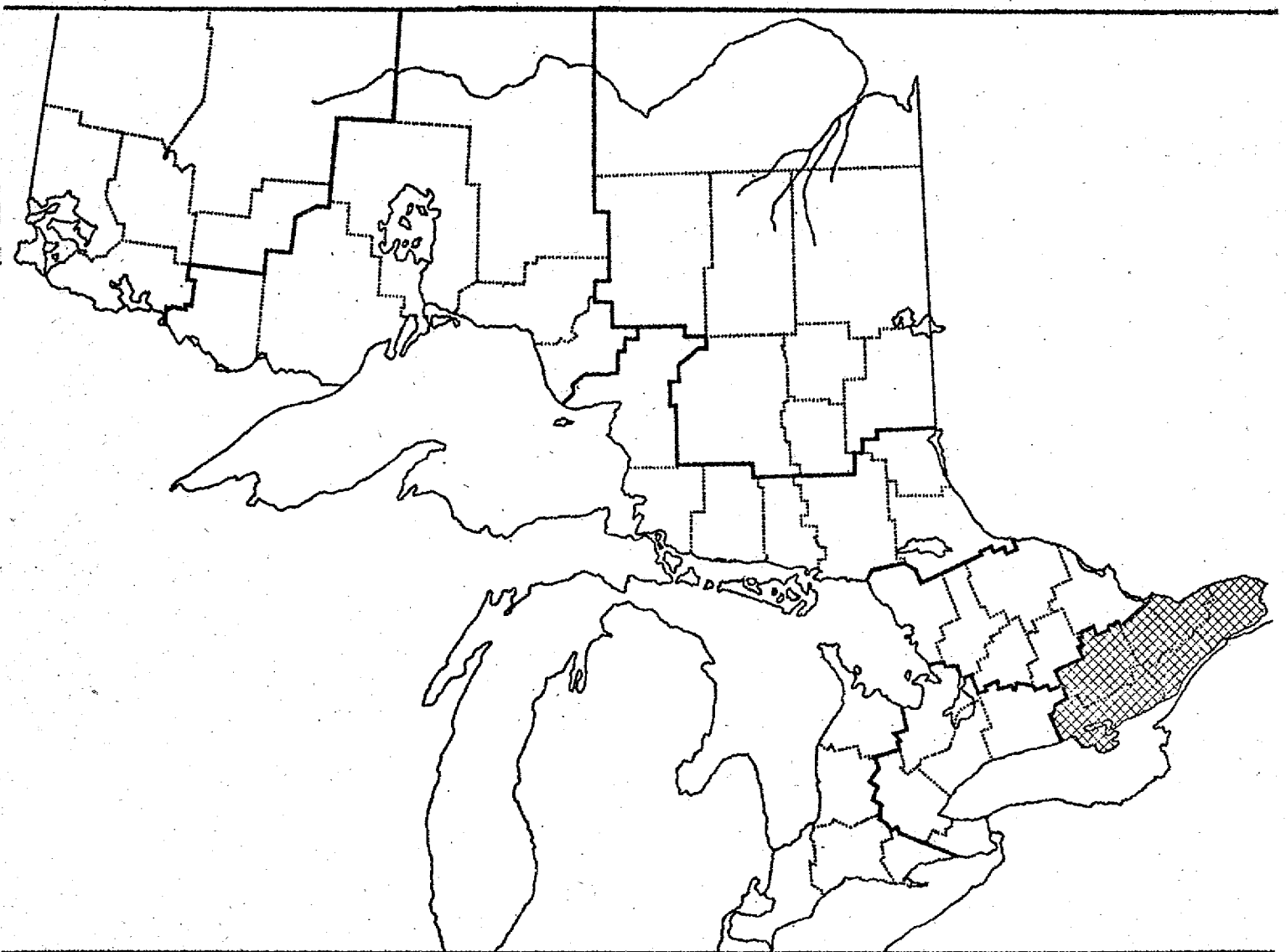


FOREST INSECT AND DISEASE SURVEYS IN THE EASTERN REGION OF ONTARIO, 1975

C. A. BARNES
CANADIAN FORESTRY SERVICE



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SAULT STE. MARIE, ONTARIO
CANADIAN FORESTRY SERVICE
DEPARTMENT OF THE ENVIRONMENT

