

FOREST INSECT AND DISEASE SURVEYS  
IN THE CENTRAL REGION OF ONTARIO, 1977

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Frontispiece



Severe defoliation caused by the oak leaf shredder, *Croesia semipurpurana* (Kft.).

Pin oak killed recently by oak twig galls, *Callirhytis cornigera* (O. & S.).



## SURVEY HIGHLIGHTS

This report describes the more important forest insect and disease conditions in the Central Region in 1977. Major increases were evident in populations of the forest tent caterpillar, larch sawfly, web-spinning sawfly and eastern tent caterpillar. Populations of the oak leaf shredder, larch casebearer, and spruce budworm remained at approximately the same levels as in 1976, while the basswood looper and fall cankerworm declined in numbers. Control operations were carried out against the oak leaf shredder, larch sawfly, yellowheaded spruce sawfly, and introduced pine sawfly.

Forest disease surveys concentrated on problems connected with oak mortality and maple decline. Generally, maple in woodlots were found to be healthy while ornamental trees in urban areas and along roadsides showed signs of deterioration. Three permanent sample plots were established to study oak mortality. Horse chestnut leaf blotch, ash dieback, winter drying, and frost damage were also of concern to private individuals and forest managers.

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APPENDIX

## INSECTS

Cedar Leafminers, *Argyresthia aureoargentella* Brower, *A. canadensis* Free., *A. thuiella* Pack., and *Pulicalvaria thujaella* (Kft.)

Populations remained generally low following the major declines which occurred in 1976. Small pockets of medium infestation persisted in the Hockley Valley east of Orangeville along the Maple-Huron district boundary. A small area of medium-to-heavy infestation occurred in the Creemore-Dunedin area of Nottawasaga Township, Huronia District. In the Lindsay District in Harvey and Verulam townships populations declined to very low levels.

Oak Twig Galls, *Callirhytis cornigera* (O. & S.)

Heavy infestations of this gall-forming insect continued throughout the eastern part of the Niagara District. Considerable mortality has occurred on scattered oak (*Quercus* sp.) along the Chantler Road in the town of Pelham, at several locations along the Niagara River from Fort Erie to Niagara-on-the-Lake, and in the Fonthill area. Although pin oak (*Quercus palustris* Muenchh.) was the most severely damaged (see Frontispiece), bur oak (*Quercus macrocarpa* Michx.), red oak (*Quercus rubra* L.) and white oak (*Quercus alba* L.) were also affected.

Web-spinning Sawfly, *Cephalcia* sp. probably *frontalis* Westw.

Populations of this usually unimportant insect increased markedly for the second consecutive year. In the Lindsay District, heavy infestations persisted on planted red pine (*Pinus resinosa* Ait.) in Harvey and Douro townships, while medium-to-heavy infestations were found on planted white pine (*Pinus strobus* L.) in Balsam Lake Provincial Park, Bexley Township (Table 1). In the Huronia District, populations increased to high levels in a number of Scots pine (*Pinus sylvestris* L.) Christmas tree plantations in Oro Township. New, heavy infestations were recorded on jack pine (*Pinus banksiana* Lamb.) in Adjala Township, on Scots pine in Tosorontio Township and on red pine in Vespra Township. A medium infestation was observed on planted red pine, south of Mono Mills in the Cambridge District.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of population surveys, damage appraisals, egg sampling, and infestation forecasts for 1978, on an Ontario-wide basis, are included in a special report by Howse et al. (Report O-X-280). This report provides a complete summary of the status of the spruce budworm in Ontario in 1977 and gives infestation forecasts for the province for 1978.

Table 1. Summary of the incidence and degree of infestation by the web-spinning sawfly on white pine at three locations in the Lindsay District (counts based on examination of 100 trees at each location).

Location (Twp)	Avg ht of trees (m) <sup>a</sup>	No. of trees infested	Degree of infestation
Bexley	2	87	heavy
Douro	2.5	83	heavy
Harvey	2	100	heavy

<sup>a</sup> 1 m = 3.28 ft

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Increased populations of this important pest were evident throughout the Central Region in 1977. In the Huronia District light infestations were detected on Scots pine Christmas tree plantations in Oro, Mulmur and Tosorontio townships, and on planted jack pine in Adjala Township. Light infestations were also observed in Whitchurch Township, Maple District and in Puslinch and Ancaster townships, Cambridge District. Occasional infested shoots were noted at numerous other locations.

Larch Casebearer, *Coleophora laricella* Hbn.

Heavy infestations caused severe browning of European larch (*Larix decidua* Mill.) foliage in West Gwillimbury Township, Huronia District, and in Whitchurch and Pickering townships, Maple District. Medium infestations were observed on European larch in Oro Township, Huronia District, on native tamarack (*Larix laricina* [Du Roi] K. Koch) near Luther Lake, Cambridge District and in the Orono Forest Station, Lindsay District. Aerial surveys revealed similar defoliation in approximately 520 hectares (2 mi.<sup>2</sup>) of native tamarack in the Minesing swamp area of Vespra and Sunnidale townships, Huronia District; however, the nature of the terrain precluded confirmation of this defoliation by ground surveys.

Oak Leaf Shredder, *Croesia semipurpurana* (Kft.)

