

RESULTS OF FOREST INSECT AND  
DISEASE SURVEYS IN THE  
EASTERN REGION OF ONTARIO,  
1985

(FOREST DISTRICTS: NAPANEE, TWEED, CARLETON PLACE,  
CORNWALL AND BROCKVILLE)

W.A. INGRAM

GREAT LAKES FORESTRY CENTRE  
CANADIAN FORESTRY SERVICE  
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## SURVEY HIGHLIGHTS

The following text reflects the climatological, insect and disease conditions experienced in the Eastern Region of Ontario in 1985.

Gypsy moth populations continued to increase rapidly throughout the Region. The area of moderate-to-severe defoliation rose from 1,450 ha in 1981 to 246,342 ha in 1985. Sawfly populations continued to build throughout the Region and several control operations with both chemicals and virus were undertaken to reduce insect populations in young pine stands. Pine false webworm continued to gain in distribution but population levels encountered this year did not necessitate any control measures. Maples across the work area that were still suffering from the drought of 1983 experienced increased damage by both the maple leaf cutter and the maple trumpet skeletonizer in 1985.

Scleroderris canker was again of primary concern in the Region and both aerial and ground observations and numerous stand evaluations were carried out to determine the status of this serious pathogen. Fortunately, no areas of infection have been recorded to date. Fomes root rot remains active in the Region in both Limerick and LaRose forests in the older pine plantings.

Special surveys of young conifer stands were continued this year with special attention being directed to red pine plantations and related pest problems.

Surveys continued for the pinewood nematode which was recovered from dying pine in Limerick Forest in 1984.

Two more permanent acid rain plots were set up in the Region in 1985 as part of the Acid Rain National Early Warning System (ARNEWS) established across Canada by the Canadian Forestry Service.

As in previous years, pests in this report are categorized as follows:

### *Major Insects or Diseases*

capable of causing serious injury to or death of living trees or shrubs

### *Minor Insects or Diseases*

capable of causing sporadic or localized injury but not usually a serious threat to living trees or shrubs

### *Other Forest Insect/Diseases (Tables)*

These tables provide information on two types of pest:

Frontispiece



Pine false webworm, *Acantholyda erythrocephala* (L.)



Gypsy moth, *Lymantria dispar* (L.), adults laying eggs

- 1) those which are of minor importance and have not been known to cause serious damage to forest trees,
- 2) those which are capable of causing serious damage but, because of low populations or for other reasons, did not cause serious damage in 1984.

The author would like to express his appreciation to personnel of the Ontario Ministry of Natural Resources and Parks Canada in the Eastern Region for their continuing support and assistance.

W.A. Ingram

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## INSECTS

### Major Insects

#### Pine False Webworm, *Acantholyda erythrocephala* (L.)

Population levels remained low at most plantations examined. Throughout the areas in which populations have been building for the past two years in Oxford (on Rideau) and South Gower townships, Brockville District, and Rideau Township, Carleton Place District, an increase in distribution was recorded but generally populations remained low. Although the insect fed on both Scots pine (*Pinus sylvestris* L.) and white pine (*P. strobus* L.) in the above-mentioned three townships, by far the heaviest damage was recorded on red pine (*P. resinosa* Ait.) (see Frontispiece). In a 4-ha plantation of 2-m trees in Fitzroy Township, Carleton Place District, 17 of the 150 trees examined lost 5-100% of their old foliage.

#### Cedar Leafminer Complex, *Argyresthia thuiella* (Pack.) and *Pulicalvaria thujaella* (Kft.)

Eastern white cedar (*Thuja occidentalis* L.) was again defoliated by this complex of leafminers in the windbreaks at the G. Howard Ferguson Forest Station in Oxford (on Rideau) Township in Brockville District. Fall applications of the insecticide Cygon 2E, applied with an orchard sprayer, resulted in effective control of the insect.

Throughout Seymour and Percy townships in the Napanee District individual trees in larger stands sustained light damage. Trace levels of damage could be found throughout much of the Napanee District.

#### Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Populations continued to decline throughout the Region in 1985. Light defoliation persisted in two immature white spruce (*Picea glauca* [Moench] Voss) plantations, one in Cambridge Township in Cornwall District and the other in Gloucester Township in Carleton Place District. White spruce windbreaks at the G. Howard Ferguson Forest Station in Oxford (on Rideau) Township in Brockville District suffered 20-30% current defoliation. Good control was achieved with the insecticide Malathion applied with a mist blower. Subsequent egg surveys were negative and consequently little defoliation is expected in 1986.

Results of damage surveys, population sampling and egg-mass counts of the spruce budworm will be published with those of other regions at a later date in a report devoted specifically to this insect. The report will provide a complete description and analysis of developments in the spruce budworm situation in Ontario in 1985, and will give infestations forecasts for the province for 1986.

Larch Casebearer, *Coleophora laricella* (Hbn.)

The larval feeding of this insect has increased in the Brockville and Carleton Place districts over the past two years (Table 1). In the remainder of the Region defoliation fluctuated between 1% and 15% in larger stands in wetter areas ranging from 2 to 30 ha in size. The heaviest area of defoliation was recorded in the Ashton area in Carleton Place District where a 3-ha stand of tamarack (*Larix laricina* [Du Roi] K. Koch) was completely defoliated.

Table 1. Summary of larch casebearer larval counts recorded for the past two years in areas of heavy defoliation.

Area	Stand size (ha)	DBH (cm)	Larvae per 45-cm branch tip <sup>a</sup>	
			1984	1985
<u>Carleton Place District</u>				
Rideau Twp	35	12.5	14.5	23.0
<u>Brockville District</u>				
Oxford (on Rideau) Twp	10	17.5	2.9	18.0
Elizabethtown Twp	20	22.5	7.8	32.0

<sup>a</sup> based on the average of four 45-cm branch tips from each of four co-dominant trees at each location.

Maple Trumpet Skeletonizer, *Epinotia aceriella* (Clem.)

Population levels and distribution were both on the increase in 1985.

Heavy defoliation (75% to 100%) was recorded at a number of locations in the Region (Fig. 1). In Cornwall District a 3-ha stand of sugar maple (*Acer saccharum* Marsh.) in Alfred Township and a 10-ha stand of the same species in Williamsburgh Township sustained heavy damage for the second consecutive year. In Marmora Township in Tweed District similar damage was recorded in a 15-ha stand for the second consecutive year. In Oxford (on Rideau) Township in Brockville District and in the northern part of Elmsley Township in Carleton Place District heavy defoliation was recorded in several pockets from 3 to 10 ha in size. The most widespread damage was observed in Napanee District, where pockets of heavy defoliation ranging from 5 to 30 ha in size were recorded throughout Rawdon, Seymour, Brighton and Sidney townships.