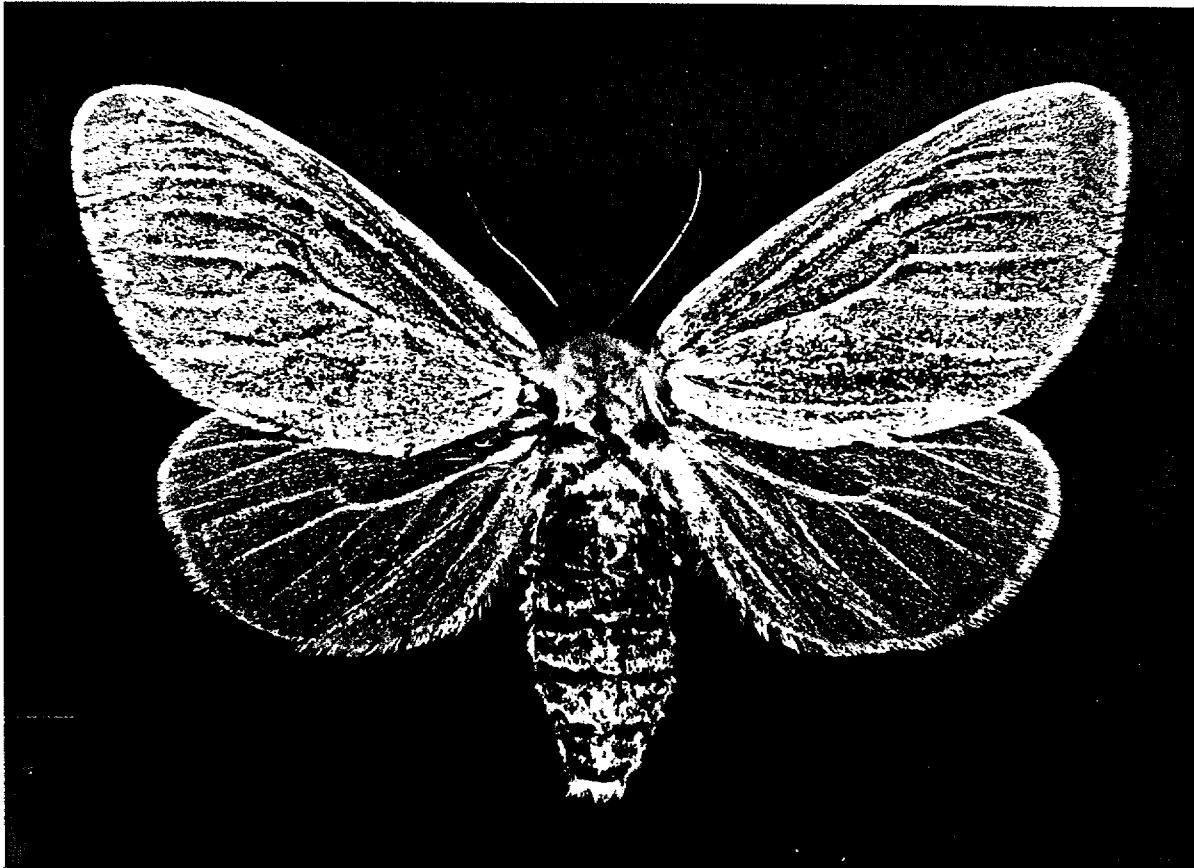
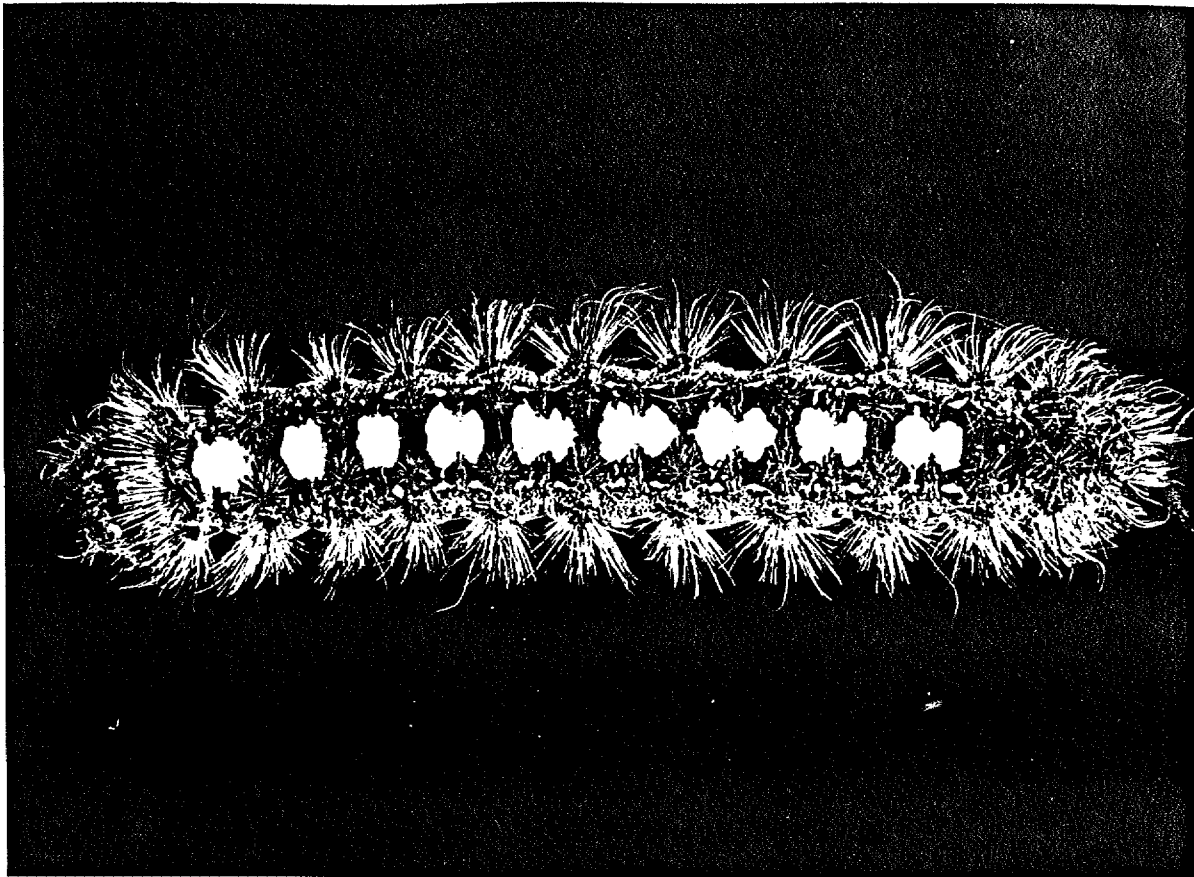
MARCH 1976

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ACKNOWLEDGMENTS

The excellent cooperation received from the Ontario Ministry of Natural Resources and the forest industry as a whole is gratefully acknowledged.



Frontispiece. Larva and adult of the satin moth, *Stilpnotia salicis* Linn., an introduced pest new to the Eastern Region.

SURVEY HIGHLIGHTS

Weather had an important influence on insect and disease conditions in 1975. An early spring followed by a hot, dry summer resulted in rapid insect development and the early appearance of insect damage. Symptoms of drought were common, but some tree diseases were less severe than usual.

The aerial application of nuclear polyhedrosis virus against the European pine sawfly proved particularly effective in a 308-acre (125-ha) stand of red pine, jack pine and Scots pine in Sandbanks Provincial Park. Forest damage by the spruce budworm (see Report O-X-250), forest tent caterpillar, oak leaf shredder and satin moth increased and smaller but important increases were recorded in numbers of jack pine budworm, oak leafminer, yellowheaded spruce sawfly and pitch nodule maker at many points. Damage by cedar leafminers was confined to small pockets of infestation at widely scattered locations.