In the Huronia District, heavy infestations persisted in the Methodist Point-Penetanguishene area for the third consecutive year. This includes the site of Awenda Provincial Park which was treated with Sevin-4-oil and Orthene in an effort to avoid serious damage to valuable red oak stands. Subsequent aerial surveys revealed little defoliation within the sprayed area compared to moderate or severe defoliation in adjacent unsprayed stands, and this indicates that good foliage protection was



achieved by the treatments. Aerial surveys also revealed heavy infestations on Beausoleil Island in the Georgian Bay Islands National Park and on Christian, Beckwith, and Giants Tomb islands in Georgian Bay. Particularly severe damage was observed on mature red oak on the east side of Giants Tomb Island (see Frontispiece). Increased populations in the medium-to-heavy range occurred in the Dufferin County Forest. New areas of heavy infestation were detected in the Barrie-Minesing area and small pockets of heavy defoliation were observed northeast of Barrie in Oro Township. New, heavy infestations were also detected on red oak in the town of Lincoln, and on white, bur and pin oak in the town of Pelham, Niagara District.

In the Maple District, moderate defoliation, with patches of heavy damage, occurred in the Uxbridge-Ballantrae area where considerable mortality is now evident.

Populations in Clarke and Manvers townships, Lindsay District declined to low levels.

#### Walnut Caterpillar, *Datana integerrima* G. & R.

High populations were observed in the Brantford-St. George area, south of Hamilton in Binbrook Township, and between Milton and Oakville in the Cambridge District. Heavy infestations also caused severe defoliation of black walnut (*Juglans nigra* L.) along Highway 3 between Dunnville and Port Colborne in the Niagara District. Medium infestations occurred near Paris in the Cambridge District and south of Barrie in the Huronia District. Small numbers of colonies were observed at numerous locations elsewhere in the Region.

#### Introduced Pine Sawfly, *Diprion similis* (Hartig)

Populations of this usually unimportant insect have increased steadily in the Lindsay District for the past several years. In 1977, medium infestations occurred on planted white pine in Balsam Lake Provincial Park in Bexley Township. Medium infestations in a white pine seed orchard at the Orono Forest Station were controlled by aerial spraying with Malathion. Small numbers of larvae were collected on beating samples at a number of other locations in the Region.

#### Birch Leafminer, *Fenusa pusilla* (Lep.)

High populations were again evident on ornamental trees in many urban areas. Heavy infestations also occurred on woodlot and open-grown white birch (*Betula papyrifera* Marsh.) in Nottawasaga, Oro, Orillia, Tay, Essa and Mulmur townships, Huronia District and in Uxbridge Township, Maple District. Light infestations were observed in the Durham and Ganaraska forests, Lindsay District. Mined leaves were observed commonly in the remainder of the Region.

Fall Webworm, *Hyphantria cunea* Dru.

The most severe damage occurred in a mixed stand of red maple (*Acer rubrum* L.) and black ash (*Fraxinus nigra* Marsh.) south of Alliston in Huronia District, where 15 m (50 ft) trees were completely encased in silk. High numbers of feeding nests were also observed on a variety of deciduous hosts in the Paris-Brantford area of Cambridge District, in several townships in the eastern portion of Lindsay District and in the Fort Erie-Niagara-on-the-Lake area of Niagara District. Populations were somewhat reduced in the Orillia-Port Severn-Honey Harbour area of the Huronia District where they have been quite high for the past several years. Small numbers of nests were observed commonly throughout the Region.

Eastern Tent Caterpillar, *Malacosoma americanum* F.

Exceptionally heavy infestations occurred in the northern Huronia and Lindsay districts. The most severe damage was observed in abandoned fields and orchards in the Collingwood area, along numerous concession roads in Tiny, Tay, and Flos townships, Huronia District, and in the Peterborough-Omemee area of Lindsay District. Large numbers of tents were also observed in the Niagara Falls-Fonthill area of Niagara District. Smaller numbers of tents were found at numerous locations in the Maple District and somewhat less commonly in the Cambridge District.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Infestations of this major defoliator increased in both area and intensity in 1977. In the Lindsay District, heavy infestations spread south from the Algonquin Region into Belmont, Dummer, Harvey, Eldon and Bexley townships. Small, isolated pockets of heavy infestation were also observed in Mariposa, Manvers, Ops and Ennismore townships (see Appendix, Fig. A1).

In the Huronia District, heavy infestations spread south and east to encompass most of Orillia, Rama and Mara townships and extended south into Thorah Township of the Maple District. Aerial surveys revealed new, heavy infestations in Baxter Township, on many small islands in Georgian Bay including parts of the Georgian Bay Islands National Park, and on Christian and Beckwith islands. Heavy infestations were also discovered in about 100 ha (250 acres) of sugar maple (*Acer saccharum* Marsh.) woodlots in the St. Agatha-Baden area southwest of Kitchener-Waterloo in the Cambridge District. Numerous woodlots and trees on the periphery of these main bodies of medium-to-heavy infestations showed signs of light defoliation while single colonies and wandering larvae were observed commonly throughout the Region.

Egg-band counts from four districts and infestation forecasts for 1978 are summarized in Table 2(a). Additional egg-band counts were made in Six Mile Lake Provincial Park after initial sampling indicated a heavy infestation potential for 1978. These additional counts are listed in Table 2(b) and confirmed the presence of high egg-band populations. Sampling systems designed to rate infestation levels and provide forecasts have not been researched for sugar maple or red oak for either whole trees or branch samples. Consequently forecasts listed in the following tables are based on experience and may not be accurate.

Table 2(a). Summary of forest tent caterpillar egg-band counts in four districts in 1977 and infestation forecasts for 1978 (based on the average number of egg bands on five branches, one from each of five trees, or on the average number on the entire crown of three felled trees in each area).

