FOREST INSECT AND DISEASE SURVEYS IN THE CENTRAL REGION OF ONTARIO, 1974

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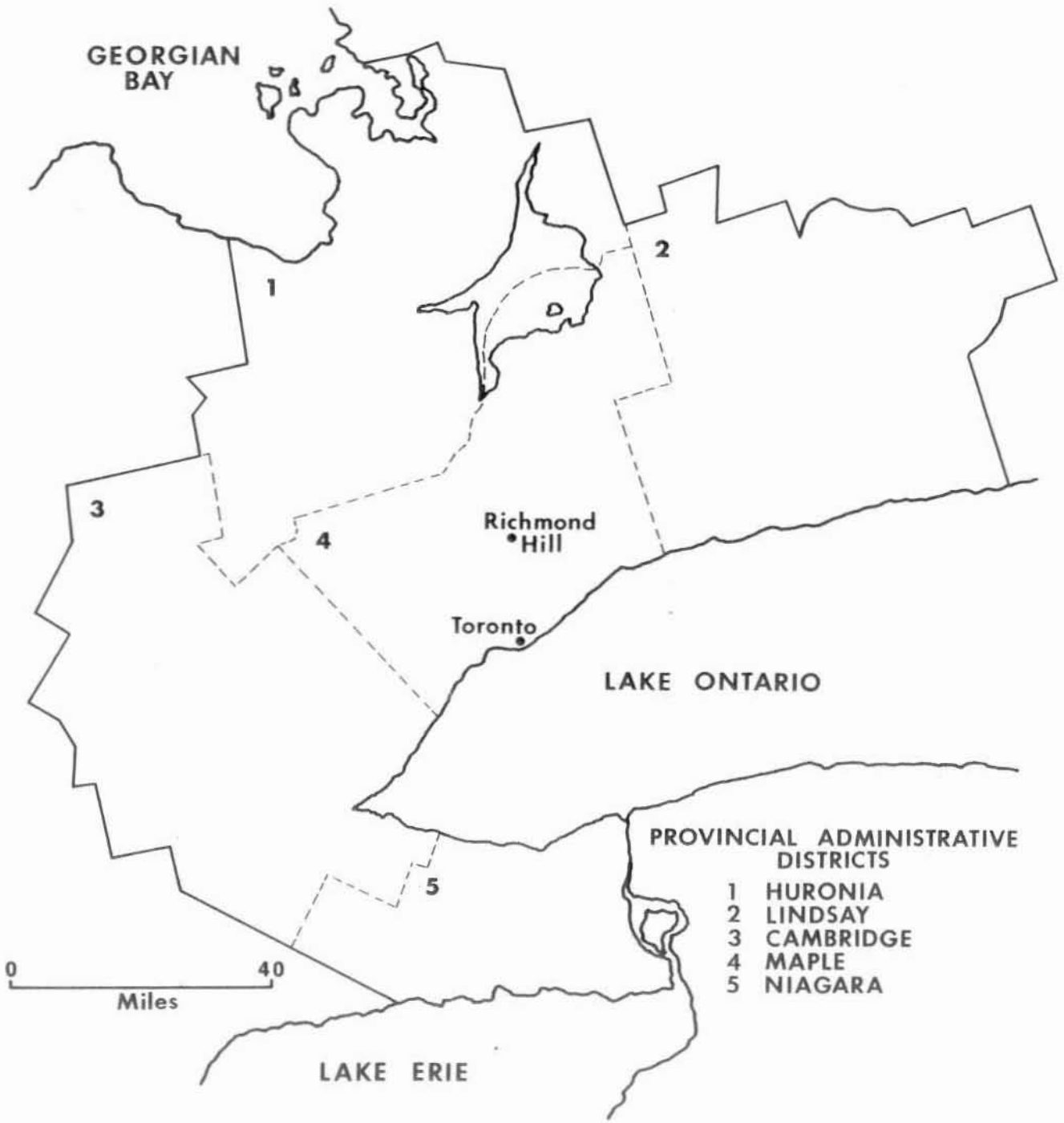
CENTRAL REGION



ACKNOWLEDGEMENTS

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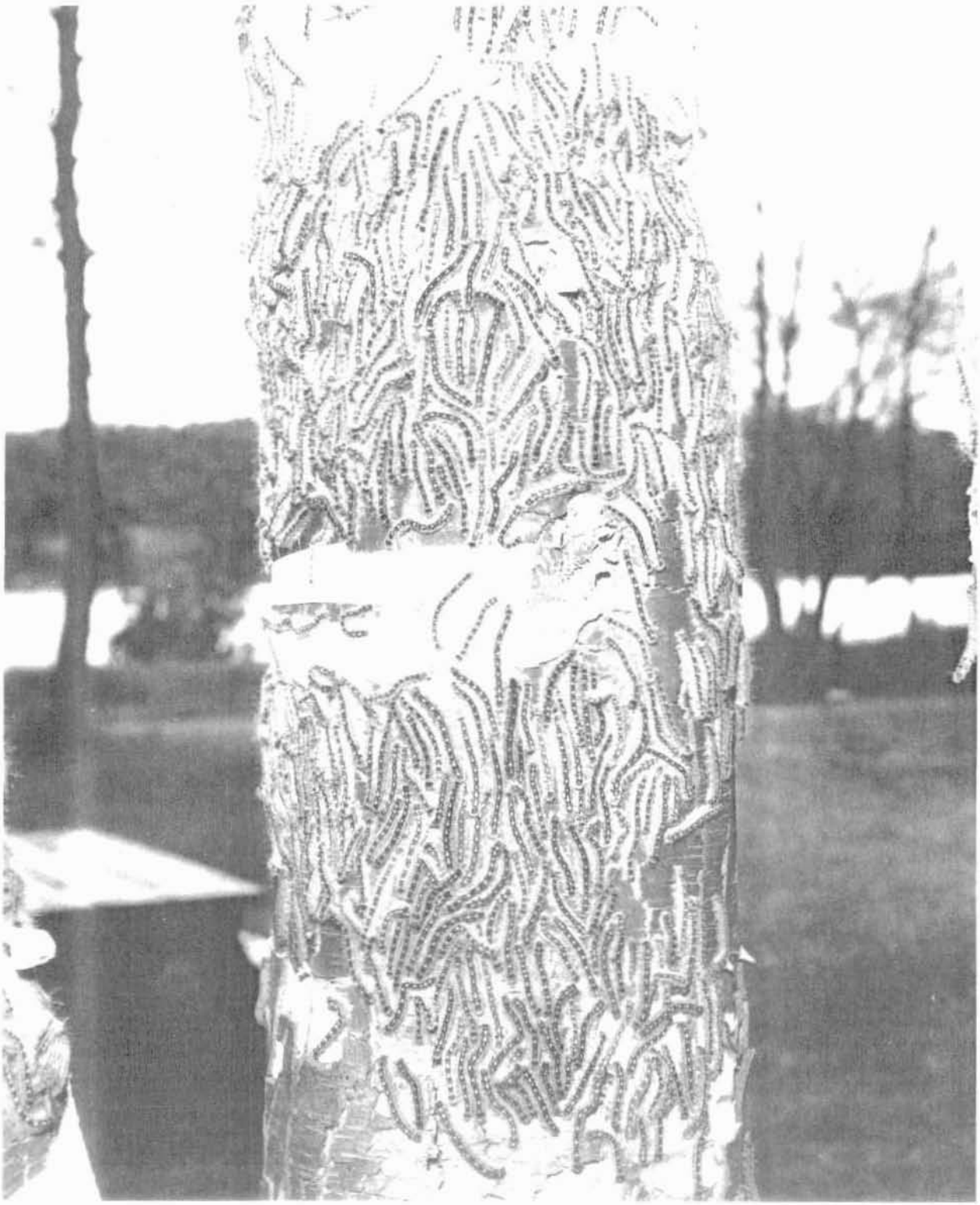

