. Observations of jack pine needle rust in four districts in the Region in 1976.

Location (Twp)	Area affected (ha)[a]	Tree ht[b]	Defoliation level	Trees affected (%)
Chapleau District				
Kalen	8	1.8	3	73
Fawn	10	1.5	1	15
Whigham	5	1.5	9	83
Murdock	8	2.1	6	88
Gogama District				
Vrooman	6	2.1	3	68
Hearst District				
Gill	6	2.1	2	90
Cochrane District				
Avon	2	2.1	2	90

[a] 1 ha = 2.47 acres

[b] 1 m = 3.28 ft

Leaf and Twig Blight, *Venturia macularis* (Fr.) Müller & Arx

This disease affected the upper branch tips of aspen through the northern and western parts of the Region. In the Chapleau and Gogama districts damage was light but heavier levels of damage occurred in the Hearst, Kapuskasing and Cochrane districts (Table 9).

Table 9. Summary of leaf and twig blight evaluations in trembling aspen stands in five districts in 1976.

Location (Twp)	Area affected (ha)[a]	Tree ht[b]	Defoliation (%)	Trees affected (%)
Kapuskasing District				
Parnell	20	1.2	8	70
Fergus	20	1.2	40	75
Opasatika	10	1.2	40	75
Fauquier	2	1.2	45	80
Shackleton	4	1.2	45	100
Hearst District				
Kohler	2	0.9	45	80
McCoig	2	1.2	40	80
Cochrane District				
Marathon	4	0.9	45	80
Chapleau District				
Deans	6	2.1	3	8
Evans	5	1.8	2	10
Caouette	6	3.9	4	32
Marshall	5	1.8	6	44
Floranna	2	1.2	10	48
Gogama District				
Noble	12	1.8	5	17
Dublin	2	1.2	1	4

[a] 1 ha = 2.47 acres
[b] 1 m = 3.28 ft

Winter Drying

There was scattered occurrence of this condition in 1976. All coniferous species were affected to some degree but young white (*Pinus strobus* L.) trees were particularly susceptible. Results of evaluations are shown in Table 10.

Table 10. Summary of winter drying evaluations in three districts.

Location (Twp)	Host	Area affected (ha)[a]	Defoliation level (%)	Trees affected (%)
Chapleau District				
Ivanhoe	rP	3.0	14	79
Deans	wP	2.0	29	100
Gogama District				
Kemp	wP	2.5	15	90
Kirkland Lake District				
Beauchamp	wP	4.0	18	22
Casey	ScP	0.5	10	14

[a] 1 ha = 2.47 acres

Abiotic Damage to White Pine

Foliar damage on mature and semimature white pine trees was detected in Borden and Kalen townships, Chapleau District. White pine is highly sensitive to a wide variety of physiogenic diseases and because many of them exhibit similar symptoms, differentiating between them is often difficult. In samples from the two areas the causal agent was identified as either pollution damage or the condition known as semimature tissue needle blight. The main symptom was a discoloration of the needles to orange-red, evenly distributed through the crowns of affected trees. The evenness of this distribution was consistent but trees in the same area showed much variation in discoloration intensity.

Table 11. Other important diseases

Organism	Host(s)	Remarks
Chrysomyxa arctostaphyli Diet.	bS	7% of trees affected in one stand in Cosens Twp, Chapleau District
Cronartium coleosporoides Arth. complex	jP	9% of the pines cankered in stands around the OMNR nursery, Swastika, Kirkland Lake District
Davisomycella ampla (Davis) Darker	jP	trace defoliation levels in most stands examined in the rust-sampling program
Melampsorella caryophyllaccarum Schroet.	bF	single trees affected at several points in Chapleau District
Pucciniastrum epilobii Otth	bF fireweed	trace in Parnell Twp, Kapuskasing District and heavy on fireweed in Findlay Twp, Cochrane District

The following diseases were evaluated in recent years and no important change was observed in 1976:

Arceuthobium pusillum Peck - Eastern Dwarf Mistletoe
Armillaria mellea (Vahl ex Fr.) Kummer - Shoestring Root Rot
Cronartium commandrae Pk. - Commandra Rust
Cronartium comptoniae Arth. - Sweetfern Blister Rust
Cronartium ribicola J.C. Fischer - White Pine Blister Rust
Endocronartium harknessii (J.P. Moore) - Western Gall Rust of Hard Pines
Gremmeniella abietina (Lagerb.) Morelet - Scleroderris Canker of Pine
Hypoxylon mammatum (Wahl.) Miller - Hypoxylon Canker of Poplar