A tip blight, *Phomopsis juniperovora* Hahn., caused considerable damage to shoots and branches of red juniper at many points near Kingston and in Prince Edward County. Surveys of Dutch elm disease showed higher rates of infection and mortality than in 1974. *Cylindrocladium* root rot was isolated from soil samples submitted from the Kemptville nursery. A special survey of white pine blister rust was carried out, and needle rusts of spruce and pine were found to be less common than usual.

C. A. Barnes,
Technician,
Eastern Region

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INSECTS

Cedar Leafminers, *Argyresthia canadensis* Free., *Argyresthia freyella* Wlshm., *Pulicalvaria gibsonella* (Kft.), *Pulicalvaria thujaella* (Kft.)

Although in recent years population levels of *A. canadensis* and *P. thujaella* on eastern white cedar (*Thuja occidentalis* L.) have declined, localized infestations caused extensive reddening of foliage near Belleville, Brighton and Kingston in Napanee District, near Hopetown, Lanark District and at scattered locations along Highway 7, Tweed District. Light infestations recurred at many points elsewhere in the Region. The leafminers *A. freyella* and *P. gibsonella* caused moderate to heavy leaf damage of red juniper (*Juniperus virginiana* L.) at many locations in Prince Edward County. Most notable infestations occurred near the Picton municipal airport and at several points in Hallowell, Athol, Sophiasburgh and South Marysburgh townships.

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 report by G. M. Howse et al. (Report O-X-250). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1975 and gives infestation forecasts for the province in 1976.

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

For the third consecutive year heavy infestations occurred in approximately 100 sq. miles (250 km²) of forested land. Red oak (*Quercus rubra* L.) was severely defoliated in two widely separated infestations, one near Tower Lake in Lanark District and the other near Bells Corners, Ottawa District. Moderate infestations persisted over a large area, from Denbigh Township, Tweed District, easterly to the Ottawa River (see Appendix, Fig. A1). Light to moderate infestations were also noted near Perth, Lanark District, and near Kemptville, Ottawa District. The number of adults captured at a light trap in Olden Township was lower than in previous years, suggesting that less damage may be expected in 1976. Only 625 moths were captured, compared with ca 1000 in 1974 and 1600 in 1973.

Birch Leafminer, *Fenusa pusilla* (Lep.)

Once again severe foliage browning on white birch (*Betula papyrifera* Marsh.), wire birch (*Betula populifolia* Marsh.) and ornamental birch was widespread (Table 1). Heavy infestations persisted

of larvae. Many control operations were carried out by personnel of the Ontario Ministry of Natural Resources and by private landowners, using virus or chemical pesticides. In most instances control measures were relatively successful; however, sprays were not applied to the Marmora infestation in time for effective control. Many other infestations were observed, notably in Matilda Township, Cornwall District, Elizabethtown Township, Brockville District, and near Elm Tree, Tweed District. Small pockets of infestation were common at many points throughout the Region.

Table 5. Summary of redheaded pine sawfly colony counts in two districts in 1975 (based on the examination of 100 red pine trees at each location)

Location (Twp)	Avg DBH (in.) ^a	Total no. of colonies 1975
Tweed District		
Madoc	1	22
Marmora	2	208
Olden	1	23
Lanark District		
Dalhousie	1	7
Lanark	1	18

^a 1 in. = 2.54 cm

Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl.

Colonies of larvae were again found on red pine and jack pine (*Pinus banksiana* Lamb.) trees at widely separated points in the Lanark, Brockville, Tweed, and Ottawa districts (Table 6). The most noteworthy infestations occurred in small red pine plantations north of Lanark and on jack pine along Highway 41, south of Denbigh, Tweed District. However, defoliation did not exceed 20% of last year's foliage at either location. Small numbers of colonies were observed at scattered points within the National Capital Commission Green Belt Forest, Ottawa District, and near Kemptville, Brockville District.

Table 6. Summary of red pine sawfly colony counts in three districts in 1975 (based on the examination of 100 red pine trees at each location)

Location (Twp)	Avg DBH (in.) ^a	Total no. of colonies
Lanark District		
Lanark	3	13
Dalhousie	3	11
Tweed District		
Abinger	1	7
Ottawa District		
Nepean	2	8

^a 1 in. = 2.54 cm

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross

Small, localized, heavy infestations were noted in the Brockville, Tweed and Lanark districts (Table 7). Infestations were confined to hedgerows, windbreaks and small plantations near Kemptville and Merrickville, Brockville District, near Manotick, Ottawa District, near Lanark, Lanark District and south of Denbigh in Abinger Township, Tweed District. In some instances defoliation of 1974 foliage was over 90%.

Table 7. Summary of jack pine sawfly colony counts in four districts in 1975 (based on the examination of 100 red pine trees at each location)

Location (Twp)	Avg DBH (in.) ^a	Total no. of colonies
Lanark District		
Lanark	1	21
Ramsay	1	13
Ottawa District		
Oxford	1	131
Brockville District		
Wolford	3	107
Tweed District		
Abinger	1	17

^a 1 in. = 2.54 cm

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

In 1974, 308 acres (124.64 ha) of red pine, jack pine and Scots pine (*Pinus sylvestris* L.) located in Sandbanks Provincial Park, Prince Edward County, were severely defoliated by this insect. During the winter of 1974-1975 plans were formulated by the Napanee District Office of the Ontario Ministry of Natural Resources and the Great Lakes Forest Research Centre to spray the infested plantations, using nuclear polyhedrosis virus supplied by the Insect Pathology Research Institute, Sault Ste. Marie. Although virus has been used in control for a number of years, this was the first operational trial to control a sizeable infestation using aircraft. The formulation was applied at the rate of 1 g of virus per gal (4.5 l) of water per acre (0.4 ha). This was applied shortly after larval emergence. The postspray followup showed that within 3 days 90% of the colonies were infected, and within 10 days an exhaustive search failed to locate any living larvae (Fig. 2). A check area located a short distance from the spray zone showed normal larval development.

Surveys to determine distribution of the released European parasite, *Lophyoplectus luteator* Thunb., were carried out at several locations. Positive recoveries were made in Prince Edward County and from the National Capital Commission Green Belt Forest near Ottawa. These represent an advance of approximately 150 miles (240 km) over 1974.