Frontispiece. Forest tent caterpillars massed on the trunk of a white birch tree in a park setting.

SURVEY HIGHLIGHTS

A relatively unknown organism in Ontario, *Cylindrocladium floridanum* Sob. and Seymour, was found associated with mortality and malformation of 2-0 black spruce seedlings in a compartment of the Midhurst Nursery. Dutch elm disease plots established in 1973 and checked again in 1974 were used to measure annual rates of elm mortality in the Region. Top-killing and branch mortality of Scots pine, a problem of major concern to Christmas tree growers in 1973, did not reappear. The pathogen *Lophodermium pinastri* (Schrad. ex Fr.) Chev., a severe nursery problem in 1973, persisted at low levels. A fungus disease, *Botrytis cinerea* Pers. ex Fr., was associated with poor development of 3-0 white spruce seedlings.

Populations of the European pine shoot moth, balsam fir sawfly, fall webworm and yellowheaded spruce sawfly intensified and indications are that damage to hardwood forests by the forest tent caterpillar might appear in 1975. Heavy damage to cedars by leafminers continued to cause public concern.

In late April and early May, the Chemical Control Research Institute in Ottawa carried out spray trials, using Methoxychlor and Sevin, against the white pine weevil at numerous points in the Huronia District. The Ontario Ministry of Natural Resources continued to cut out localized *Fomes annosus* infection centers and, in an attempt to prevent spread, treated freshly cut stumps with a wood-destroying fungus, *Peniophora gigantea* (Fr.) Massee. Treatment with Maneb was effective in keeping infections of *Lophodermium pinastri* at a tolerable level in the Midhurst Nursery.

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INSECTS

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

Following several years of moderate-to-severe damage to the foliage of eastern white cedar (*Thuja occidentalis* L.) in several parts of southern Ontario, high populations of this complex of cedar leafminers again caused severe browning south of a line between Luther Lake in the northern part of the Cambridge District and south of Lake Simcoe to the eastern extremity of the Lindsay District. Cumulative destruction of foliage has resulted in severe twig and branch mortality in numerous stands in the infested area and tree mortality was most evident in the Cambridge, Orangeville, Schomberg and Uxbridge areas in Huronia, Maple and Cambridge districts. In the Lindsay District tree mortality intensified in the Peterborough–Lindsay area and along Highway 45 north of Cobourg. More severely damaged cedar stands were present in the northern part of the Region than in previous years. Again *A. thuiella* was the most abundant species observed and moderate-to-high parasitism was noted at a few widely scattered locations.

Severe tip browning in several areas apparently caused by a weather condition greatly contributed to an increasing amount of public concern.

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Numbers of this budworm sufficient to cause light defoliation occurred in the southern part of the Huronia District and in Albion Township in the Maple District. Light infestations in 1973 on Scots pine (*Pinus sylvestris* L.) and jack pine (*Pinus banksiana* Lamb.) trees in Tecumseh and Albion townships increased to medium intensity. Larval counts increased from 206 and 134 to 407 and 391, respectively. Defoliation was of little significance elsewhere in the Region.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of damage surveys, population sampling, and egg-mass counts have been included with those of other survey regions in a special information report by G. M. Howse et al. (O-X-228). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1974 and gives infestation forecasts for the province for 1975.

Larch Casebearer, *Coleophora laricella* Hbn.

A small, heavy infestation occurred for the second consecutive year in a stand of European larch (*Larix decidua* Mill.) in Whitchurch

Township in the Maple District. Medium infestations in Albion Township in the Maple District and in Mulmur Township in the Huronia District declined to light intensity. Light damage was observed in tamarack (*Larix laricina* [Du Roi] K. Koch) and European larch stands at several other points in the Region.

Oak Leaftier, *Croesia semipurpurana* (Kft.)

In the Lindsay District defoliation was severe in approximately 16,000 acres (6,480 ha) of red oak (*Quercus rubra* L.) in the Durham–Ganaraska and Northumberland county forests and moderate to severe in two smaller pockets of approximately 500 acres (202 ha) each in Manvers and Haldimand townships. In the Maple District light infestation increased and caused moderate-to-severe damage in several red oak stands in the Uxbridge area whereas an infestation in Whitchurch Township, which had been heavy, declined to light. In Mulmur and Tosorontio townships in the Huronia District 1,300 acres (526 ha) of mixed hardwood with a high content of red oak, harboring high larval populations, were sprayed in the spring of 1973 using 0.85 lb (317.25 g) Sevin 4 oil in 0.78 qt (Imperial) (886.46 ml) of spray mixture per acre. Random population measurements before and after spraying showed no appreciable population reduction after spraying and only small patches of moderate defoliation occurred in this area in 1974. Light infestations with occasional localized pockets of moderate defoliation recurred in Vespra, Oro and Tiny townships and new light infestations were noted on the Niagara Peninsula, Niagara District (see Appendix, Fig. A1).

Deterioration of red oak became more evident in areas infested for several years. Tree mortality ranged from 5% to 10% at several locations in the Huronia District and up to 20% at one point in the Lindsay District. The root rot *Armillaria mellea* (Vahl ex Fr.) Kummer is commonly associated with tree mortality and the Ontario Ministry of Natural Resources is justifiably concerned.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

With one exception, damage by this shoot borer remained low in the Region for the third consecutive year (Table 1). Heaviest damage was recorded in a red pine (*Pinus resinosa* Ait.) plantation in Rama Township where 81% of the 10-ft (3.05-m) trees showed evidence of one or more attacks and 9% of the trees had damaged leaders. Light shoot damage was observed in plantations of red pine, white pine (*Pinus strobus* L.) and Scots pine elsewhere in the Region.