APPENDIX

NORTHERN REGION

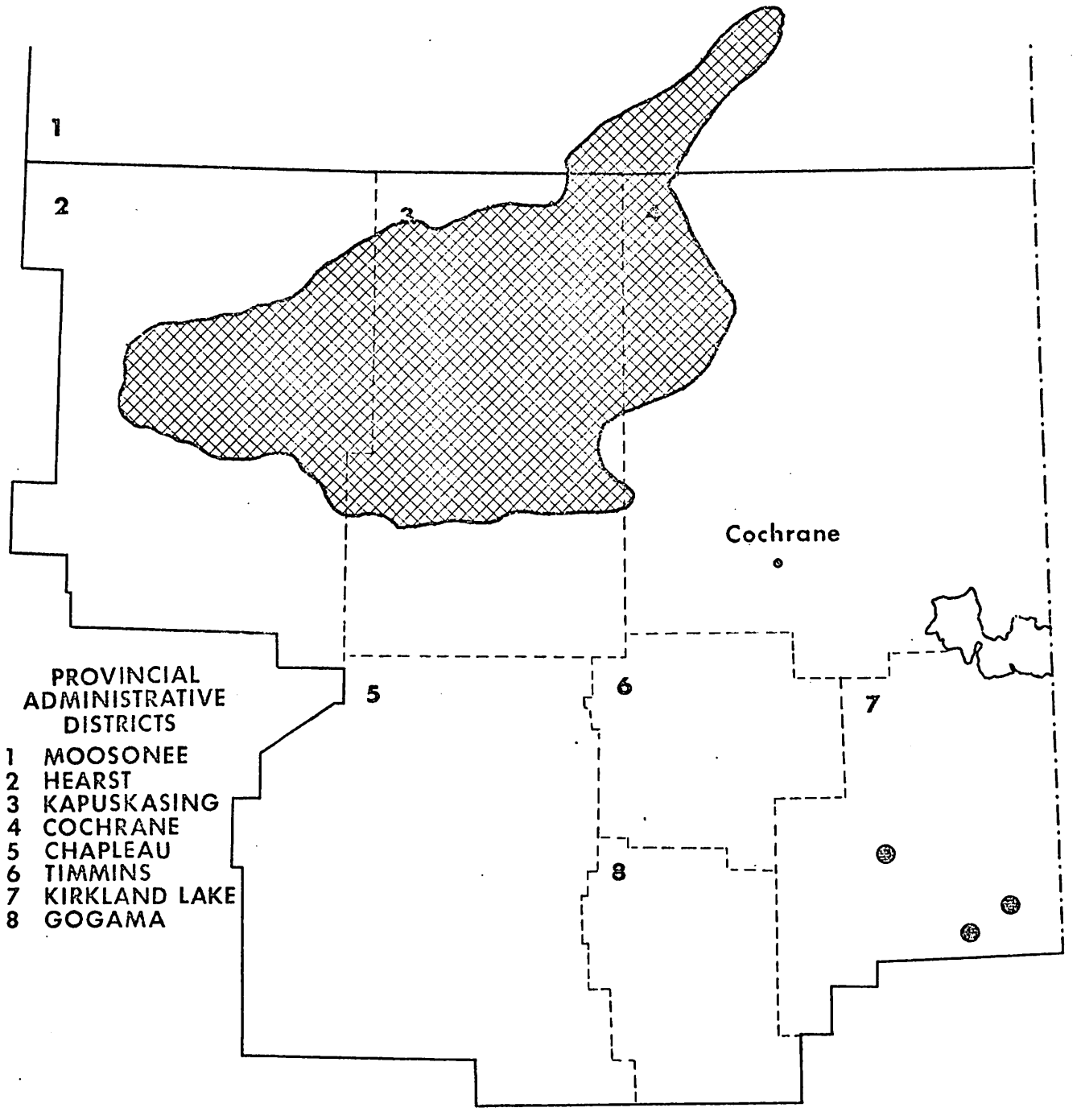

Fig. A1. FOREST TENT CATERPILLAR

Areas within which moderate-to-severe defoliation of trembling aspen occurred in 1976