As in 1974, infestations were found at widely separated locations. Light to moderate defoliation was observed near Kaladar, Tweed District and at scattered points within the National Capital Commission Green Belt Forest near Ottawa. Small numbers of colonies were noted near Kingston. Larval colony counts based on the examination of 100 red pine and 100 Scots pine trees were carried out at two widely separated locations. There were 28 colonies on red pine in Hallowell Township and 19 on red pine and 8 on Scots pine in Nepean Township.

Pitch Nodule Maker, *Petrova albicapitana* (Busck.)

This insect feeds inside pitch masses on jack pine, generally at the base of lateral or terminal shoots. Two damaging infestations were found, one in a jack pine plantation in the Torbolton Forest, Ottawa District, the other in the Burnt Land Tract near Almonte, Lanark District. Of 100 jack pine trees examined at each location, 62% of the trees were infested in the Torbolton Forest and 37% in the Burnt Land Tract.

White Pine Weevil, *Pissodes strobi* Peck

This insect which attacks the leading shoots of host trees caused varying degrees of damage at many points. Attack was most severe in Hungerford Township, Tweed District and in Wolford and Augusta townships, Brockville District (Table 8). Moderate damage was noted on white pine (*Pinus strobus* L.) underplantings in Dalhousie Township, Lanark District, and a light infestation was noted on jack pine trees in the Torbolton Forest, Ottawa District. Some control measures were carried out using Methoxychlor in combination with the clipping of infested shoots.

Table 8. Summary of damage by the white pine weevil in four districts in 1975

Location (Twp)	Tree species	Avg DBH (in.) ^a	Trees weeviled (%)
Ottawa District Torbolton	jP	1	3
Tweed District Hungerford	wP	2	36
Brockville District Augusta	wP	2	32
Wolford	wP	3	18
Lanark District Lanark	wP	1	11

^a 1 in. = 2.54 cm

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Several moderate to heavy infestations were observed in the Cornwall District. The most noteworthy infestation occurred in the Prescott and Russell County Forest, where occasional stands of European larch (*Larix decidua* Mill.) were severely defoliated. Pockets of moderate to heavy infestation were common in the Limerick Forest, Brockville District, near Ottawa, Ottawa District and at scattered locations in the Tweed and Napanee districts. Light infestations were common at many other points.

Satin Moth, *Stilpnotia salicis* Linn.

This defoliating insect (see Frontispiece), which appears to favor exotic poplars, silver poplar, (*Populus alba* L.) and Lombardy poplar (*Populus nigra* var. *italica* Muench.), caused severe defoliation at several locations in the southeastern part of the Region (see Appendix, Fig. A3). Heavy infestations continued as they have for the past 3 years near Cornwall and Lancaster. However, heavy infestations can now be reported near Ottawa as well as near Casselman and Williamstown in the Cornwall District. All three of the last-named locations represent new distributional records for this introduced pest.

Table 9. Other forest insects

Insect	Host(s)	Remarks
<i>Alsophila pometaria</i> (Harr.)	Ba, wE	scattered light to moderate infestations in Ottawa and Lanark districts and low levels elsewhere in the Region
<i>Anacampsis innocuella</i> Zell.	1A	understory trees moderately infested near Ashby Lake, Tweed District
<i>Anisota finlaysoni</i> Riotte	b0	scattered colonies on roadside trees near Kingston and Gananoque, Napanee District
<i>Archips argyrospilus</i> (Wlk.)	wB	small numbers on understory trees near Bells Corners, Ottawa District
<i>Archips cerasivoranus</i> (Fitch)	ecCh, cP1	occasional heavy infestations on roadside trees at many points in the Region
<i>Argyresthia laricella</i> Kft.	eL	moderate twig damage on occasional trees in Limerick Forest, Brockville District
<i>Bucculatrix ainsliella</i> Murt.	r0	population decline on roadside trees near Howe Island, Napanee District; leaf skeletonizing much lower in 1975 than in 1974

Table 9. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Caliroa</i> sp.	r0	slug sawfly infestations extremely heavy on ornamental trees in the village of Kemptville, Brockville District
<i>Cenopis pettitana</i> Rob.	Ba, sM	larvae common at many points throughout the Region but only at trace levels
<i>Choristoneura pinus pinus</i> Free.	jP	jack pine budworm caused light defoliation in Burnt Land Forest near Almonte, Lanark District and near Constance Bay, Ottawa District
<i>Coleophora betulivora</i> McD.	wB	small numbers of casebearer on open-growing and under-story trees near Bells Corners and Fitzroy Park, Ottawa District
<i>Coleophora laricella</i> Hbn.	tL, cL	light infestation on plantation trees in Limerick Forest, Brockville District and near Marmora, Tweed District
<i>Conophthorus banksianae</i> McPherson	jP	light damage by tip beetle in Torbolton Forest, Ottawa District
<i>Datana integerrima</i> G. & R.	bWa	small hedgerow heavily infested on outskirts of Smiths Falls, Lanark District; scattered colonies on occasional trees near Winchester, Cornwall District
<i>Eacles imperialis pini</i> Michener	rJ	small numbers on occasional trees near Picton municipal airport, Napanee District

Table 9. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Erannis tiliaria</i> Harr.	Ba, wE	Populations of this insect are increasing at many points in the Region. The most notable increase occurred near Bells Corners, Ottawa District and near Lanark, Lanark District
<i>Lithocolletis hamadryadella</i> Clem.	rO	Pockets of heavy infestations were observed at several locations. The highest numbers occurred near Denbigh, Tweed District, near Kingston and Gananoque, Napanee District and to a lesser degree at many points in the Brockville and Cornwall districts.
<i>Neodiprion virginianus</i> complex	jP	small numbers of colonies near Hopetown, Lanark District
<i>Nymphalis antiopa</i> L.	wE & orna- mentals	numerous colonies observed on white elm and Siberian elm (<i>Ulmus pumila</i> L.) near Kemptville, Brighton and Fitzroy Park
<i>Phenacaspis pinifoliae</i> (Fitch)	ScP	scale unusually heavy on needles of this host at Sandbanks Provincial Park, Napanee District
<i>Phratora purpurea purpurea</i> Brown	tA	high numbers of this leaf beetle on understory trees near Sharbot Lake, Tweed District
<i>Pikonema alaskensis</i> Roh.	wS	Heavy infestations were observed at several points in Ottawa, Brockville and Lanark districts; most areas were sprayed.