Table 1. Summary of shoot damage by the eastern pine shoot borer in the Central Region in 1974

Location (Twp)	Tree species	Avg ht of trees (ft)[a]	Trees infested (%)	Avg no. of attacks per infested tree	Trees with leaders attacked (%)
Huronia District					
Rama	rP	10	81	2.0	9
W. Gwillimbury	rP	8	28	1.0	2
Rama	rP	7	26	1.5	4
Sunnidale	rP	6	32	1.3	3
Maple District					
Uxbridge	rP	12	31	1.0	3
Cambridge District					
Puslinch	wP	6	25	1.2	4

[a] 1 ft = 0.30 m

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

A heavy infestation of this leafminer persisted in the Angus–Base Borden area for the third consecutive year. Elsewhere in the Huronia District white birch (*Betula papyrifera* Marsh.) was moderately damaged on the east side of Highway 24 between Maple Valley and Singhampton in Nottawasaga Township. In the Maple District a new pocket of heavy infestation occurred on white birch in mixed stands of hardwoods in Uxbridge Township, causing severe leaf browning. At Bellwood Lake in the Cambridge District a medium infestation declined to light intensity. As in 1973, individual or small clumps of ornamental birches suffered severe leaf damage at numerous locations in the Region.

Fall Webworm, *Hyphantria cunea* Dru.

The highest larval population was recorded in the Port Severn–Honey Harbour–Six Mile Lake area where a medium infestation increased to heavy intensity. In this area numerous single trees and small groups of black ash (*Fraxinus nigra* Marsh.) and trembling aspen (*Populus tremuloides* Michx.) trees were completely defoliated and literally enveloped in webbing (Fig. 1). Also in the Huronia District a medium infestation recurred mainly on black ash in the Washago area in Orillia

Township. High populations were also noted at several locations in the southern part of the Lindsay District. The black ash growing in swamps along Highway 2 east of Cobourg seemed prone to attack and many trees were covered with unsightly webbing. Medium infestations on a variety of host species in the southern part of the Cambridge District and in the Niagara Peninsula declined to generally light intensity. Populations elsewhere in the Region were of little significance.

Figure 1. Defoliation and webbing on black ash by fall webworm.

Eastern Tent Caterpillar, *Malacosoma americanum* F.

Heavy infestations of this common pest of deciduous host species caused severe defoliation of cherry (*Prunus* spp.), apple (*Malus* spp.),

hawthorn (*Crataegus* spp.) and trembling aspen trees in Essa, Baxter, Matchedash, Orillia, Mara, Oro, Tiny, Tay and Medonte townships in the Huronia District. High populations persisted throughout the Lindsay District and counts of 500 or more nests per measured mile (1.61 km) were common. Small localized pockets of light-to-medium infestation were observed elsewhere in the Huronia District and at widely scattered locations in the Maple, Cambridge and Niagara districts.

This species spends the winter in the egg stage on the twigs of host species and larval emergence usually coincides with the bursting of the new buds early in May. Infestations most commonly occur on open-grown trees and shrubbery, and tents are most conspicuous along fencerows and roadsides during late May and early June. Localized epidemics cause public concern and technicians are frequently called upon to handle inquiries.

A Birch Leafminer, *Messa nana* Klug

This introduced leafmining sawfly was first discovered in Ontario in 1967 and positively identified from adults captured in the spring of 1968. Initially, light damage was confined to open-growing and fringe white birch trees in a few townships in the Lindsay District and in the vicinity of Uxbridge in the Maple District. According to surveys carried out in 1974 this pest is found at scattered locations south of a line between Goderich in the west and Pembroke in the east.

Severe foliar damage occurred in the Ganaraska—Durham County Forest, Lindsay District, for the third consecutive year (Table 2). Light infestation recurred on open-grown and fringe white birch trees in Oro and Flos townships in the Huronia District and light-to-medium infestations persisted in West Gwillimbury Township, Huronia District and near Uxbridge in the Maple District. The status of this leafminer remained unchanged elsewhere in the Region.

Table 2. Summary of damage by *Messa nana* in the Lindsay District from 1972 to 1974 (Counts were based on the examination of 100 leaves selected randomly from three trees at each location.)

Location (Twp)	Host	Avg DBH (in.)[a]	Leaves mined		
			1972	1973 (%)	1974
Lindsay District					
Clarke	wB	5	100	100	100
Haldimand	wB	4	100	70	67

[a] 1 in. = 2.54 cm

Balsam Fir Sawfly, *Neodiprion abietis* complex

Following several years of endemic populations in the Region a buildup in larval numbers occurred in 1973. Light-to-medium infestations were noted in 1974. Balsam fir (*Abies balsamea* [L.] Mill.) growing in open stands and pasture fields usually harbored the highest populations. Moderate defoliation occurred in several areas in the Maple District and in the Shelburne–Orangeville and Angus–Creemore areas in Huronia District. Light-to-moderate defoliation was observed in Oro and Medonte townships in Huronia District. A new localized pocket of light infestation occurred in a partially cut-over area near Puslinch Lake in the Cambridge District.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

In the Lindsay District slight increases occurred in young red pine plantations in Douro and Belmont townships. At Balsam Lake Park in Bexley Township where colonies were removed by hand and insecticide spraying was carried out in 1973, very few colonies appeared. Light infestations recurred in red pine plantings near Sebright in Rama Township in the Huronia District, where at one point eight colonies were counted on 100 7-ft (2.13-m) trees examined. Higher numbers of colonies were counted on scattered 25-ft (7.62-m) red pine trees in the Severn Falls area in Matchedash Township.

A Jack Pine Sawfly, *Neodiprion pratti banksianae* Roh.

For the second consecutive year, this sawfly caused defoliation in a stand of 25-ft (7.62-m) jack pine in Albion Township, Maple District. Feeding, in association with that by *N. sertifer*, caused approximately 25% defoliation. Counts made at three sample points in the Huronia District showed that numbers were virtually the same as in 1973 (Table 3) and observations elsewhere confirmed this trend.

Table 3. Summary of jack pine sawfly colony counts at three points in the Huronia District from 1972 to 1974 (Counts were based on the examination of 100 trees at each location.)

Location (Twp)	Host	Avg ht of trees (ft)[a]	Avg no. of colonies per infested tree			Trees infested (%)		
			1972	1973	1974	1972	1973	1974
Huronia District								
Melancthon	jP	20	2.6	3.0	3.5	53	34	40
Tosorontio	jP	20	5.4	3.1	3.0	100	63	66
W. Gwillimbury	jP	20	4.0	2.5	3.0	64	56	50

[a] 1 ft = 0.30 m

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

Generally larval populations were low and resembled those of 1973 (Table 4). Severe defoliation was recorded in a plantation of 8-ft (2.44-m) Scots pine trees in Beverly Township, Cambridge District. Moderate defoliation was noted on Scots pine in the Angus–Creemore and Dufferin County areas of the Huronia District, in a plantation of 25-ft (7.62-m) jack pine trees near Palgrave and in a few Scots pine plantings in the vicinity of Ballantrea in the Maple District. Open-grown 20-ft (6.10-m) Scots and jack pine trees at a golf course near Dunnville in the Niagara District were also moderately damaged. Elsewhere feeding was light and of little significance.