Location (Twp)	Host	Avg ht of trees (m) <sup>a</sup>	Avg no. of egg bands		Infestation forecasts for 1978 <sup>b</sup>
			per tree	per 1.25 m branch	
Lindsay District					
Bexley	tA	9	1		L
Huron District					
Tiny	sM	15	0		nil
Flos	sM	12	3.3		L
Rama	tA	8	4.6		M
Nottawasaga	sM	12		0	U
Tiny	rO	15	1.3		L
Baxter (Six Mile Lake Prov. Park)	rO	15		1	S
Maple District					
Thorah	tA	11	9.3		S
Cambridge District					
Wilmot	sM	31		1.2	S

<sup>a</sup> 1 m = 3.28 ft

<sup>b</sup> L - light, M - moderate, S - severe, U - uncertain

Table 2(b) Forest tent caterpillar egg-band counts at 4 locations in Six Mile Lake Provincial Park, Baxter Township, Huronia District in 1977 and infestation forecasts for 1978.

Location	Host	No. of trees	Avg ht of trees (m) <sup>a</sup>	Total no. of egg bands	Infestation forecasts for 1978 <sup>b</sup>
A	tA	3	15	18	M
B	rO	1	11	24	S
C	rO	2	12	40	S
D	tA	2	15	50	S

<sup>a</sup> 1 m = 3.28 ft

<sup>b</sup> M - moderate, S.- severe

#### Balsam Fir Sawfly, *Neodiprion abietis* complex

Small pockets of heavy infestation on balsam fir (*Abies balsamea* [L.] Mill.) occurred in Flos, Vespra and Oro townships, Huronia District and in the Grand Valley Forest in Erin Township, Cambridge District. Light-to-medium infestations were observed at a number of other locations in Huronia, Cambridge and Lindsay districts.

#### Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

High populations were recorded on planted red pine in Mariposa, Bexley and Eldon townships, Lindsay District. Localized pockets of medium infestation were observed in Rama and Matchedash townships, and light infestations occurred in young pine plantations along Highway 400 in Medonte and Vespra townships, Huronia District. Occasional single colonies were encountered in the southern Huronia and Maple districts. The insect was not observed in red pine plantations in Harvey and Douro townships, Lindsay District which were treated with virus by the Forest Pest Management Institute in 1976.

#### European Pine Sawfly, *Neodiprion sertifer* (Geoff.)

Populations remained generally low in 1977 (Table 3). Small, medium infestations were observed at three locations in Tosorontio and Mulmur townships, Huronia District and in Uxbridge Township, Maple District. Only

light damage was observed elsewhere although larval feeding on ornamental trees again prompted numerous inquiries from concerned owners.

Table 3. Summary of European pine sawfly colony counts in three districts in 1977 (100 trees examined at each location).

Location (Twp)	Host	Avg ht of trees (m) <sup>a</sup>	Trees infested (%)	Total no. of colonies
Lindsay District				
Manvers	scP	1.5	10	10
Cartwright	scP	1.5	18	19
Clarke	rP	1.0	8	9
Clarke	scP	1.5	4	4
Maple District				
Uxbridge	scP	2.5	65	182
Huronian District				
Tosorontio	scP	2.5	55	115

<sup>a</sup> 1 m = 3.28 ft

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

Severe defoliation was again recorded on planted white spruce (*Picea glauca* [Moench] Voss) in Mara and Baxter townships, Huronia District. Ornamental white spruce in Balsam Lake Provincial Park, Lindsay District, which were successfully treated with Malathion in 1975, were again heavily infested. Aerial application of Malathion was carried out in June 1977, and gave excellent control, with the percentage of infested trees being reduced from 62 to 0. Smaller numbers of larvae caused varying amounts of defoliation on ornamentals and open-grown trees at numerous other locations.

#### White Pine Weevil, *Pissodes strobi* (Peck)

Populations remained at a generally low level with only minor fluctuations being observed. The heaviest infestation recorded was in Medonte Township where 57% of the leaders were infested (Table 4).

Low-to-medium numbers of infested leaders were observed in Whitchurch Township, Maple District and in Bexley Township, Lindsay District. Small numbers of infested leaders were common throughout the Region except in Niagara Falls District where damage was rare.

Table 4. Summary of leader damage to white pine by the white pine weevil in two districts in 1977 (counts based on examination of 100 trees systematically selected at each location).

Location (Twp)	Avg ht of trees (m) <sup>a</sup>	No. of trees infested	Degree of infestation
Lindsay District			
Clarke	3	6	light
Manvers	2	3	light
Bexley	2	9	light
Huron District			
Medonte	4	57	heavy

<sup>a</sup> 1 m = 3.28 ft

#### Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Widespread, heavy infestations were evident for the second consecutive year (see Appendix, Fig. A2). In the Huron District, severe defoliation was observed on 18 m (60 ft) tamarack in Rama Township and on planted European larch in Mulmur, Vespra, Mono and West Gwillimbury townships. Heavy infestations recurred on tamarack in the Luther Marsh in East and West Luther townships, and on European larch in Beverly, North Dumfries, and Woolwich townships in the Cambridge District. High populations were also recorded in Clarke Township, Lindsay District. In the Maple District, heavy infestations were again recorded in Albion, Uxbridge and Whitchurch-Stouffville townships. Aerial spraying with Malathion was carried out to control heavy infestations in plantations of European larch, Japanese larch (*Larix leptolepis* [Sieb. & Zucc.] Gord.) and tamarack in the Main Tract, Durham Regional Forest, and on adjacent private lands in Uxbridge Township. Observations of tagged colonies made before and after spraying indicated that good control was achieved (Table 5).

Table 5. Summary of pre-spray and post-spray observations of larch sawfly colonies in Uxbridge Township in 1977.