# EASTERN REGION

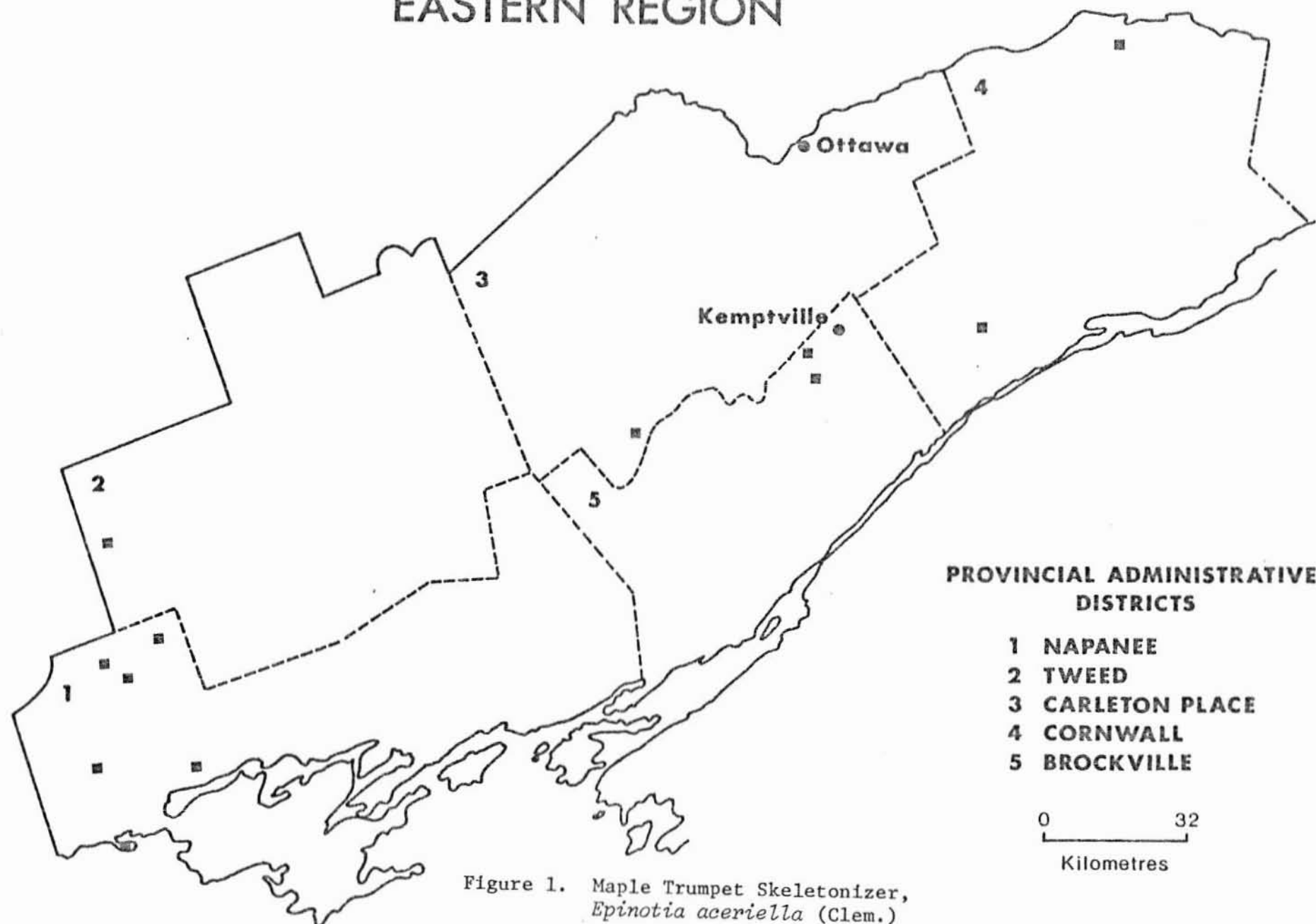


Figure 1. Maple Trumpet Skeletonizer,  
*Epinotia aceriella* (Clem.)  
Areas of moderate-to-severe  
defoliation in 1985 . . . ■

This included a 20-ha stand of mixed sugar maple and red oak (*Quercus rubra* L.) in Presqu'ile Provincial Park where heavy defoliation was observed on the sugar maple and light defoliation on the red oak.

Trace-to-light damage was encountered in most sugar maple stands throughout the remainder of the Region.

Fall Webworm, *Hyphantria cunea* (Dru.)

Population levels of this unsightly web-spinning insect continue to increase in the Region. Low-lying areas of black ash (*Fraxinus nigra* Marsh.), white elm (*Ulmus americana* L.) and red maple (*Acer rubrum* L.) are most commonly affected.

In Cornwall District, in Hawkesbury and Kenyon townships, a total of 18 ha suffered complete defoliation. In the Brockville District pockets of complete defoliation ranging from 3 to 11 ha in size occurred throughout a 26-ha stand in the Spencerville area in Edwardsburgh Township. In Carleton Place District, a 20-ha area near Richmond, in Goulbourn Township, again experienced heavy damage. In the Tweed District severe defoliation occurred within a combined area of some 20 ha in low-lying stands along Highway 7 in Marmora, Madoc and Elzevir townships and along Highway 41 in Abinger Township.

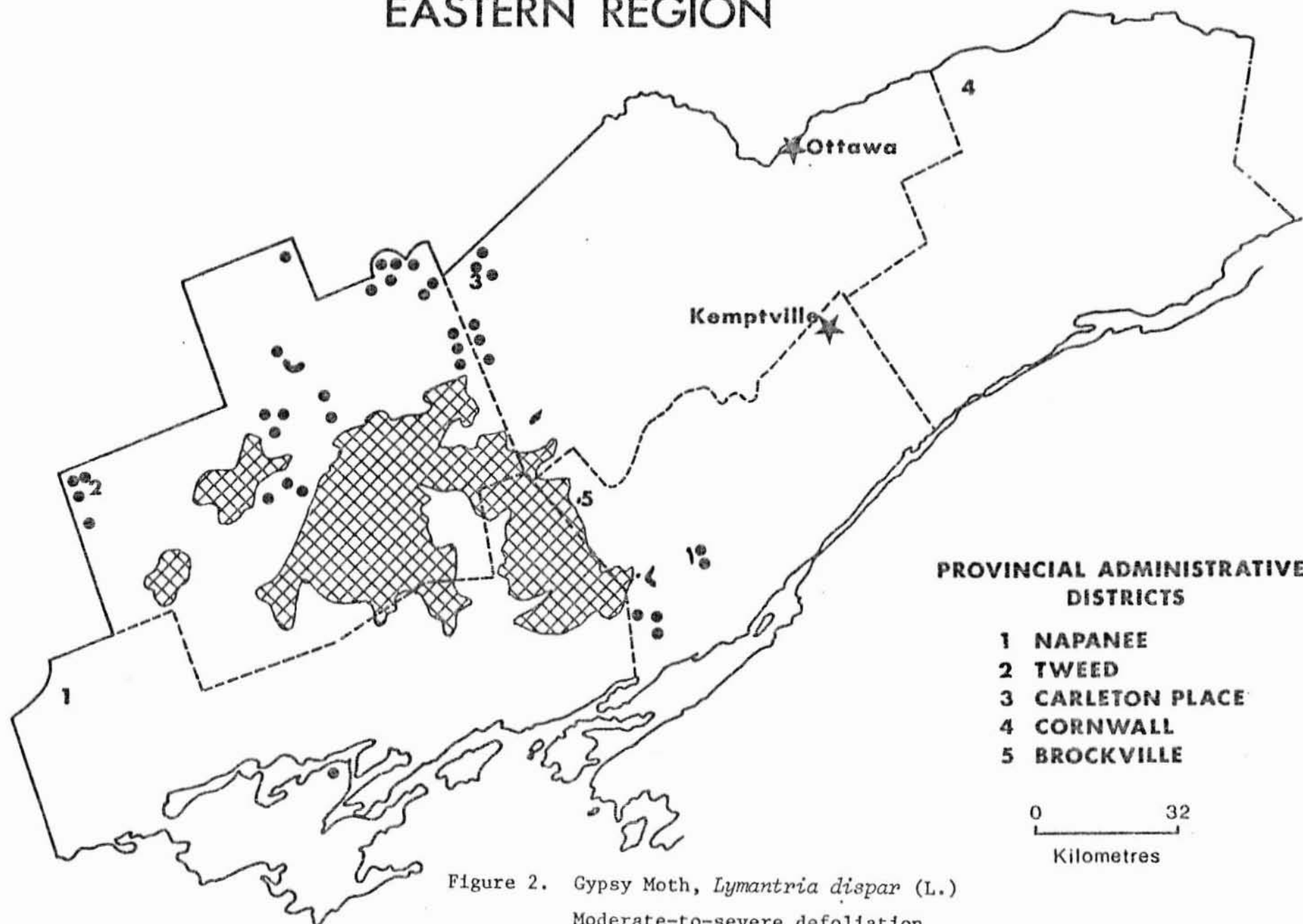
Gypsy Moth, *Lymantria dispar* (L.)