Table 9. Other forest insects (concluded)

Insect	Host(s)	Remarks
<i>Pissodes approximatus</i> Hopk.	wP	trees infected by blister rust heavily infested by the northern pine weevil near MacDonalds Corners, Lanark District
<i>Plagiodera versicolora</i> Laich	tA, Cpo	moderate infestations on occasional trees at two locations in Ottawa District
<i>Pristiphora geniculata</i> (Htg.)	eMo	Stock trees at Kemptville Nursery were heavily infested by this sawfly; the area was sprayed.
<i>Pulicalvaria laricis</i> Free.	eL	small numbers on plantation trees near Oxford Station, Brockville District
<i>Pyrrhalta luteola</i> (Mull.)	wE Siberian elm	heavy infestations with severe defoliation near Kemptville, Brockville District, and Lanark, Lanark District
<i>Sparganothis directana</i> Wlk.	ecCh	heavy infestations on field cherry in Burnt Land Forest near Almonte, Lanark District
<i>Zeiraphera canadensis</i> Mut. & Free.	wS	small numbers on hedgerow trees at Kemptville Nursery and in Lanark County Forest



Fig. 1. Unsightly webbing and defoliation of black ash caused by the fall webworm

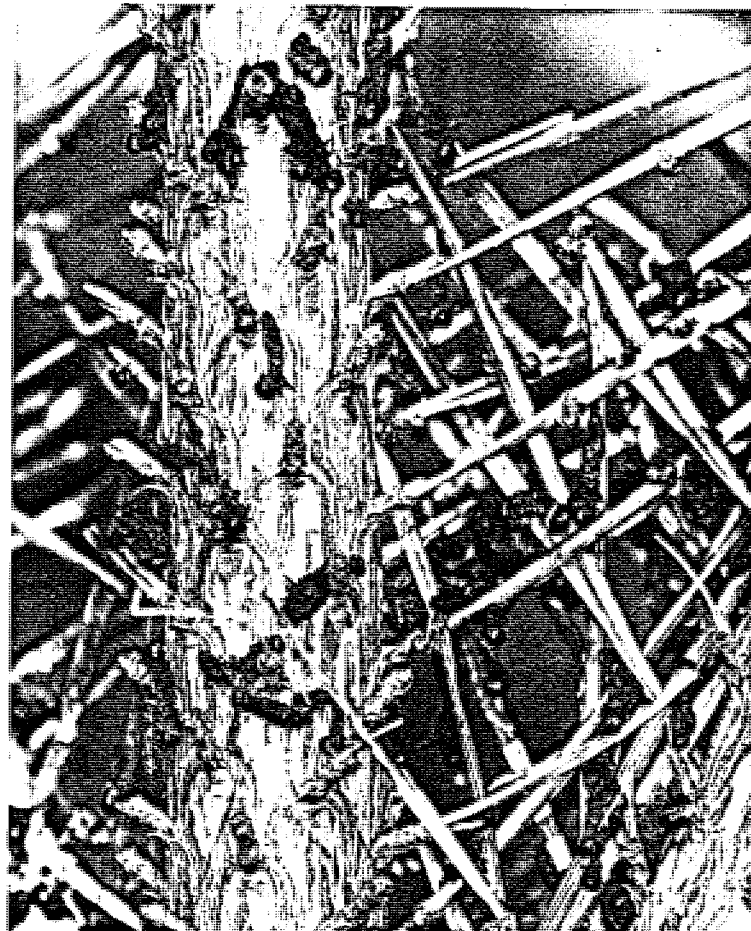


Fig. 2. Young larvae of the European pine sawfly killed by virus

TREE DISEASES

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

This root-rotting fungus occurs on many tree species; however, this report deals more specifically with damage to jack pine, Scots pine and white pine plantations at four locations in the Region. In Clarence and Cambridge townships, Cornwall District, Scots pine and white pine trees showed typical symptoms of the disease, and between 1% and 2% recent mortality was determined. In Dalhousie Township, white pine trees with discolored needles were examined. The presence of root rot was confirmed, but no recent mortality was observed. Jack pine trees in the Torbolton Forest, Ottawa District were also affected.

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

As in past years numerous new infections and considerable mortality of white elm trees were noted in the Region. There was a wide range (5%-57%) in the annual mortality rate (Table 10). Regional average mortality was 23.8% in 1974 and 23.5% in 1975; therefore, there was little change in numbers of trees killed. Municipalities and representatives of the Ontario Ministry of Transportation and Communications have been cutting and removing dead and infected elm for several years for reasons of safety and to improve the appearance of the landscape.

Table 10. Summary of current mortality caused by Dutch elm disease in seven plots in the Eastern Region in 1975

Location (Twp)	Healthy	Diseased	Annual mortality rate	
	trees 1975	trees 1975	1974	1975
Lanark District				
Lanark	24	5	22.5	6.5
North Sherbrooke	15	13	22.5	9.6
Montague	6	6	30.0	57.1
Cornwall District				
Lancaster	29	7	5.0	5.3
Ottawa District				
Osgoode	6	14	32.5	25.9
Napanee District				
Camden	13	10	30.0	17.8
Sophiasburgh	8	3	24.0	42.1

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

Eight juvenile white pine plantations were sampled as part of a white pine blister rust survey. The results obtained showed that the rust occurs in varying degrees of intensity throughout the Region (Table 11). The percentage of trees affected ranged from 0 in a plantation located near Bourget, Cornwall District to a high of 21.5 in Nepean Township, Ottawa District. Recent tree mortality was 4% or less in all instances. The regional averages for trees affected and tree mortality were 12.0% and 2.1%, respectively.