Location	Host	Date treated	No. of living colonies	
			1 day prior to spray	1 day following spray
<u>1st application</u>				
Lot 13 Con. 5	jL	July 4	64	8
Lot 12 Con. 6	eL	July 4	82	20
Lot 4 Con. 6	eL	July 4	47	3
Lot 3 Con. 6	eL	July 4	21	9
<u>2nd application</u>				
Lot 13 Con. 5	jL	July 14	8	0
Lot 12 Con. 6	eL	July 14	20	0
Lot 4 Con. 6	eL	July 14	3	0
Lot 3 Con. 6	eL	July 14	9	0

Oak Leafmining Sawfly, *Profenusa lucifex* Ross

Heavy infestations caused severe browning of red and white oak foliage in 5 000 ha (12,300 acres) south of Rice Lake in Hamilton and Haldimand townships, Lindsay District. Small pockets of heavy infestation occurred in Asphodel, Harvey, and Manvers townships, Lindsay District (Table 6), and in Brant Township, Cambridge District. Light infestations were also found in Onondaga Township, Cambridge District, and in Vespra Township, Huronia District.

Table 6. Summary of leaves mined by the oak leafmining sawfly at four locations in the Lindsay District in 1977 (counts based on examination of 100 leaves, randomly selected from five trees at each location).

Location (Twp)	Host	Percentage of leaves mined
Asphodel	wO	93
Hamilton	wO	98
Harvey	wO	78
Manvers	wO	89

Table 7. Other forest insects

Insect	Host(s)	Remarks
<i>Acronicta americana</i> Harr. American dagger moth	siM	low numbers on ornamentals near Paris, Cambridge District
<i>Agrilus</i> sp. A borer	hybrid poplar	causing mortality in one plantation near Stayner, Huronia District
<i>Alsophila pometaria</i> (Harr.) Fall cankerworm	various deciduous hosts	reduced populations at several locations in Huronia and Maple districts; heavy infestations at St. John's Conservation Area, Niagara District
<i>Anisota finlaysoni</i> Riotte Orangestriped oakworm	w0, b0, r0	high populations near Milton and Oakville, Cambridge District; small numbers of colonies in Kitchener-Waterloo-Elmira area of Cambridge District
<i>Aphrophora parallela</i> (Say) Pine spittlebug	scP	causing branch and tip mortality in Darlington Twp, Lindsay District; heavy infestations in Clarke, Cartwright and Manvers twp, Lindsay District and Oro Twp, Huronia District
<i>Archips cerasivoranus</i> (Fitch) Uglynest caterpillar	various deciduous hosts	high populations at a number of widely separated locations in the Region
<i>Caliroa</i> sp. Slug sawfly	r0	heavy infestation in Uxbridge Twp, Maple District
<i>Cecidomyia citrina</i> (O.S.) Linden twig gall	Ba	medium infestation near Brantford, Cambridge District
<i>Contarini carpini</i> Kieffer A midge	b1B	heavy infestation at Angus, Huronia District

(continued)



Table 7. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Corthylus punctatissimus</i> Zimm. Hardwood ambrosia beetle	sM	causing medium-to-heavy mortality of reproduction at a number of locations in northern Huronia District
<i>Dasineura gleditschiae</i> (O.S.) Locust podgall midge	Hon	heavy on ornamentals at numerous locations
<i>Dioryctria disclusa</i> Heinr. Rusty pine cone moth	jP, scP	heavy infestation at several locations in Huronia District
<i>Eucosma gloriola</i> Heinr. Eastern pineshoot borer	rP, wP, scP	medium to heavy at several locations in Huronia District
<i>Fenusa ulmi</i> Sund. Elm leafminer	wE, sE	heavy infestations in Lincoln Twp, Niagara District and Vespra Twp, Huronia District
<i>Grapholitha</i> sp. An appleworm	wP1	commonly found in Lincoln Twp, Niagara District
<i>Holocera chalcfrontella</i> Clem. A sumac moth	Su	high populations in Mono and Baxter twp, Huronia District
<i>Janus abbreviatus</i> (Say) Willow shoot sawfly	hybrid poplar, cPo	low populations at Orono Forest Station following control operations in 1976
<i>Janus bimaculatus</i> Nort. Viburnum shoot borer	highbush cranberry	medium infestation in Essa Twp, Huronia District
<i>Laspeyresia caryana</i> Fitch Hickory shuckworm	big shellbark hickory	heavy infestation in nuts, South Dumphries Twp, Cambridge District
<i>Lecanium</i> sp. Lecanium scale	English oak	high populations at Lakefield College campus, Lindsay District

(continued)

Table 7. Other forest insects (concluded)

Insect	Host(s)	Remarks
<i>Neodiprion pratti banksianae</i> Roh. Jack pine sawfly	jP	light infestation in Adjala Twp Huronian District
<i>Pissodes approximatus</i> Hopk. Northern pine weevil	colS	causing serious damage to commercial plantation in Vespra Twp, Huronia District
<i>Plagioderia versicolora</i> Laich. Imported willow leaf beetle	hybrid poplar, W	high populations on hybrid poplar at Orono Forest Station, Lindsay District and on willow at several locations in Maple and Cambridge districts
<i>Pristiphora geniculata</i> Htg. Mountain ash sawfly	Mo	heavy on ornamentals at numerous locations
<i>Proteoteras aesculana</i> Riley Maple twig borer	siM	56% of leaders infested at one location in the Orono Forest Station, Lindsay District
<i>Pseudexentera cressoniana</i> Clem. Oak leafroller	rO	associated with oak leaf shredder ( <i>Croesia semipurpurana</i> ) in Tiny Twp, Huronia District
<i>Rhyacionia buoliana</i> Schiff. European pine shoot moth	rP	populations somewhat reduced in Cambridge and Huronia districts
<i>Toumeyella liriodendri</i> (Gmelin) Tulip scale	tulip	heavy at St. John's Conservation area near Fonthill, Niagara District
<i>Yponomeuta multipunctella</i> Clem. Speckled micro moth	Euonymus	severe defoliation at one location in the town of Lindsay, Lindsay District