Table 4. Summary of European pine sawfly colony counts and degrees of infestation in four districts from 1972 to 1974 (Counts were based on the examination of 100 trees at each location.)

Location (Twp)	Host	Avg ht of trees (ft)[a]	Avg no. of colonies per infested tree			Trees infested (%)			Degree of infestation[b]
			1972	1973	1974	1972	1973	1974	
Huronia Dist.									
Adjala	ScP	15	4.0	1.0	1.0	84	25	14	L
Mulmur	ScP	15	7.0	4.0	2.0	95	75	50	L
Tosorontio	ScP	12	8.0	1.0	1.0	100	33	33	L
Flos	ScP	15	-	1.0	1.0	-	30	25	L
Sunnidale	ScP	12	-	3.0	1.0	-	80	40	L
Maple Dist.									
Albion	ScP	15	5.0	1.0	2.0	80	30	60	L
Whitchurch	ScP	15	-	-	2.0	-	-	73	L
Cambridge Dist.									
Beverly	ScP	8	-	-	6.0	-	-	100	H
Lindsay Dist.									
Clarke	ScP	7	3.0	1.0	1.0	100	20	61	L
Clarke	rP	5	-	-	1.0	-	-	30	L
Cartwright	ScP	6	4.0	1.0	1.0	80	37	86	L
Mariposa	rP	3	-	-	1.0	-	-	14	L
Verulam	rP	5	1.0	1.0	1.0	78	10	31	L

[a] 1 ft = 0.30 m

[b] L = light, H = heavy

As has been the practice for the past several years I was again involved in locating infestations and advising on the proper methods for collecting and handling of diseased larvae in a cooperative *sertifer* virus program with the Ontario Ministry of Natural Resources. Personnel from the Insect Pathology Research Institute (Sault Ste. Marie), who have also participated actively in this program, prepared, from virus-killed larvae, 2300 g (73.6 oz) of virus for suspension. The preparation was used by Ontario Ministry of Natural Resources personnel and private tree growers in various infestations as a control measure.

Surveys to determine the spread of the European parasite, *Lophyroplectus luteator* (Thunb.), introduced near Chatsworth in 1962, were continued through the submission of last-instar larvae from 23 locations beyond the limits of known spread. Rearing of the cocoons by laboratory personnel and parasite identification determined that the parasite has spread mainly eastward and now is attacking the sawfly as far away as the Lindsay District. Numerous collections to the south of this release point have failed to reveal any significant spread to the south to date.

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

In the Lindsay District severe defoliation of 5- to 7-ft (1.52- to 2.13-m) planted white spruce (*Picea glauca* [Moench] Voss) trees recurred in the Balsam Lake Park in Bexley Township for the third consecutive year. Light-to-moderate defoliation of ornamental white spruce was also noted in Canal Lake Park in Eldon Township. In the Huronia and Maple districts larval populations increased noticeably following several years of endemic populations. Young planted white spruce and ornamentals were moderately defoliated at several locations in both districts. Varying degrees of damage were observed occasionally elsewhere in the Region.

White Pine Weevil, *Pissodes strobi* (Peck)

At Orr Lake in Flos Township where a persistent heavy infestation had occurred in 1973, a spray operation carried out by R. F. De Boo of the Chemical Control Research Institute, Ottawa, using 3:1 fuel oil and Methoxychlor, reduced the percentage of leaders attacked from 78 in 1973 to 16 in 1974. Elsewhere in Huronia District 38% of young white pine trees at a location in Oro Township had weevilled leaders and damage levels increased in parts of Matchedash and West Gwillimbury townships. In the Maple District 36% of the leaders were infested in a young white pine plantation in Whitchurch Township and high damage was recorded in Haldimand, Clarke and Verulam townships in the Lindsay District (Table 5). Fluctuations in damage levels at several other sample points in the Region were of lesser consequence (see Appendix, Fig. A2).

The Insect and Disease Survey Unit cooperated with the Chemical Control Research Institute in the spraying of 16 properties in the townships of Medonte, Flos and Oro in late April and early May, using fuel oil and Methoxychlor on 14 properties and 1:1 fuel oil and Sevin on the remaining two. Total acreage sprayed was 722 (292.4 ha). Results of this operation will be presented elsewhere.

Table 5. Summary of leader damage by white pine weevil in four districts from 1972 to 1974 (Counts were based on the examination of 100 trees at each location.)

Location (Twp)	Host	Avg DBH (in.)[a]	Trees weevilled 1972	1973 (%)	1974
Huronia District					
Matchedash	wP	7	11	6	15
Oro	wP	3	-	-	38
Oro	nS	5	23	5	11
Vespra	nS	7	14	9	8
W. Gwillimbury	wP	5	6	7	17
Flos	wP	3	60	78	16
Maple District					
Whitchurch	wP	3	-	-	36
E. Gwillimbury	wP	6	11	5	7
Cambridge District					
Puslinch	wP	2	-	-	1
Lindsay District					
Clarke	wP	4	-	8	11
Haldimand	wP	3	-	27	37
Clarke	wP	2	-	-	41
Verulam	wP	5	-	-	43

[a] 1 in. = 2.54 cm

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

European larch was heavily infested at numerous locations in the Region (see Appendix, Fig. A3). In the Huronia District heavy infestations occurred at the Midhurst Nursery in Vespra Township and in the vicinity of Bradford in West Gwillimbury Township. A medium infestation persisted in the Connor Tract in Adjala Township but the heavy infestations in Medonte, Oro, Innisfil and Tecumseh townships declined

to light-to-medium intensity. In the Maple District larval populations increased generally and moderate-to-severe defoliation was noted in several plantations in the Newmarket–Uxbridge area. In the Cambridge District heavy infestations were recorded in Wilmot and S. Dumfries townships and a light infestation in Woolwich Township increased to medium-to-heavy intensity. Moderate defoliation of Japanese larch (*Larix leptolepis* [Sieb. & Zucc.] Gord.) occurred for the third consecutive year in Clarke Township, Lindsay District. Light defoliation of tamarack was observed at scattered points in the Region.

European Pine Shoot Moth, *Rhyacionia buoliana* Schiff.

Following several years of endemic populations larval numbers of this shoot moth increased substantially in the Cambridge District and in the southwestern part of the Huronia District for the second consecutive year (Fig. 2). The first two series of counts (Table 6) are representative of increasing numbers. Heavy infestations were recorded on 15-ft (4.57-m) Scots pine trees and 4-ft (1.22-m) red pine trees near Shelburne in Melancthon Township. West of Galt in North Dumfries Township 80% of the bud clusters in a young red pine plantation were infested. Elsewhere in the Cambridge District medium infestations were recorded in Puslinch, Eramosa and West Luther townships and in Amaranth Township in Huronia District. Several ornamental Mugho pine (*Pinus mugho* Turra var. *mughus* Zenari) were severely damaged in the city of Barrie. Light infestation was observed more commonly than in 1973.