Table 11. Summary of white pine blister rust damage in eight locations in 1975 (counts based on the examination of 150 trees at each location)

Location (Twp)	Avg height of sample trees (ft) ^a	Living trees affected (%)	Recent tree mortality (%)
Cornwall District			
Clarence	9	0	0
Cambridge	18	10.0	4.0
Ottawa District			
Fitzroy	16	9.5	1.5
Nepean	12	21.5	1.5
Brockville District			
Augusta	14	18.5	2.2
Wolford	12	18.0	3.0
Lanark District			
Dalhousie	7	3.8	1.5
Napanee District			
Murray	20	15.0	3.0

^a 1 ft = 30.48 cm

Cedar Apple Rust, *Gymnosporangium juniperi-virginianae* Schw.

As in 1974 this gall rust caused moderate damage to branches of red juniper along highways 401 and 33 near Bath and Kingston and at many additional points in Prince Edward County, Napanee District. The abundance of red juniper in an area with many untended apple (the alternate host) orchards creates conditions favorable to high damage levels.

A Tip Blight of Red Juniper, *Phomopsis juniperovora* Hahn.

For the past 2 years this disease of red juniper has caused severe browning of needles and some tree mortality in many parts of Prince Edward County. The heaviest damage occurred near Black River, Mountain View and the Picton airport and on small clumps of trees near Belleville, Kingston and Bath, Napanee District. Light to moderate damage levels occurred near Sandbanks and Outlet provincial parks and at several locations in Hallowell and South and North Marysburgh townships. Other parasitic fungi associated with *Phomopsis* blight were: *Sclerophoma pithya* (Thuem.) Hoehn., *Didymascella thujina* (Durand) Maire, *Cytospora* sp. and *Libertella* sp.

Nursery Diseases

Emphasis in 1975 was given to a survey of southern Ontario nurseries for *Cylindrocladium* root rot (*Cylindrocladium floridanum* Sob. and Seymour), a disease that has created major problems in nurseries in the United States. This disease was observed for the first time in Ontario in the Midhurst nursery in 1974. With a random start, soil samples were collected systematically and submitted to the Great Lakes Forest Research Centre for analysis. Some of the samples taken from the Kemptville nursery contained *C. floridanum*.

In 1975, red pine and white pine seedlings in Compartment 11 were seriously damaged by *Fusarium solani* (Mart.) Appel & Wr. Approximately half of the trees were killed. In Compartment 19 the disease caused heavy needle chlorosis and spotty tree mortality was noted. Other organisms cultured in association with *F. solani* were *Alternaria* sp. and *Aureobasidium pullulans* (dBy.) Arn.

Silver maple (*Acer saccharinum* L.) leaves were damaged by Anthracnose. There also was a possibility of a nutritional deficiency. Moderate leaf damage also occurred in several rows of white ash (*Fraxinus americana* L.).

The leaf spot *Phyllosticta sorbi* Westend caused moderate damage in a few rows of European mountain ash (*Sorbus aucuparia* L.).

Abiotic Damage

Owing primarily to the heavy protective cover of snow followed by a continuously warm spring, damage caused by winter drying and frost did not occur in 1975. Early leaf fall attributed to drought was common, but heavy rainfalls during late September and early October brought water tables back to normal and no adverse effects are expected in 1976. As in past years salt damage was evident on roadside trees, particularly along hills and curves of travelled roads where salt was most heavily applied. No appreciable damage was observed by wind, hail or ice.