## TREE DISEASES

Diplodia Blight, *Diplodia pinea* (Desm.) Kickx

A single, heavy infection centre of this disease was observed in a 9 m (30 ft) Scots pine plantation in Medonte Township, Huronia District. Scattered mortality was evident on larger trees while very heavy mortality occurred on small understory reproduction. Light infections were observed on ornamental Austrian pine (*Pinus nigra* Arnold) in Paris, Hornby and Oakville, Cambridge District.

The disease is characterized by clusters of stunted shoots which turn brown and upon which abundant fruiting bodies occur. Copious resin flow glues the needles together, causing a clumped and stunted appearance of branch tips. Infection usually progresses from the lower branches upward, except in the case of understory trees which are infected from the top down owing to the constant rain of spores from above. Small trees in this situation usually die quickly while a number of years may pass before larger trees succumb.

Leaf Anthracnose of Maple, *Kabatella apocrypta* (El. & Ev.) Arx

Foliar damage by this leaf disease remained high in the Lindsay District, but declined slightly in the remainder of the Region. As usual, trees in urban and roadside situations were much more severely damaged than those growing in the interior of stands. At one location, in the city of Peterborough, Lindsay District, 73% of the sugar maple trees examined were infected and 100% of the foliage was damaged (Table 8). High levels of damage were also present in Eldon Township, Lindsay District, and in the town of Pelham, Niagara District. Light and medium infections were found commonly throughout the Region.

Horse Chestnut Leaf Blotch, *Phyllosticta paviae* Desm.

Although common in the Region, this disease declined in incidence from 1976. Heavy infections were recorded on ornamentals in Barrie and Orillia in the Huronia District, in the Brantford-Cambridge area of Cambridge District, and in the cities of Niagara Falls, Welland, St. Catharines and Port Colborne in the Niagara District. Light and medium infections were observed at a number of other widely separated locations.

Table 8. Summary of damage caused by leaf anthracnose of sugar maple at 11 locations in 1977 (150 trees examined at each location).

Location	Avg ht of trees (m) <sup>a</sup>	Trees affected (%)	Foliage damage (%)
Lindsay District			
City of Lindsay	15	8.0	56.0
City of Peterborough	19	73.3	100.0
Fenelon Twp	14	8.6	80.0
Emily Twp	18	12.6	69.5
Eldon Twp	21	60.0	79.0
Huron District			
City of Barrie	17	50.0	30.0
Mono Twp	15	56.0	9.9
Maple District			
Whitchurch Twp	13	25.0	10.0
Cambridge District			
City of Cambridge	13	70.0	25.0
Niagara District			
Town of Pelham	8	31.0	44.6
City of Port Colborne	8	10.0	3.3

<sup>a</sup> 1 m = 3.28 ft

Leaf Spot Disease, *Septoria populicola* Pk.

Heavy infections of this disease occurred on scattered pockets of balsam poplar (*Populus balsamifera* L.) in Manvers, Ops, Monaghan, and Fenelon townships, Lindsay District (Table 9). Light infections were observed at a few locations in the adjacent Maple District. The disease causes leaves to wither and fall prematurely; however, since most leaf drop occurs late in the growing season, little permanent damage is done to the host.

Table 9. Summary of damage on balsam poplar by a leaf spot disease at five locations in the Lindsay District in 1977.

Location (Twp)	Avg ht of trees (m) <sup>a</sup>	Trees affected (%)	Foliage damage (%)
Manvers	10	73.3	82.5
Monaghan	10	95.5	78.5
Manvers	10	60.0	82.0
Ops	12	70.0	80.0
Fenelon	10	65.0	75.0

<sup>a</sup> 1 m = 3.28 ft

#### Ash Dieback

This condition of white and green ash was found much more commonly than usual in the Cambridge-Brantford-Paris area and in the Kitchener-Waterloo area of Cambridge District. Dieback was also prevalent on hedge-row trees in Medonte Township and in the city of Barrie in Huronia District. Occasional affected trees were observed at several locations in the Maple District. A fungus, *Cytospora* sp. was commonly found fruiting on the dead branches.

#### Maple Decline

Part of the 1977 pathology field program was devoted to the study of decline of sugar maple as evidenced by crown deterioration or branch mortality. Trees were examined in urban, rural (roadside), and woodlot situations. The incidence of maple decline ranged from 1.8% in Vespra Township, Huronia District to 60.6% in the cities of Barrie and Orillia (Table 10). Results indicate that trees in urban situations and along recently disturbed roadsides were much more seriously affected than those growing in woodlots. Organisms isolated from affected trees included *Steganosporium ovatum* (Pers. ex Merat) Hughes, *Steganosporium pyriforme* (Pers. ex Merat) Hughes, *Cryptodiaporthe acerinum* Reid & Cain, *Eutypella parasitica*, Davids. & Lorenz, *Cytospora* sp. and *Cephalosporium* sp.