High numbers of larvae feeding in the new shoots of young infested trees often cause stem malformation, giving the trees a very unsightly appearance. Trees that do recover from attack are quite often twisted or otherwise distorted, and this renders them commercially useless.

Table 6. Summary of shoot damage by the European pine shoot moth in two districts from 1972 to 1974 (Counts were based on the examination of 100 bud clusters at each location.)

Location (Twp)	Host	Avg ht of trees (ft)[a]	Bud clusters infested 1972	1973 (%)	1974
Cambridge District					
Puslinch	rP	5	3	18	26
Eramosa	rP	5	16	26	39
N. Dumfries	rP	6	–	–	80
Huronia District					
Melancthon	ScP	15	–	–	49

[a] 1 ft = 0.30 m

Figure 2. Typical shoot damage on red pine by European pine shoot moth.

Table 7. Other forest insects

Insect	Host(s)	Remarks
Acleris variana Fern.	wS	light defoliation common in Huronia, Maple and Cambridge districts
Alsophila pometaria (Harr.)	Ba, sM, wE	very light damage in Huronia and Cambridge districts
Altica populi Brown	bPo	caused moderate damage at several points in Huronia and Maple districts
Anisota finlaysoni Riotte	wO	caused light-to-severe defoliation of fringe and open-grown trees in the southern part of the Region

(continued)

Table 7. Other forest insects (continued)

Insect	Host(s)	Remarks
Aphrophora parallela (Say)	ScP, wP	moderate damage in Darlington Twp, Lindsay District, medium in E. Gwillimbury Twp, Maple District
Argyresthia oreasella Clem.	Haw	caused moderate shoot damage in W. Gwillimbury Twp, Huronia District
Bucculatrix ainsliella Murt.	rO	light-to-moderate damage in Mulmur Twp, Huronia District, and light in Uxbridge Twp, Maple District
Caulocampus acericaulis MacG.	sM	caused light leaf drop in Huronia and Maple districts
Cecidomyia reeksi Vock.	jP	scattered trees suffered moderate-to-severe damage
Cenopis pettitana Rob.	Ba	low larval populations in Huronia and Cambridge districts
Choristoneura conflictana Wlk.	tA	caused severe defoliation of approximately 100 acres in the Angus–Base Borden area, Huronia District
Coleophora betulivora McD. and *C. cinerella* Cham.	wB	low populations common in Maple and Huronia districts
Conophthorus resinosae Hopk.	rP	caused light mortality of new shoots in a 35-year-old plantation in Tiny Twp, Huronia District
Corythucha sp.	Ba	moderate damage in Whitchurch Twp, Maple District
Datana integerrima G. & R.	Wa	moderate damage on scattered trees in Maple, Cambridge and Niagara districts
Datana ministra Dru.	Ba, wE	moderate-to-heavy damage in Huronia, Maple and Cambridge districts; generally confined to open-grown and fringe trees

(continued)

Table 7. Other forest insects (continued)

Insect	Host(s)	Remarks
Dioryctria disclusa Heinr.	ScP	caused light-to-moderate cone damage in Maple and Huronia districts
Diprion hercyniae (Htg.)	wS	Populations of this potential forest pest remained low for the fourth consecutive year.
Diprion similis (Htg.)	wP, ScP rP	Larval populations declined notably in 1974; e.g., in Pickering Twp only seven larvae were collected in a 20-mat sample compared with 182 in 1973.
Epinotia aceriella Clem.	sM	heavy infestation in Humberstone Twp, Niagara District
Exotelcia dodecella Linn.	ScP	observed commonly but in low numbers in the Region
Fenusa ulmi Sund.	wE	localized patches of light-to-moderate leaf mining in the Region
Hylobius radicis Buch.	ScP, jP	status of this insect unchanged from 1973
Lepidosaphes ulmi (Linn.)	bAs	caused light branch mortality in Orillia Twp, Huronia District
Lithocolletis hamadryadella Clem.	wO	moderate leafmining in Beverly Twp, Cambridge District
Malacosoma disstria Hbn.	sM, tA	highest numbers of larvae in Medonte Twp, Huronia District and in Erin Twp, Cambridge District (see Frontispiece)
Neodiprion nanulus nanulus Schedl	rP	low populations in Tiny Twp, Huronia District
Neodiprion virginianus complex	jP	moderate damage on a few open-growing trees in Mara Twp, Huronia District
Periphyllus lyropictus (Kessler)	nM	Aphids were responsible for severe leaf drop on ornamentals on the Niagara Peninsula and in the Hamilton area.

(continued)

Table 7. Other forest insects (concluded)

Insect	Host(s)	Remarks
Pikonema dimmockii (Cress)	wS	low populations in Huronia and Maple districts
Pineus spp.	wP	patches of medium-to-heavy infestation in several beds of 3-0 stock in the Midhurst Nursery
Pineus strobi (Htg.)	wP	heavy infestation of a 0.5-acre (0.2-ha) plantation of semimature trees in the Ganaraska-Durham County forest, Lindsay District; occasional trees heavily infested elsewhere
Pristiphora geniculata (Htg.)	Mo	caused moderate defoliation of scattered open-growing trees in the Region
Proteoteras aesculana Riley	siM	light boring of the terminal shoots on 3-ft (0.9-m) trees in the Midhurst Nursery
Pseudexentera oregonana Wlshm. and *Sciaphila duplex* Wlshm.	tA	A combination of these two leaf rollers caused moderate damage in a 100-acre (40-ha) stand in King Twp, Maple District
Pulicalvaria piceaella (Kft.)	wS	moderate needle mining in Seneca Twp, Niagara District, in Medonte Twp, Huronia District and in E. Gwillimbury Twp, Maple District
Zelleria haimbachi Busck.	jP	medium-to-heavy infestations in Adjala and W. Gwillimbury twp, Huronia District

TREE DISEASES

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

Increased mortality occurred in two specific red pine plantations in Clarke and Hope townships in the Lindsay District where tree mortality has been 29% and 19%, respectively, over several years. Slight increases also occurred in 4-ft (1.22-m) high red pine plantations in Essa and Sunnidale townships (Table 8), and in a cedar hedge in Vespra Township, Huronia District. The disease was responsible for single tree mortality of red pine and Scots pine at numerous locations in the Region and was also found associated with mortality of immature and mature red oak trees, particularly in the Huronia and Maple districts.

Table 8. Summary of damage to red pine by Armillaria root rot in the Huronia District in 1974

Location (Twp)	Avg ht of trees (ft)[a]	Trees affected (%)	Tree mortality (%)
Essa	4	6	6
Sunnidale	4	3	3

[a] 1 ft = 0.30 m

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

Infections caused by this introduced organism were first found in Ontario in 1946 and have since killed most of the elm (*Ulmus* sp.) trees in southern Ontario. In more recent years the disease has become well established as far north as elms occur in the province.