High population levels of this introduced pest (see Frontispiece) continue to cause extensive defoliation, primarily throughout the Tweed and Napanee districts. The area of moderate-to-severe defoliation tripled this year to 245,987 ha from a low of 1,450 ha in 1981 when the first damage was recorded (Table 2).

The timing of the insect hatch (7-18 May) placed the young larvae in an excellent position for dispersal on the wind with the follow-up wind from the Barrie tornado which blew through the area on Friday, 31 May. The young larvae suspended on silken threads appear to have been aerially dispersed much further north than had been anticipated and the normal eastward expansion did not materialize (Fig. 2).

The main body of the original infestation in the Kaladar area has joined with the infestation building in the Wolf Lake-Devil's Lake area just south of Highway 7 in the Sharbot Lake area to encompass some 208,559 ha of defoliation. The combined area now extends eastward to Westport and Jones Falls in the Brockville District, south into the Sydenham and Bellrock areas in the Napanee District, west into the Actinolite-Sulphide area, along Highway 41 south of Flinton, below Kashwakamak and Crotch lakes into the Snow Road Station area, all in the Tweed District. The only exception in this block is the lighter defoliation along Highway 38 from Oconto south into the Verona area of Napanee District.

# EASTERN REGION





## PROVINCIAL ADMINISTRATIVE DISTRICTS

- 1 NAPANEE
- 2 TWEED
- 3 CARLETON PLACE
- 4 CORNWALL
- 5 BROCKVILLE

0 32  
Kilometres

Figure 2. Gypsy Moth, *Lymantria dispar* (L.)  
Moderate-to-severe defoliation  
mapped in 1985

Smaller areas . . . . . ● or   
Main infestation . . . . . 

In Tweed District the infestation at Deloro in Marmora and Madoc townships has increased to 6,643 ha this year and crosses Highway 7 just south of Jarvis Lake. Just north of this area around Mount Moriah and Lingham Lake the infestation expanded to the north along the northeast side of Lingham Lake and eastward along the hydro line to the dam on Skootamatta Lake. North of these areas it expanded into the Skootamatta and Mazinaw lake areas. In the extreme northeast section in the Tweed District in North and South Canonto townships there is a series of pockets of infestation totalling 4,131 ha in patches of from 20 to 600 ha. Four additional pockets of defoliation were recorded on the east side of Tungamong Lake in Lake Township.

In Carleton Place District several pockets of defoliation were mapped in Dalhousie and Lavant townships on large hilltops with a heavy oak component (totalling 1,013 ha). The main arm of the infestation from Kaladar extended into the northern portion of the Christie Lake area and, along with a pocket of defoliation near Maberly along the Fall River, accounted for an additional 3,184 ha.

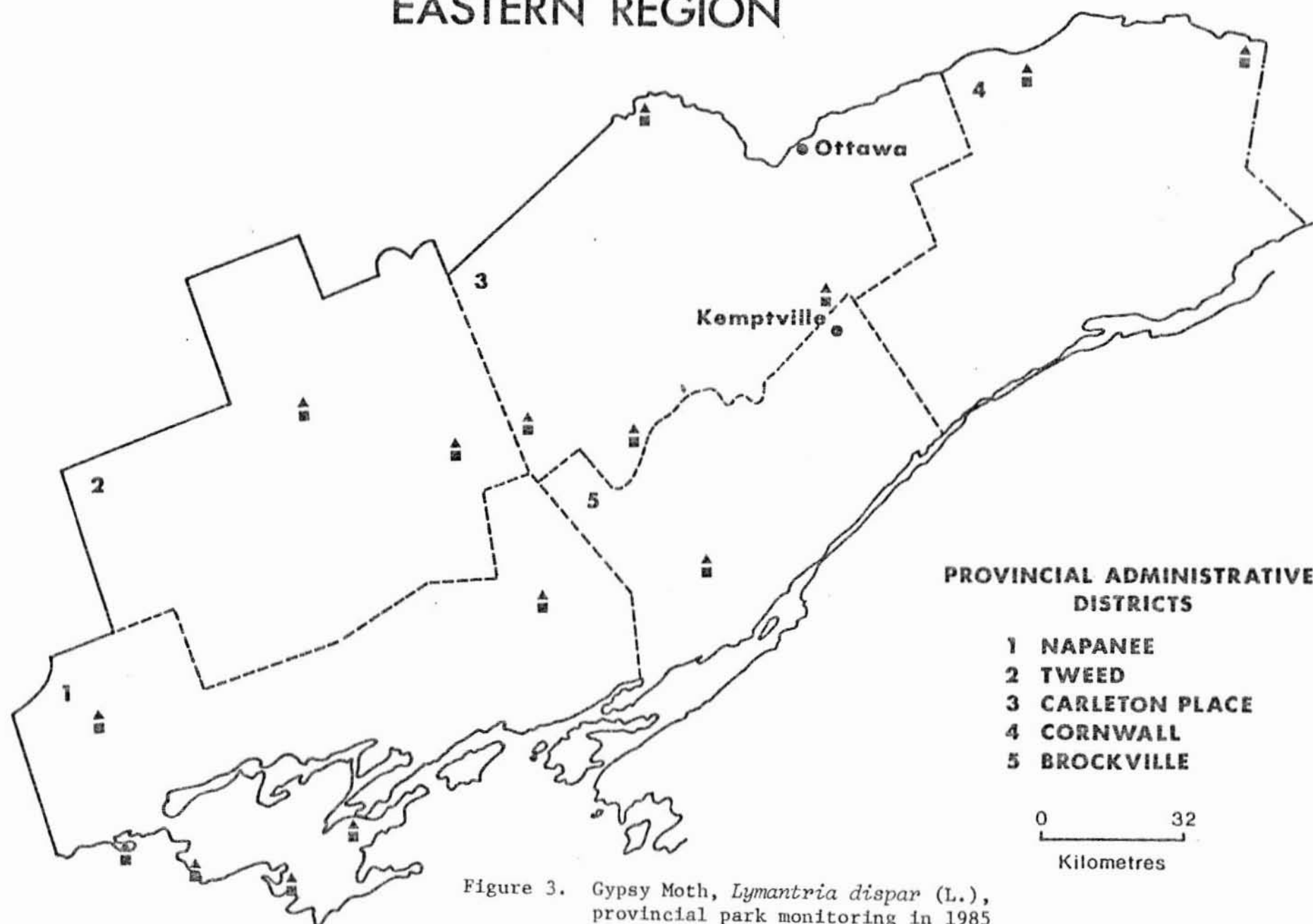
There were two new areas of defoliation totalling 243 ha in the Napanee District. The larger area was near Petworth in Portland Township and the smaller area was in Prince Edward County just south of the bridge crossing the Bay of Quinte at Deseronto.