#### Oak Decline

In 1977, four plots were established to follow the progress of crown deterioration in red oak stands. Severe dieback and mortality are considerable in some stands, particularly those with a history of

insect defoliation, principally by the oak leaf shredder (*Croesia semipurpurana* [Kft.]). In each plot 100 non-suppressed trees were tagged, heights and diameters were measured, and each tree was rated for severity of dieback. The plots will be monitored for a period of five years to record the progress of decline and to determine the organisms associated. Results of this year's surveys are recorded in Table 11.

Table 10. Summary of maple deterioration at nine locations in 1977 (150 trees examined at each location).

Location	Aspect	Avg ht of trees (m) <sup>a</sup>	Trees affected (%)	Trees severe (%)
Lindsay District				
Fenelon Twp	roadside	14	7.3	5.3
Huronian District				
Vespra Twp	woodlot	12	1.8	0.0
Mono Twp	roadside	15	42.6	15.3
City of Orillia	urban	15	60.6	28.0
City of Barrie	urban	19	60.6	30.0
Cambridge District				
Nichol Twp	roadside	15	15.3	4.6
City of Cambridge	urban	13	50.0	30.0
City of Oakville	urban	15	34.6	20.0
Maple District				
Whitchurch Twp	roadside	13	44.0	22.0

<sup>a</sup> 1 m = 3.28 ft

#### Frost

Several frosts in late May, and a severe frost on June 9, caused scattered damage to a variety of tree species in the west part of the Huronia District. The most severe damage occurred on .5 m Norway spruce (*Picea abies* [L.] Karst.) outplantings in the OMNR seed orchard at Glencairn in Tosorontio Township where 92% of the trees were affected and 80% foliage damage was recorded. Light-to-medium damage occurred on planted white spruce in the Dufferin County Forest and on nearby white spruce Christmas tree plantations in Mulmur Township. Damaged foliage on Christmas trees was removed when annual pruning was carried out.

Table 11. Dieback and tree size data for the plots established to monitor oak decline<sup>c</sup> in three districts in 1977 (100 trees examined at each location).

Location (Twp)	Avg ht of sample trees (m) <sup>a</sup>	Avg DBH of sample trees (cm) <sup>b</sup>	Dieback class (%)			
			1	2	3	4
Lindsay District						
Clarke	21	23	38	11	32	19
Huronina District						
Tiny	21	28	64	15	20	1
Mulmur	21	25	54	7	27	12
Maple District						
Uxbridge	21	26	42	9	31	18

<sup>a</sup> 1 m = 3.28 ft

<sup>b</sup> 1 cm = 0.39 in.

<sup>c</sup> Oak decline is principally branch mortality. Class 1 is healthy; classes 2-4 have more than 20, 40, and 60%, respectively, of branches dead; class 5 is dead.

#### Salt Damage

This perennial problem was again evident at numerous locations along the more heavily travelled roads. Particularly severe damage occurred along Highway 401 east and west of Toronto, along Highway 35 south of Fenelon Falls, and on Highway 400 between Barrie and Toronto. Somewhat lighter damage was also observed along Highway 11 between Barrie and Orillia, and along Highway 401 in the Cambridge area.

#### Winter Drying

Damage by winter drying was less conspicuous in 1977 than in previous years; moderate-to-severe browning of foliage was evident in a number of pine plantations in the northern Huronia District. Localized pockets of severe damage occurred in Oro, Orillia, and Tiny townships, Huronia District, and in Hope Township, Lindsay District

where 90% defoliation was recorded (Table 12). Moderate damage was again present in red pine plantations in Erin and East Flamborough townships, Cambridge District, and light damage occurred at a number of locations in the Maple and Niagara districts.

Table 12. Percentage of trees affected and level of foliar damage caused by winter drying in three districts in 1977 (100 trees examined at each location).

Location (Twp)	Tree species	Avg ht of trees (m) <sup>a</sup>	Trees affected (%)	Level of foliar damage (%)
Huronian District				
Oro	scP	1.5	80	55
Orillia	wP	0.5	90	50
Cambridge District				
Erin	rP	0.5	40	30
Lindsay District				
Hope	scP	1.5	31	90

<sup>a</sup> 1 m = 3.28 ft

Table 13. Other forest diseases

Organism	Host(s)	Remarks
<i>Armillaria mellea</i> (Vahl ex Fr.) Kummer Shoestring root rot	rO	associated with oak mortality at several locations in the Huronia and Maple districts
<i>Cenangium ferruginosum</i> Fr. ex Fr. Cenangium dieback of pines	scP	medium-to-heavy infections at two locations in Oro Twp, Huronia District
<i>Ceratocystis ulmi</i> (Buism.) C. Moreau Dutch elm disease	wE	continued to kill many of the remaining elms in the Region

(continued)



Table 13. Other forest diseases (continued)

Organism	Host(s)	Remarks
<i>Chloridium</i> sp.	blCh	associated with stem decay on roadside trees in Ancaster Twp, Cambridge District
<i>Coleosporium asterum</i> (Diet.) Syd. A needle rust on pine	rP	medium-to-heavy infections in Clarke, Mariposa and Bexley twp, Lindsay District and in Uxbridge Twp, Maple District
<i>Coryneum kunzei</i> Cda. Coryneum canker	wO, rO	associated with branch and twig dieback in Brantford and South Dumphries twp, Cambridge District
<i>Cylindrocladium floridanum</i> Sob. and Seymour Cylindrocladium root rot	various hosts	little damage in Midhurst Forest Station following fumigation of infected seedbeds in 1976
<i>Cylindrosporella caryae</i> (Pk.) Petr. Hickory leaf anthracnose	big shellbark hickory	heavy leaf anthracnose near Glen Marins, Cambridge District
<i>Cytospora chrysosperma</i> (Pers.) Fr. Cytospora canker of poplar	hybrid poplar tA	severe damage to one hybrid poplar plantation in Flos Twp, Huronia District; light on trembling aspen along Highway 400 in Medonte Twp, Huronia District
<i>Cytospora</i> sp. Cytospora canker	rM, beech rO, Eur. L	associated with branch cankers and dieback at a number of locations in Huronia, Maple and Cambridge districts
<i>Diplodina salicis</i> West. Willow dieback	Arctic willow	light infection on a planted hedge in the town of Lindsay