A high incidence persisted in the central and northern parts of the Central Region, though to a lesser degree in accordance with the lower elm content. Sampling points were selected in 1973 and elm trees were described as a basis for determining the annual rate of mortality. Determinations made in 1974 revealed a high degree of variation ranging from 0% to 57% (Table 9), with locations of high mortality corresponding with high infection levels in 1973.

Table 9. Rate of mortality by Dutch elm disease during a 1-yr period (1973-1974) in the Central Region

Plot location (Twp)	No. of living trees 1973	Mortality rate, 1973-1974 (%)
Huronia District		
Tiny	38	57
Nottawasaga	40	56
Rama	40	10
Mono	35	52
Maple District		
Caledon	40	27
Scott	34	18
Lindsay District		
Belmont	40	0

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

This organism persisted at virtually the same low levels of infection as reported in 1973. Although occasional understory trembling aspen trees were severely infected, in areas where quantitative data were taken, overall foliage damage did not exceed 10%. The highest incidence of the disease was recorded in Humberstone Township in the Niagara District where 60% of the trees were infected (Table 10).

Table 10. Summary of foliar damage on trembling aspen caused by ink spot of poplar disease in two districts in 1974

Location (Twp)	Acres affected[a]	Incidence (%)	Level of defoliation (%)
Huronia District			
Orillia	100	45	5
Flos	100	50	5
Niagara District			
Humberstone	50	60	10

[a] 1 acre = 0.40 ha

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

All levels of infection occurred commonly in Huronia, Maple, Lindsay and Cambridge districts. The disease was most prevalent in unthinned and unpruned pure stands of white pine. These growing conditions appear to favor the disease. Incidence in a 15-acre (6.08-ha) plantation of 8-year-old white pine in the Balsam Lake Park, Lindsay District, was 25%, with 9% of the trees severely diseased.

Cylindrocladium Root Rot, *Cylindrocladium floridanum* Sob. and Seymour

The Insect and Disease Survey Unit has been on the alert for the presence of this disease for several years. The organism has created a problem in nurseries in the United States and is known to affect a wide variety of tree species. In 1974 the organism was first identified in Ontario by culture of 2-0 black spruce seedlings from a compartment in the Midhurst Nursery, Huronia District. The organism may cause damping off, root rot and/or shoot blight. Root rot frequently results in the loss of the main root of seedlings (Fig. 3A and 3B). Late in the fall of 1974 the disease was confirmed from other compartments in the nursery and on coniferous seedlings other than black spruce. Joint deliberations have been held with the Ontario Ministry of Natural Resources and control measures are being considered in an attempt to minimize losses within the nursery.

Annosus Root Rot, *Fomes annosus* (Fr.) Karst.

Although several new pockets of infection were recorded in 1973, no new infections were evident in 1974. The Ontario Ministry of Natural Resources continued to remove trees from known infections and this year treated freshly cut stumps with the fungus *Peniophora gigantea* (Fr.) Massee. When two more infected areas in Essa Township are cut, all known areas of active infection in the Region will have been treated. Also, as a preventive measure, the Ontario Ministry of Natural Resources treats with sodium nitrate all cut stumps in thinning operations within endangered areas.

Pine Needle Cast, *Lophodermium pinastri* (Shrad. ex Hook.) Chev.

Following a severe outbreak of this organism in the Midhurst nursery in 1973, infections subsided to tolerable levels in 1974. Fruiting was present on the lower needles of jack pine and red pine but needle discoloration was of little significance. A light infection also occurred in one bed of 3-0 red pine stock in Orono Nursery, Lindsay District. Periodic applications of Maneb appeared to contribute substantially to the reduction of infection levels.

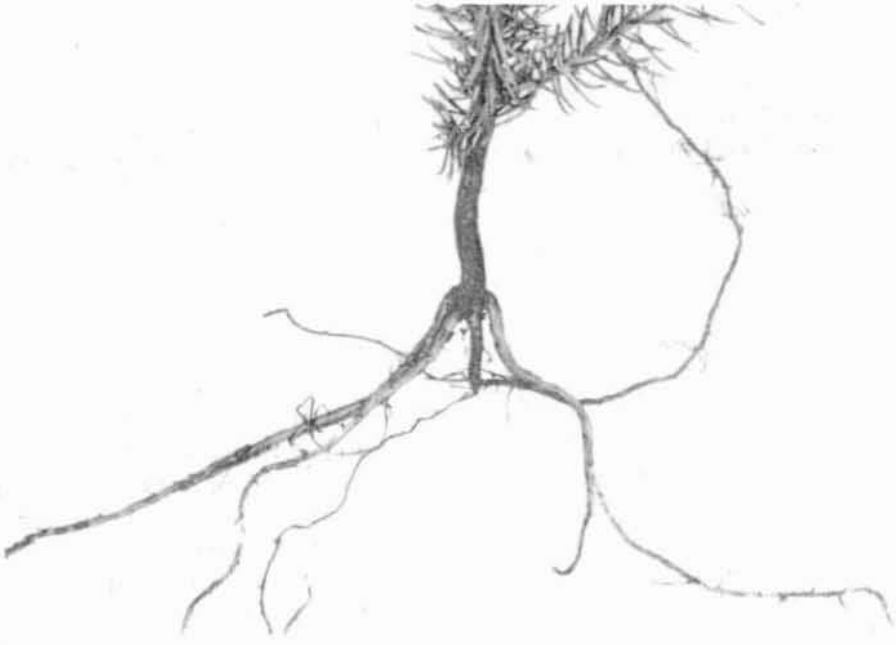

Figure 3A. Roots of a black spruce seedling damaged by Cylindrocladium root rot.

Figure 3B. Typical root damage caused by Cylindrocladium root rot.

Valsa Canker, *Valsa kunzei* Fr.

In 1974 an impact study plot was established at the Midhurst Nursery to study the effects of this canker on white spruce. The plot consists of five 1/10-acre (0.04-ha) subplots containing a total of 183 trees, of which 16.9% bore stem cankers. One tree had died. In the Maple District, a light infection persisted in a white spruce stand in East Gwillimbury Township. A light infection occurred in the Uxbridge headquarters tract in Uxbridge Township where trace stem mortality was evident.

Top-killing and Branch Mortality of Scots Pine

This condition, which appeared suddenly in Scots pine plantations east of a line between Hamilton and Penetang in 1973, did not show up again in 1974. As was expected, some tree parts still alive in 1973 died in 1974, but no new evidence of the condition was observed. The absence of new infections supports the earlier hypothesis that some unusual weather condition predisposed the trees to attack by the relatively weak pathogen *Cenangium ferruginosum* Fr. ex Fr. Fruiting of this fungus was abundant in 1974.