Table 12. Other forest diseases

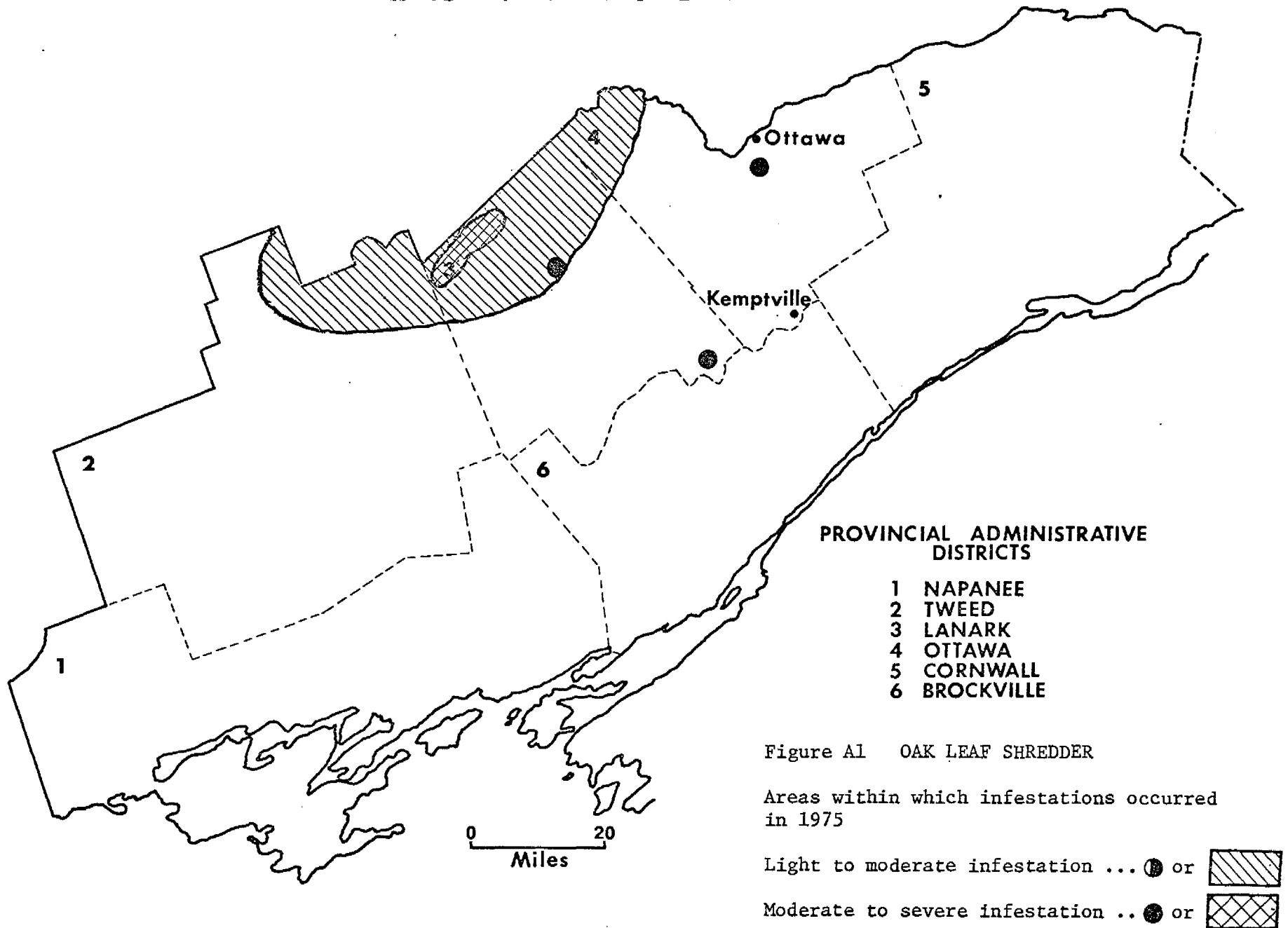
Organism	Host(s)	Remarks
<i>Ciborinia whetzellii</i> (Seaver) Seaver Ink spot of aspen	tA	Moderate defoliation by ink spot occurred along Sun Road, LaRose Forest; damage was negligible elsewhere in the Region.
<i>Coleosporium asterum</i> (Diet.) Syd. Needle rust	rP	low defoliation levels throughout the Region
<i>Cytospora chrysosperma</i> (Pers.) Fr. Canker	tA	small branches moderately damaged near Northbrook, Tweed District
<i>Cytospora populina</i> Roh. Canker	hybrid poplar	light to moderate damage on branches and stems of this host in an OMNR plantation near Fournier, Cornwall District; low levels of damage near North Augusta, Brockville District
<i>Dothichiza populea</i> Sacc. & Briard Dothichiza canker of poplar	hybrid poplar lPo	heavy damage levels throughout the Region on Lombardy poplar; light damage on hybrid poplar near North Augusta, Brockville District
<i>Cronartium quercuum</i> (Berk.) Miyabe ex Shirai Oak gall rust	ScP, jP	gall rust common on hedgerow Scots pine at Kemptville nursery, and on jack pine near Merrickville, Brockville District
<i>Gloeosporium aridum</i> Ell. & Holw. Anthracnose	wAs	leaf anthracnose common on this host near Tower Lake, Lanark District and near Fitzroy Provincial Park, Ottawa District
<i>Hypoxyylon mammatum</i> (Wahl.) Miller Hypoxyylon canker of poplar	tA	continues to cause stem cankers and tree mortality throughout the Region

Table 12. Other forest diseases (concluded)

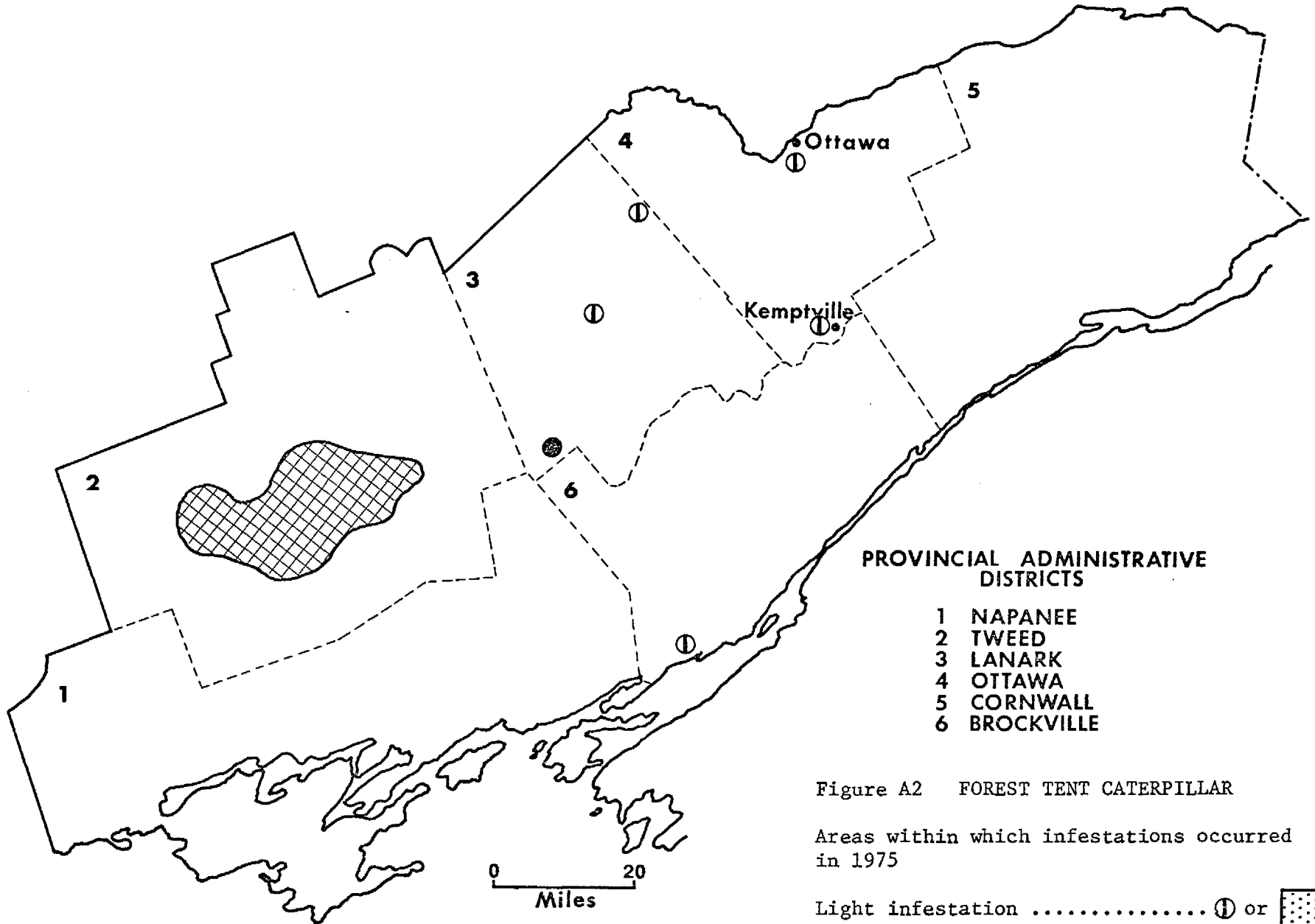
Organism	Host(s)	Remarks
<i>Marssonina</i> sp.	hybrid poplar	caused moderate damage to this host near North Augusta, Brockville District; not observed elsewhere
<i>Nectria cinnabarina</i> (Tode ex Fries) Fries Nectria canker	sM	heavy cankering on small branches of ornamental trees near Kemptville
<i>Phoma pinicola</i> (Zopf) Sacc. Canker	wP	common on dead trees and in association with damage caused by blister rust near Brighton, Napanee District and near Ottawa, Ottawa District; elsewhere in the Region negligible damage observed
<i>Pollaccia radiosa</i> (Lib.) Bald. & Cif. Leaf and twig blight	tA	understory trees heavily damaged by leaf and twig blight at many points throughout the Region; most serious infection observed near Bourget, Cornwall District
Rodent damage	various	damage much lower in 1975 than in 1974
Semimature tissue needle blight	wP	not observed in 1975