(continued)

Table 13. Other forest diseases (continued)

Organism	Host(s)	Remarks
<i>Discella acerinum</i> (Westend.) Arx Anthracnose on maple	sM	found in conjunction with leaf anthracnose at a number of locations
<i>Endothiella</i> sp. Canker of privet	Privet	caused severe damage to hedge trees in the town of Lindsay
<i>Fomes annosus</i> (Fr.) Karst. Annosus root rot	various pines	continued to damage pine plantations at a number of locations in the Region
<i>Gymnosporangium bethelii</i> Kern. Cedar-apple rust	Haw	very heavy infections near Guelph, Cambridge District and near Bolton, Maple District
<i>Linospora tetraspora</i> G.E. Thompson A leaf blight of balsam poplar	bPo	heavy infections on scattered clumps of trees in Nottawasaga Twp, Huronia District
<i>Melampsora medusae</i> Thuem. Larch needle rust	tL	medium infection in Uxbridge Twp, Maple District
<i>Melanconium oblongum</i> Berk. Butternut branch dieback	Bu	severe branch canker damage near Hornby, Cambridge District
<i>Nectria cinnabarina</i> (Tode ex Fries) Fries Coral spot	scarlet maple	damaging one ornamental tree in the town of Lindsay
<i>Pestalotia</i> sp. A blight on cedar	eC	associated with severe damage in two seedbeds at Midhurst Forest Station
<i>Phyllosticta tiliae</i> Sacc. & Speg. Basswood leaf spot	Ba	medium-to-heavy infections in Onondaga Twp, Cambridge District

(continued)

Table 13. Other forest diseases (concluded)

Organism	Host(s)	Remarks
<i>Pucciniastrum</i> sp. A rust	various hosts	heavy infection on ground cover in Ops Twp, Lindsay District
<i>Tubakia dryina</i> (Sacc.) Sutton Oak leaf spot	rO	associated with chlorotic foliage at several loca- tions in South Dumphries Twp, Cambridge District
Pine deterioration	rP	two pockets of approxi- mately 0.2 ha (1/2 acre) of mortality occurred in a 9 m (30 ft) red pine hedge- row on county road 15 in Hamilton Twp, Lindsay District (Cause of the damage was not determined.)