In Brockville District 9,195 ha of defoliation from the main body extended into the Westport, Davis Lock and Keelerville areas and again into the Newboro, Indian and Sand Lake areas. South of the main area two pockets of defoliation were recorded near Marble Rock and another was recorded on the western tip of South Lake. To the east of the infestation in the Jones Falls-Morton area an additional 1,323 ha of defoliation were mapped and ground observations recorded a buildup around Donaldson Lake and east of Charleston Lake in the Blue Mountain area.

As in previous years all provincial parks in the Region were involved in a program in which larval populations were monitored with bur-lap traps, and adult activity was later monitored with pheromone traps randomly placed in the parks. The location of the parks monitored and the results of the survey are shown in Figure 3.

Low numbers of larvae and individual egg masses were detected throughout much of the remainder of the Region, particularly to the east of the present area of infestation in the Big Rideau Lake and Charleston Lake areas. There were noticeable areas of defoliation as well in Tor-bolton Township at Constance Bay in Carleton Place District and in the Conservation Authority property near Sterling in the Napanee District.

# EASTERN REGION



## PROVINCIAL ADMINISTRATIVE DISTRICTS

- 1 NAPANEE
- 2 TWEED
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- 4 CORNWALL
- 5 BROCKVILLE

0 32  
Kilometres

Figure 3. Gypsy Moth, *Lymantria dispar* (L.), provincial park monitoring in 1985

Adult pheromone trapping positive ▲

Burlap trapping of larva positive ■



Control measures against this insect were undertaken by many landowners in the Tweed area in 1985. It is estimated that between 2,000 and 3,000 ha of land were privately sprayed with either *Bacillus thuringiensis* (B.t.) or Sevin insecticide in June with fixed-wing aircraft. As well, the Conservation Authority at Sterling and the Parks Branch of the Ontario Ministry of Natural Resources (OMNR) conducted aerial sprays.

OMNR aerielly sprayed the 26-ha park at Silver Lake once and a combined area of 144 ha in Frontenac and Black Lake provincial parks twice to achieve acceptable control.

Egg-mass surveys were conducted in the Region in designated areas so that control measures against this insect in 1986 could be planned.

Table 2. Summary of damage by the gypsy moth in the Eastern Region from 1983 to 1985.

District	Moderate-to-severe defoliation (ha)		
	1983	1984	1985
Tweed	38,179	69,262	172,232
Napanee	2,772	10,000	58,326
Brockville	-	1,143	11,232
Carleton Place	-	219	4,197
TOTAL	40,951	80,624	245,987

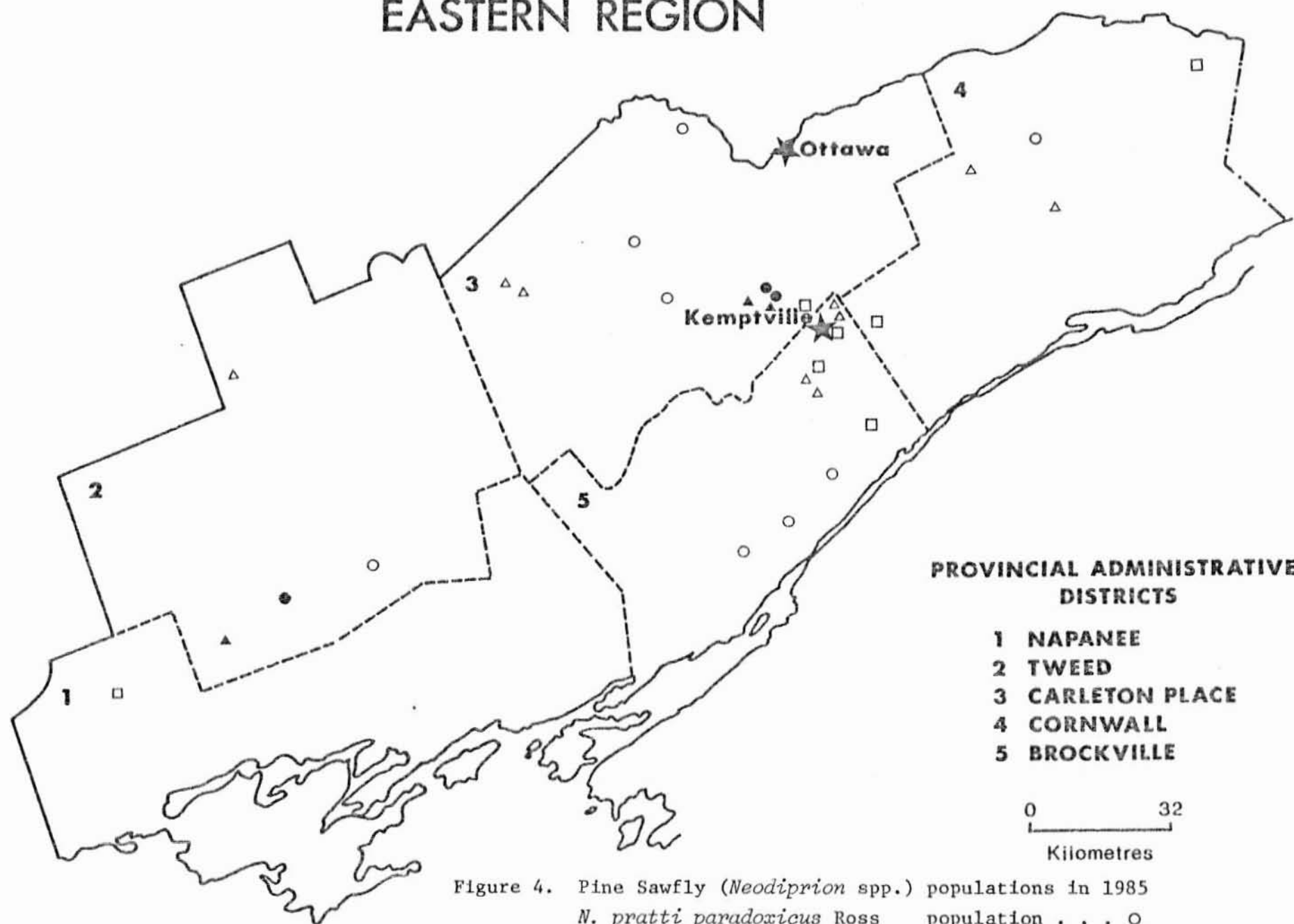
#### Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

The general buildup of populations of this destructive pest (see photo page) which began in 1983, continued in 1985. Throughout the Region low populations could be found in most young pine stands.

As a result of high populations in specific plantations a number of control operations were carried out in Carleton Place, Brockville and Tweed districts. Unlike last year, no chemical controls were anticipated and all sprays were done with the Lecontvirus (Fig. 4). Results of the Lecontvirus applications were varied and in one instance in Carleton Place District a followup spray of Malathion was necessary to achieve the desired foliar protection.