Table 11. Other forest diseases

Organism	Host(s)	Remarks
Botrytis cinerea Pers. ex Fr.	wS	associated with failure of leading buds of 3-0 stock to develop
Chaetophoma sp.	eC	several trees infected in Ops Twp, Lindsay District
Coleosporium asterum (Diet.) Syd.	jP	light on lower branches of 3% of trees in W. Gwillimbury Twp, Huronia District
Cylindrosporium spp.	bCh	high infection level in Flos Twp, Huronia District
Cytospora kunzei Sacc.	wS	one ornamental tree severely infected in Peterborough, Lindsay District
Cytospora spp.	bPo, nM	infections noted in Mara Twp, Huronia District and in Manvers Twp, Lindsay District

(continued)

Table 11. Other forest diseases (concluded)

Organism	Host(s)	Remarks
Diplodia pinea (Desm.) Kickx	rP	light infection on 10% of 3-0 stock in two beds in the Orono Nursery, Lindsay District
Diplodia spp.	wS	moderate infection on 5% of 2-0 stock in one bed in the Orono Nursery, Lindsay District
Endocronartium harknesii (J. P. Moore) Y. Hiratsuka	ScP	1-5% incidence; common in the Central Region
Gymnosporangium globosum Farl.	Haw	high infection level in Flos Twp, Huronia District, light in Beverly Twp, Cambridge District
Rhizosphaera kalkhofii Bubak	wS	moderate shoot mortality on several trees in Uxbridge Twp, Maple District

APPENDIX

CENTRAL REGION

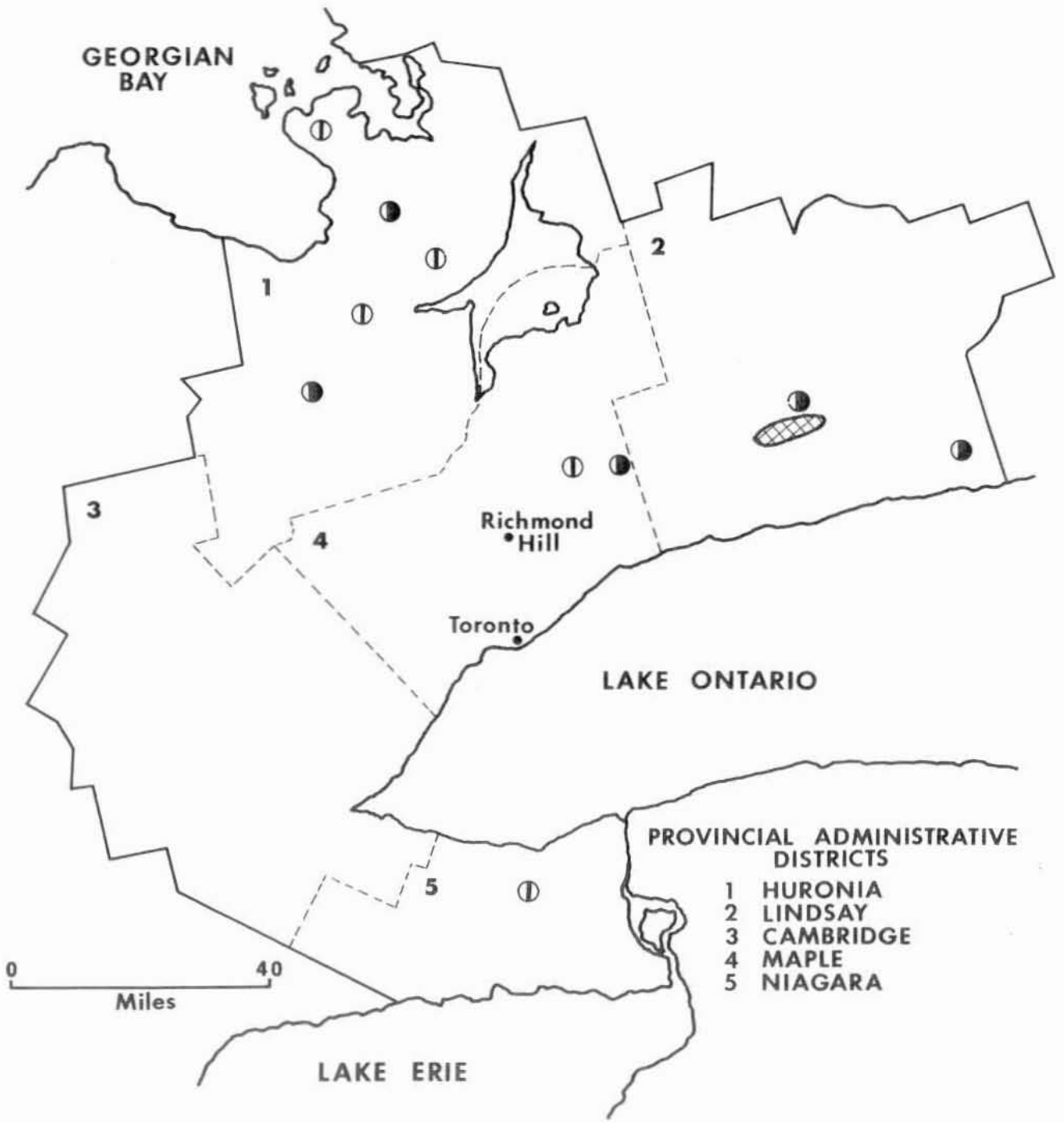

Figure A1. OAK LEAFTIER

Locations where infestations occurred in 1974

Light infestation . . . .

Medium infestation . . .

Heavy infestation . . .