APPENDIX

EASTERN REGION



EASTERN REGION





PROVINCIAL ADMINISTRATIVE DISTRICTS

- 1 NAPANEE
- 2 TWEED
- 3 LANARK
- 4 OTTAWA
- 5 CORNWALL
- 6 BROCKVILLE

Figure A2 FOREST TENT CATERPILLAR

Areas within which infestations occurred in 1975

Light infestation ① or 

Moderate to severe infestation .. ● or 

EASTERN REGION

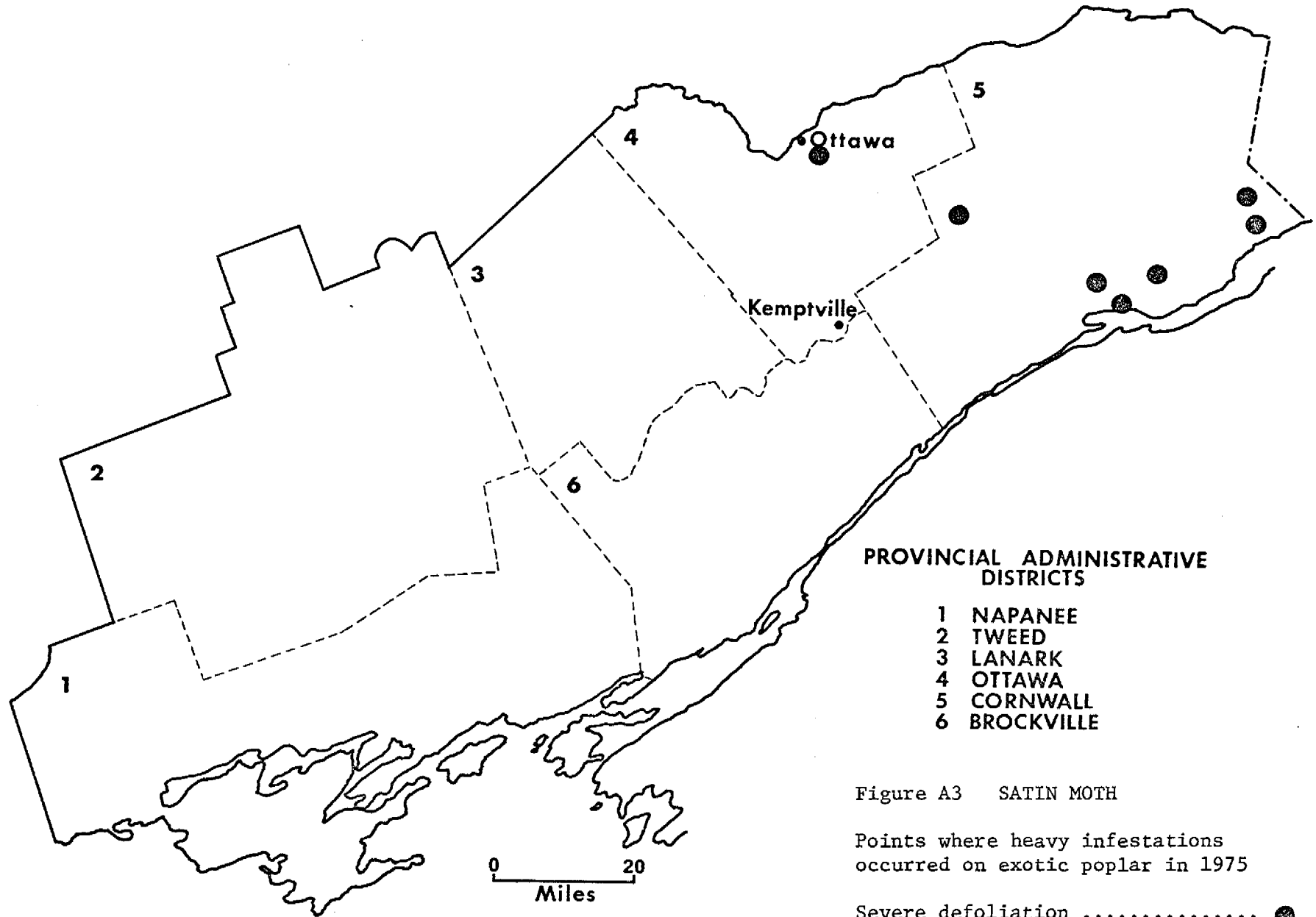


Figure A3 SATIN MOTH

Points where heavy infestations occurred on exotic poplar in 1975

Severe defoliation