# EASTERN REGION



## PROVINCIAL ADMINISTRATIVE DISTRICTS

- 1 NAPANEE
- 2 TWEED
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- 4 CORNWALL
- 5 BROCKVILLE

0 32  
Kilometres

Figure 4. Pine Sawfly (*Neodiprion* spp.) populations in 1985

<i>N. pratti paradoxicus</i> Ross	population . . .	○
	control . . . . .	●
<i>N. lecontei</i> (Fitch)	population . . .	△
	control . . . . .	▲
<i>N. sertifer</i> (Geoff.)	population . . .	□

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross

Populations continued to expand, particularly in the Carleton Place and Brockville districts. Complete loss of old foliage was recorded in a 10-ha jack pine (*Pinus banksiana* Lamb.) stand in Hungerford Township in Tweed District (see photo page). At this location, open-grown jack pine trees in a jack pine-eastern red cedar (*Juniperus virginiana* L.) stand were completely devoid of old foliage. As many as 30 colonies per tree were counted on the jack pine host and in three instances colonies were also apparent on the red cedar host but they had not fed much and were quite small.

Control was carried out on the late larval population both in the Hungerford Township plantation in Tweed District and in the Rideau Township plantation in Carleton Place District with the chemical spray Malathion (Fig. 4). Excellent results were achieved; no larvae were observed when the plantations were visited 2-4 days after treatment.

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

Population levels continue to expand in the Region; however, no control measures have been necessary to date (Fig. 4).

The heaviest populations were recorded in pine plantations throughout the Cornwall, Brockville and Carleton Place districts. In Rideau Township, Carleton Place District, a 5-ha plantation of 4-m Scots pine trees had as many as 18 colonies per tree. Also in Rideau Township, a 10-ha plantation of 4-m red pine trees had 8% of the trees affected, with an average of four colonies per tree.

Maple Leafcutter, *Paraclemensia acerifoliella* (Fitch)

The population buildup which began in 1984 continued in 1985 with moderate-to-severe defoliation recorded frequently throughout the Region (Fig. 5). In Tweed District, aerial mapping revealed an area of defoliation totalling 480 ha in Marmora Township, with smaller pockets up to 20 ha in size in Huntingdon, Effingham and Clarendon townships. In Carleton Place District a 5-ha area in Lavant Township and three areas in the northern part of Burgess Township ranging in size from 2 to 30 ha suffered heavy damage. In Napanee District one small pocket of 3 ha suffered heavy damage. The area of light damage which occurred in 1984 in the Athens and Mallorytown areas in the Brockville District intensified in 1985, forming four pockets of heavy defoliation ranging from 10 to 30 ha in size. Unlike last year, this insect could be found at trace levels anywhere in the Region.

# EASTERN REGION

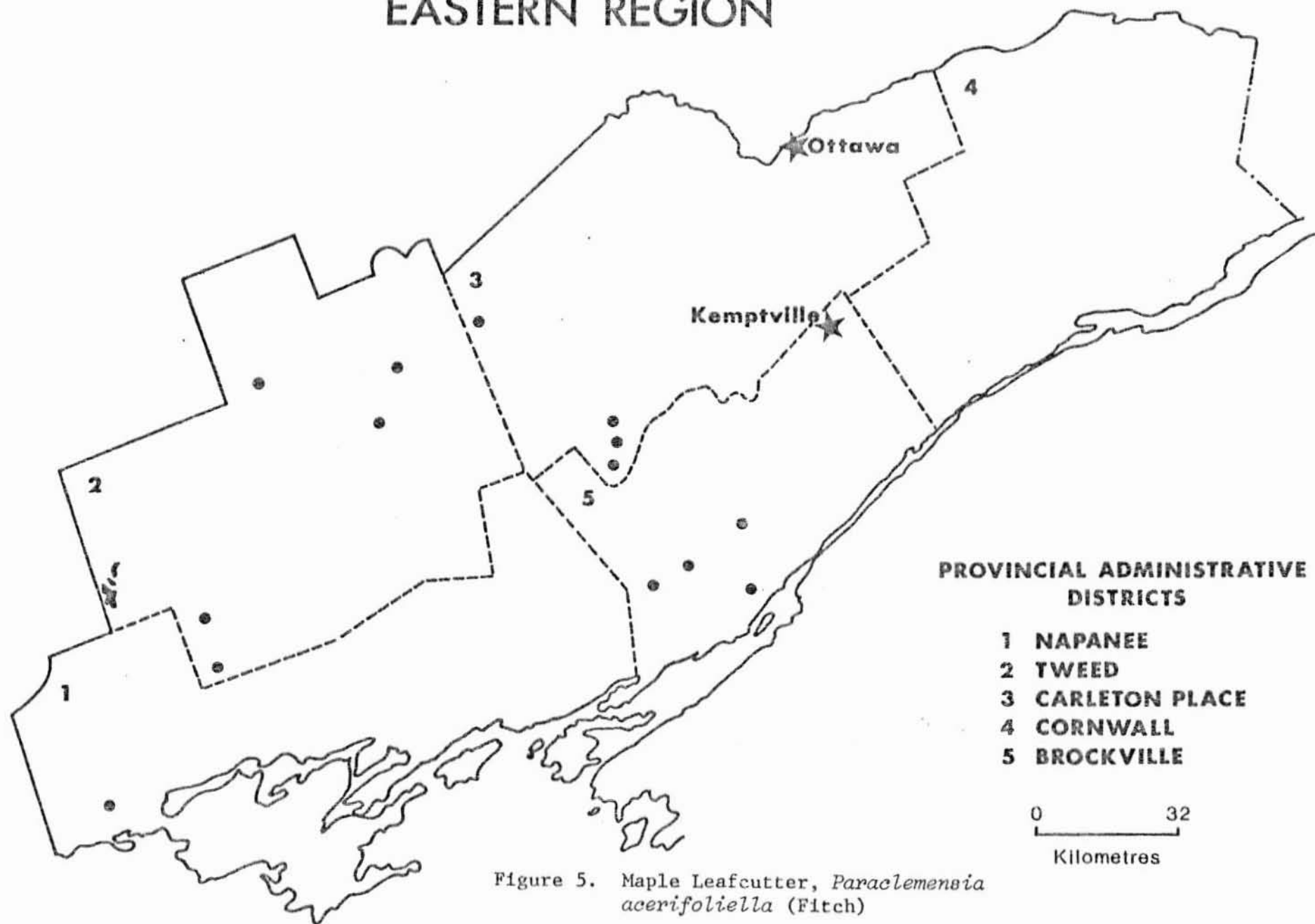


Figure 5. Maple Leafcutter, *Paraclemensia acerifoliella* (Fitch)

Areas of moderate-to-severe  
defoliation in 1985

• or

### Minor Insects

Oak Slug Sawfly, *Caliroa obsoleta* (Nort.) and *C. fasciata* (Nort.)

Widespread defoliation, ranging from light-to-moderate in forest situations to complete on ornamental trees, was observed in 1985.

In Ramsay Township in Carleton Place District a stand of 27 white oak (*Quercus alba* L.) along Highway 7 suffered complete defoliation, as did a patch of 13 red oak near Mallorytown in Front of Yonge Township in Brockville District.

Trace populations were recorded on all oaks examined throughout the remainder of the Region.

Satin Moth, *Leucoma salicis* (L.)

This introduced pest tends to be very cyclic in nature; 1985 proved to be one of the years in which it could be found commonly throughout its known range. Defoliation was first reported in 1972 in Cornwall District along the borders with Quebec and New York State; since then, the insect has been reported as far west as Belleville in the Napanee District and as far to the northwest as Cedar Hill in Pakenham Township in the Carleton Place District.

Defoliation is confined mainly to silver poplar (*Populus alba* L.) used as shade trees or windbreaks and, in many instances, the trees were completely stripped. At one location near Westbrook in the Napanee District, a pocket of silver poplar and weeping willow (*Salix babylonica* L.) was entirely stripped of foliage.