CENTRAL REGION

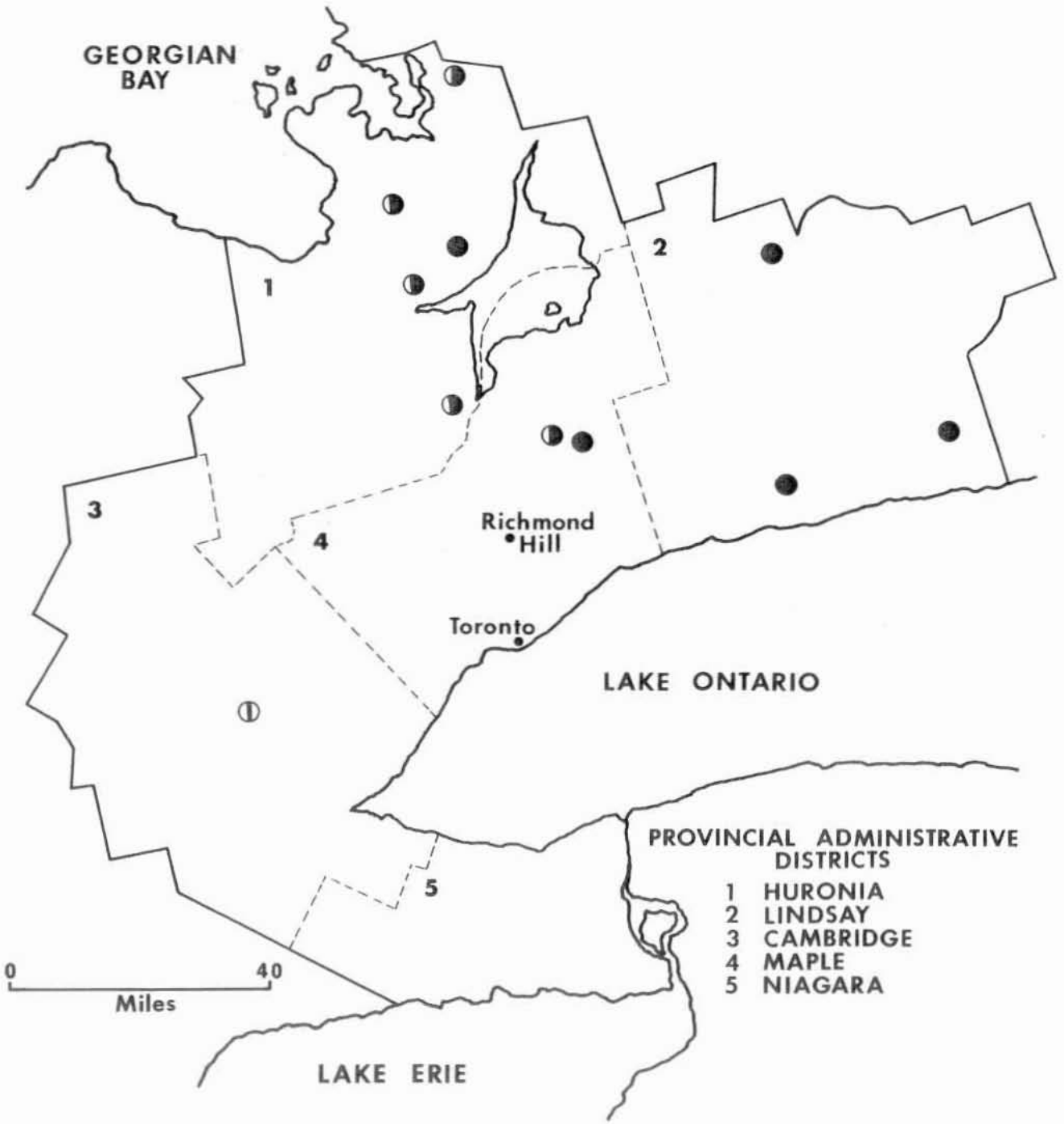

Figure A2. WHITE PINE WEEVIL

Locations where quantitative data were obtained in untreated areas in 1974

Light infestation . . . . . ◐

Medium infestation . . . . . ◑

Heavy infestation . . . . . ●

CENTRAL REGION

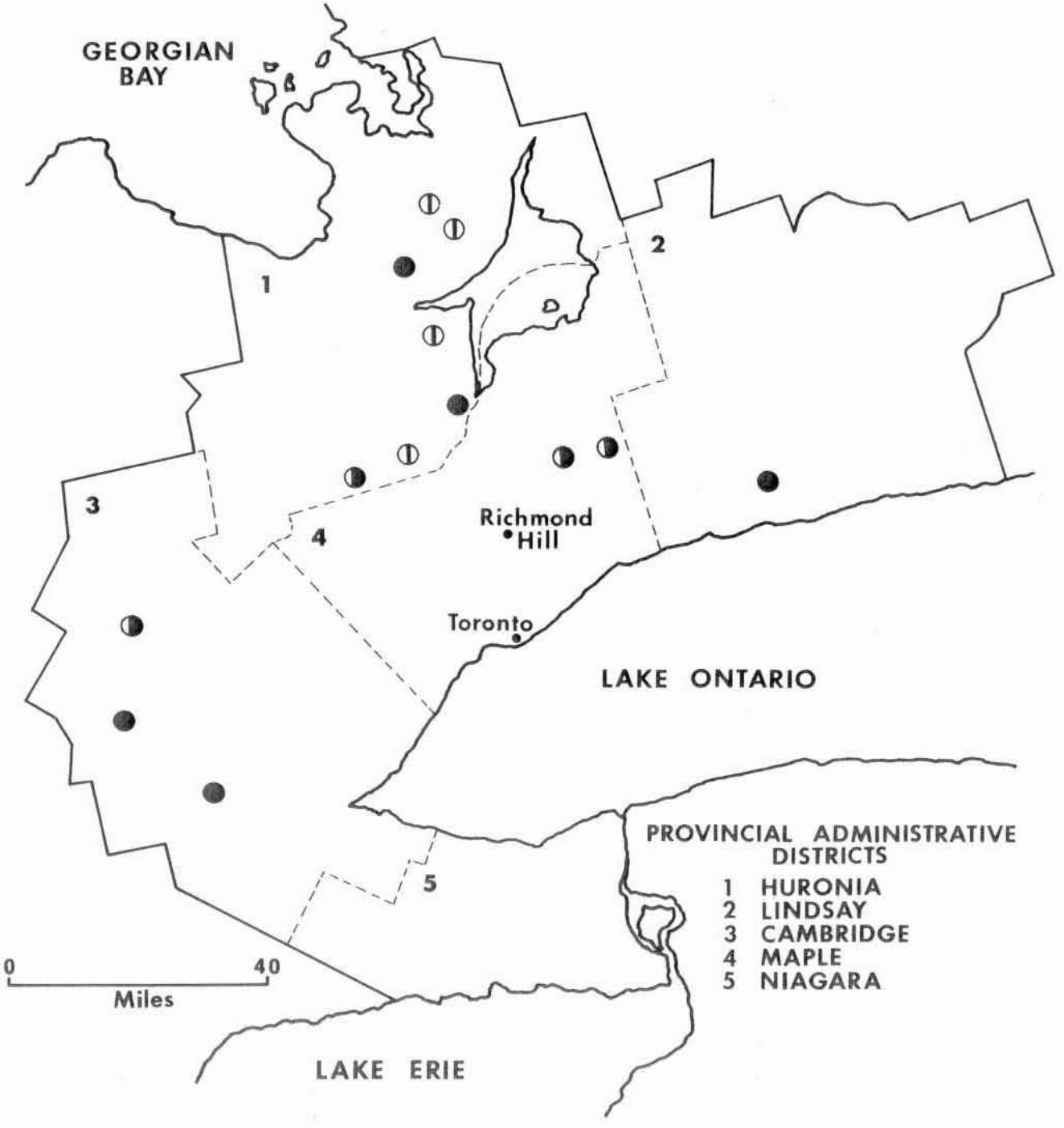

Figure A3. LARCH SAWFLY

Locations where infestations occurred in 1974

Light infestation . . . . ◐

Medium infestation . . . ◑

Heavy infestation . . . . ●