or

NORTHERN REGION

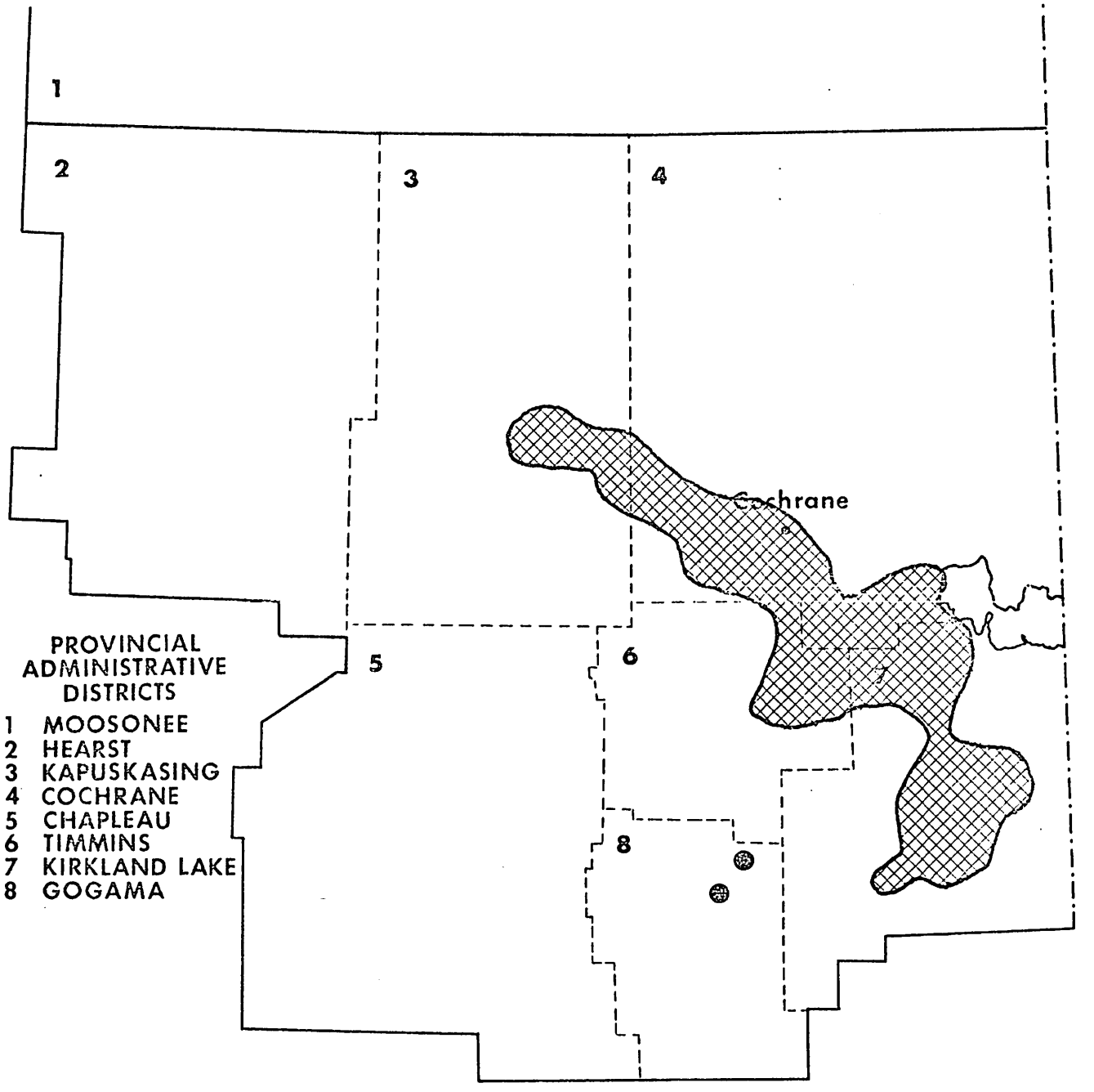

Fig. A2. ASPEN LEAFROLLER

Areas within which moderate-to-severe defoliation of trembling aspen occurred in 1976

or