Bruce Spanworm, *Operophtera bruceata* (Hlst.)

Heavy defoliation was recorded over a 20-ha stand of sugar maple near Cedar Hill in Pakenham Township in Carleton Place District. At this location, defoliation ranged from 5% to 80% on 15- to 30-cm sugar maple trees in a sugar bush that was under tap. Understory trees and ground vegetation as well as regeneration was severely or completely defoliated in most instances.

Table 3. Other forest insects.

Insect	Host(s)	Remarks
<i>Aphrophora cribrata</i> (Wlk.) Pine spittlebug	jP, scP	low levels of damage recorded in a 5-ha jack pine stand in Rideau Township in Carleton Place District and in a 0.5-ha Scots pine windbreak in Seymour Township, Napanee District
<i>Archips cerasivoranas</i> (Fitch) Uglynest caterpillar	pin cherry	pockets of heavy damage along old abandoned railroad track in Huntingdon Twp
<i>Arge pectoralis</i> (Leach) Birch sawfly	wB	higher numbers than usual; complete defoliation recorded in both Rear of Leeds, Rear of Lansdowne and Oxford (on Rideau) twps
<i>Argyrotaenia pinatubana</i> (Kft.) Pine tube moth	wP	low population levels in Charleston Lake Provincial Park and in the Blue Mountain area of Charleston Lake
<i>Bucculatrix ainsliella</i> Murt. Oak skeletonizer	rO	heavy defoliation over a 2-ha stand along Hwy 2 in Front of Yonge Township, Brockville District
<i>Cenopsis acerivorana</i> MacK. Maple leafroller	sM	damage confined to small 1-ha patches of heavy defoliation in Darling, Lavant and Ramsay twps, Carleton Place District
<i>Chrysomela mainensis mainensis</i> Bech. Alder leaf beetle	alder	complete defoliation over a total of 1 ha along railroad tracks in Huntingdon Twp, Tweed District
<i>Chrysomela</i> sp. Leaf beetle	bPo	Heavy damage was recorded in the northern portions of Tweed and Carleton Place districts, and in Madoc and Rawdon twps in the Tweed and Napanee districts

(cont'd)

Table 3. Other forest insects (cont'd).

Insect	Host(s)	Remarks
<i>Coleophora ulmifoliella</i> McD. Elm casebearer	wE	single trees heavily defoliated in the northern part of Burgess Twp in Carleton Place District and Front of Yonge Twp in Brockville District; up to six casebearers per leaf observed at the location in Brockville District
<i>Croesus latitarsus</i> Nort. Dusky birch sawfly	wB	light defoliation common in Rear of Leeds and Lansdowne twps in Brockville District and Fitzroy Twp, Carleton Place District
<i>Dasychira plagiata</i> (Wlk.) Northern pine tussock moth	WS, wP	low population levels recorded on white spruce in Lavant Twp, Carleton Place District and on white pine in Cambridge Twp, Carleton Place District
<i>Datana ministra</i> (Dru.) Yellownecked caterpillar	wE, W	heavy defoliation of individual trees in Cornwall and Brockville districts
<i>Diprion similis</i> (Htg.) Introduced pine sawfly	scP, rP	2-3% defoliation recorded in a number of pine plantations from East Hawkesbury Twp in Cornwall District west to Anglesea Twp, Tweed District
<i>Ecdytolopha insiticiiana</i> Zell. Locust twig borer	honey locust	locust twig borer heavy on small clump of locust over a 0.5-ha area in Kaladar Twp, Tweed District
<i>Exoteleia pinifoliella</i> (Cham.) Pine needleminer	jP	low damage levels on eight ornamental trees along roadway in south Plantagenet Twp, Cornwall District
Gelechiidae	sM	leaf skeletonizer with distinct silken pads on upper surface of the leaf caused heavy damage sporadically in Brockville and Napanee districts

(cont'd)

Table 3. Other forest insects (cont'd).

Insect	Host(s)	Remarks
<i>Gilpinia frutetorum</i> (F.) Nursery pine sawfly	scP	low population levels on ornamental trees in South Nation Provincial Park, Cornwall District
<i>Gonioctena americana</i> (Schaeef.) American aspen beetle	tA	Heavy defoliation was recorded on individual trees up to 10 m tall over a 2-ha area in Rideau Twp, Carleton Place District.
<i>Halysidota caryae</i> (Harr.) Hickory tussock moth	Ba, Bu	heavy defoliation of roadside trees in East Hawkesbury Twp, Cornwall District and Huntingdon Twp, Tweed District
<i>Ips pini</i> (Say) Pine engraver	rP	High populations were observed in harvested wood left in the bush and on adjacent dying pine trees in Ramsay and Clarence twps, Carleton Place District
<i>Malacosoma americanum</i> F. Eastern tent caterpillar	cherry	high populations recorded throughout the Region in areas up to 2 ha in size and on trees up to 12 m in height
<i>Malacosoma disstria</i> Hbn. Forest tent caterpillar	tA	Populations increased over previous years in both Carleton Place and Tweed districts; however, no serious damage has been observed to date.
<i>Messa nana</i> (Klug) Early birch leaf edgeminer	wB	low populations recorded on roadside trees and stand edges throughout Carleton Place, Brockville and Napanee districts
<i>Messa populifoliella</i> (Town.) Poplar leafmining sawfly	tA	complete defoliation over a 5-ha stand in Huntingdon Twp, Tweed District, and on 12 trees in Seymour Twp, Napanee District

(cont'd)

Table 3. Other forest insects (cont'd).

Insect	Host(s)	Remarks
<i>Neodiprion nanulus nanulus</i> Schedl. Red pine sawfly	rP	light defoliation recorded on 2% of the trees in a 5-ha plantation in Darling Twp, Carleton Place District
<i>Nymphalis antiopa</i> (L.) Spiny elm caterpillar	wE	There were unusually high populations across the Region on clumps of 1 to 4 trees; populations in both Edwardsburgh and Augusta twps, Brockville District, had unusually high rates of parasitism.
<i>Petrova albicapitana</i> (Busck) Northern pitch twig moth	jP	Numbers have increased at all locations with concentrations of jack pine; the heaviest damage occurred in Montague Twp, Carleton Place District, where 46% of the trees were damaged and there were up to 14 nodules on some trees.
<i>Phyllonorycter restructella</i> (Braun) Beech leafminer	Be	heavy (80%) defoliation over a 0.5-ha patch of 18-m trees in Front of Yonge Twp, Brockville District
<i>Pikonema alaskensis</i> (Roh.) Yellowheaded spruce sawfly	wS	moderate (40%) defoliation over 2 ha within a 6-ha plantation in Bedford Twp, Napanee District
<i>Pissodes approximatus</i> Hopk. Northern pine weevil	scP, rP	mortality of 2% and 3% caused by this weevil on Scots pine in Kaladar Twp, Tweed District and on red pine in Torbolton Twp, Carleton Place District
<i>Pissodes strobi</i> (Peck) White pine weevil	rP, jP	1% to 3% damage in stands up to 2 m in height; 12% of the leaders damaged in a white pine plantation in Huntingdon Twp, Tweed District

(cont'd)



Table 3. Other forest insects (concl).