APPENDIX

# CENTRAL REGION

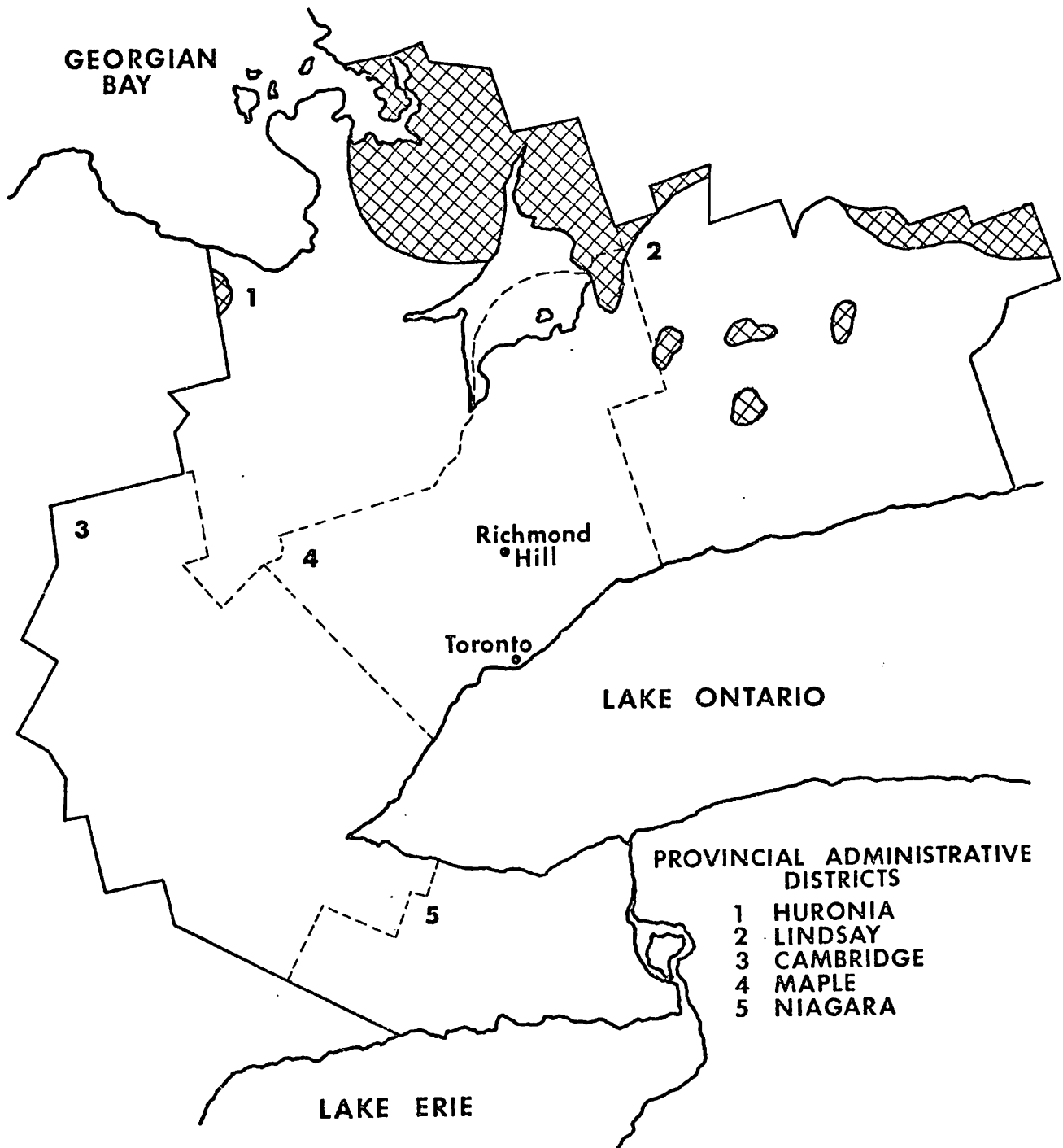


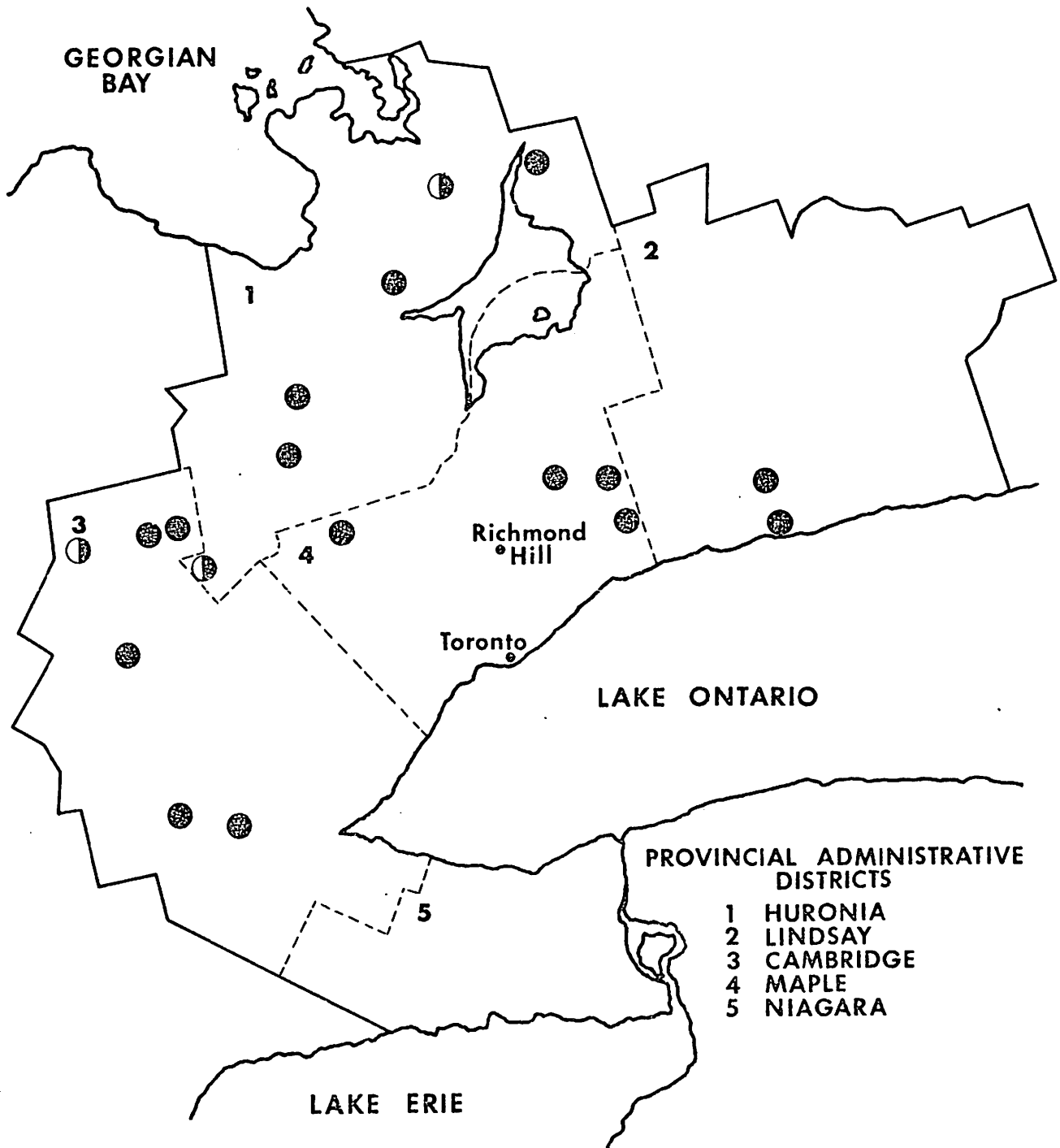
Fig. A1. FOREST TENT CATERPILLAR

Areas within which infestations occurred  
in 1977

Moderate-to-heavy defoliation . .



# CENTRAL REGION



**PROVINCIAL ADMINISTRATIVE DISTRICTS**

- 1 HURONIA
- 2 LINDSAY
- 3 CAMBRIDGE
- 4 MAPLE
- 5 NIAGARA

Fig. A2. LARCH SAWFLY

Areas within which infestations occurred in 1977

Heavy infestation . . . . . ●

Moderate infestation . . . . . ◐