Insect	Host(s)	Remarks
<i>Pityogenes plagiatus</i> LeC. Bark beetle	rP	high numbers recorded in a pocket of 30 dead and dying 12m trees in Clarence Twp, Cornwall District
<i>Plagioderia versicolora</i> (Laich.) Imported willow leaf beetle	W	heavy damage recorded in Augusta Twp, Brockville District, over a 3-ha swampy area
<i>Pyrrhalta decora decora</i> (Say) Gray willow leaf beetle	alder	moderate damage by this skeletonizer over a 1.5-ha swampy area in Augusta Twp, Brockville District
<i>Pyrrhalta luteola</i> (Mull.) Elm leaf beetle	WE	heavy defoliation of three large white elm trees in front of high school in Richmond, Carleton Place District
<i>Rhychaenus rufipes</i> (Lec.) Willow flea weevil	W	high levels of defoliation in a low area of 0.5 ha in Edwardsburgh Twp, and a 1.5-ha area in Williamsburgh Twp, Brockville District
<i>Synanthedon pini</i> (Kell.) Pitch mass borer	wP	low levels of insect activity in pruning scars in acid rain plot in Huntingdon Twp, Tweed District
<i>Symmerista canicosta</i> Franci. Redhumped oakworm	wO	low population levels recorded on single roadside trees in Oxford (on Rideau) Twp, Brockville District
<i>Tetralopha aplastella</i> (Hlst.) Aspen webworm	tA	Populations persisted in both the Tweed and Napanee districts; 30-60% defoliation was recorded sporadically between the towns of Tweed and Campbellford in the western portion of the Region.
<i>Tetralopha asperatella</i> (Clem.) Maple webworm	rM, sM	Populations declined from last year; a single pocket of 10-15% defoliation was recorded over a 2-ha area in Front of Yonge Twp, Brockville District.



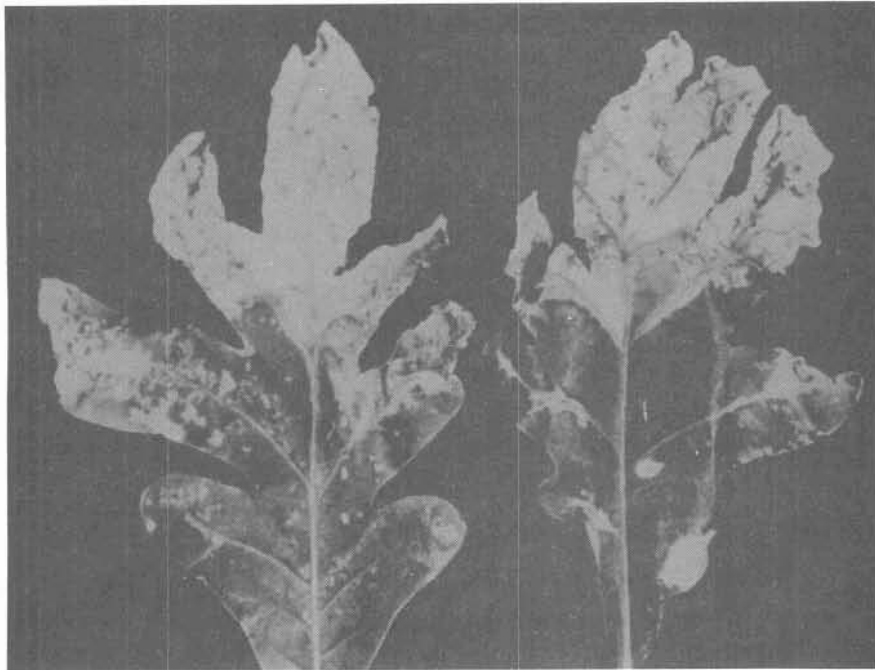
Redheaded pine sawfly,  
*Neodiprion lecontei* (Fitch)



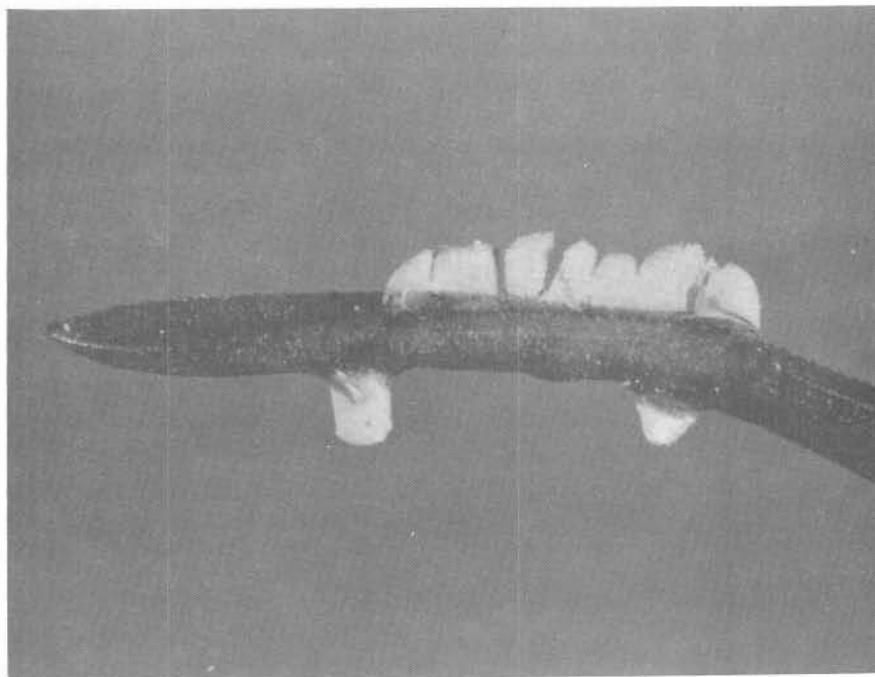
Jack pine sawfly, *N. pratti*  
*paradoxicus* Ross



Defoliation of a jack pine (*Pinus banksiana* Lamb.) stand  
by jack pine sawfly



Anthracnose, *Discula umbrinella* (Berk. & Broome) Morelet



Pine needle rust, *Coleosporium asterum* (Dietel) Sydow

## TREE DISEASES

### *Major Diseases*

Scleroderris Canker, *Ascochyta abietina* (Lagerb.) Schläpfer-Bernhard

Aerial as well as ground surveys designed to detect the presence of this organism were once again conducted throughout the Region.

The following map (Fig. 6) shows the locations at each of which a minimum of 500 trees were surveyed to detect symptoms characteristic of this disease organism. In addition, many pine stands encountered in routine field work were examined for signs or symptoms of this organism. Fortunately, to date it has not been detected in the surveyed areas.

Just to the north of the Region in the province of Quebec, both the North American and the European strains of this organism have been detected causing considerable damage to young red pine stands.

During the summer of 1985, in the Algonquin Region of Ontario, three locations in which the North American race had been detected also sustained serious damage by the European race. At these three locations sanitation and control measures were carried out in an attempt to eliminate the more virulent European race of this organism.

Fomes Root Rot, *Heterobasidion annosum* (Fr.) Bref.

Fomes root rot continues to be a problem in the older plantations in both Larose Forest in Cornwall District and Limerick Forest in Brockville District.

Each year, several new locations are recorded in these two heavily reforested areas. The small pockets of trees involved (2-5 trees) usually occur on sites that are already under stress. Within these pockets fruiting of this disease organism can be readily found on both live and dead trees.

Monitoring is done on all active pockets of the disease; diseased trees are removed and the stumps are treated.

Tip Blight, *Sphaeropsis sapinea* (Fr.) Dyko & B. Sutton

As in previous years, tip blight was observed at low damage levels in most red pine stands examined for Scleroderris canker damage. The average degree of infection was from 2% to 3% of the current foliage on less than 1% of the trees in the stand examined.

# EASTERN REGION

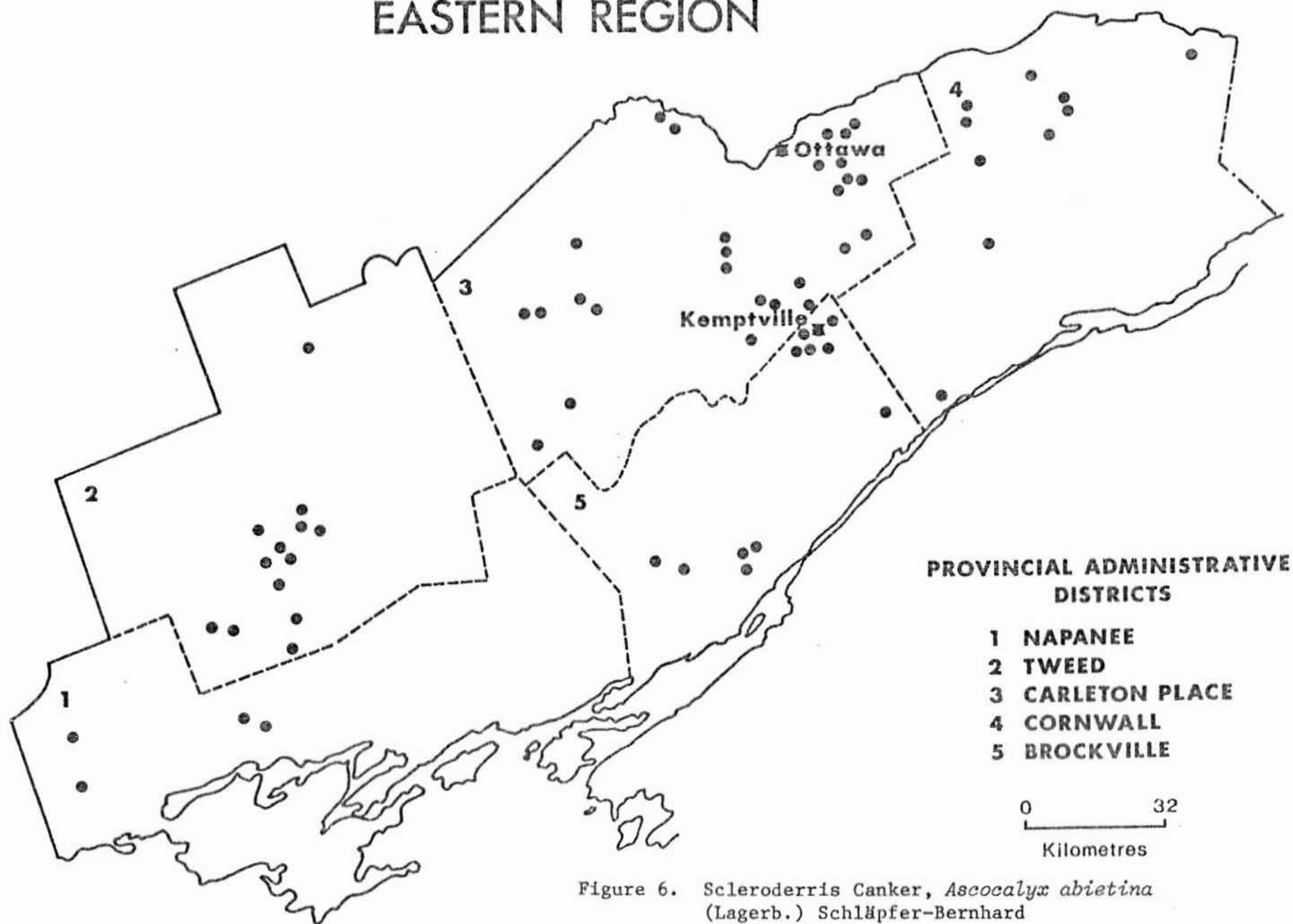


Figure 6. Scleroderris Canker, *Ascocalyx abietina* (Lagerb.) Schlöpfer-Bernhard

Locations at which specific surveys were conducted to ascertain the status of this organism in the Region . . . ●

Austrian pine (*Pinus nigra* Arnold) planted adjacent to roadways by the Ministry of Transportation and Communication suffered by far the worst damage this year. In Anglesea Twp, Tweed District, 18 roadside trees had 40% of the current shoots damaged and in Brighton Twp, Napanee District, five roadside trees had 20% of the current shoots damaged.

#### *Minor Diseases*

Anthracnose, *Aureobasidium apocryptum* (Ell. & Ev.) Hermanides-Nijhof,  
*Diplodia acerina* (Pass.) B. Sutton, and  
*Discula umbrinella* (Berk. & Broome) Morelet

As in 1984, major infections by these organisms (see photo page) were confined to the southern portions of Cornwall, Brockville and Napanee districts.

*D. umbrinella* was found at high levels on beech (*Fagus grandifolia* Ehrh.) in North Crosby Twp, Brockville District. The remaining two organisms were found commonly on damaged sugar maple foliage throughout the adjacent townships of Edwardsburgh, Augusta and Elizabethtown in Brockville District.

#### Pine Needle Rust, *Coleosporium asterum* (Dietel) Sydow

This organism (see photo page) was widely distributed throughout the Region at low levels of infection.

In Brockville District a 15-ha jack pine plantation in Rideau Township had 12% average defoliation while a nearby 4-ha plantation of red pine averaged only trace defoliation of from 1% to 2%. Similarly, in Carleton Place District, red pine plantations throughout Darling, Torbolton and Rideau townships experienced foliar damage of from 1% to 5%.

The high-value red pine plantation survey reported later in this report also showed high incidence levels, with defoliation averaging 1% to 5%.

Table 4. Other forest diseases.

Insect	Host(s)	Remarks
<i>Ciborinia whetzelii</i> (Seaver) Seaver Ink spot of aspen	tA	2-15% damage in Tweed District north of Hwy 7; a 4-ha stand in Hungerford Twp, Tweed District sustained 60-70% defoliation.
<i>Gymnosporangium juniperi-virginianae</i> Schwein. Cedar-apple rust	apple Ce	heavy damage on both hosts in the southern portion of Napanee District in Prince Edward County
<i>Mycosphaerella dearnessii</i> Barr Brown-spot needle blight	muP	One of five ornamental trees along a walkway in the town of Brockville had all old foliage affected; this is a further expansion of this needle blight in Ontario.
<i>Scolecnectria cucurbitula</i> (Tode:Fr.) C. Booth	jP	a low level of damage on a 2-ha stand of 14-m pine in an old burn area in Torbolton Twp, Carleton Place District

## DIEBACKS AND DECLINES

### Hardwood Decline

Pockets of trees continue to show the long-range effect of the 1983 drought condition and the extremely heavy seed crops in 1984. As most of the damage occurs in hardwood woodlots in the Region, a great deal of concern has been expressed about this condition, and about the much publicized possibility of acid rain damage.

To date, all areas examined by the author or by OMNR staff in the Region have obvious problems such as drought, poor site, over-maturity or some other stress factor that can readily be blamed for the decline.

Maples and ashes have suffered heavy upper crown and some whole-tree mortality in the lower, wet areas where water tables have fluctuated greatly in the past two years.

Conifers, to a much lesser degree, have also exhibited sparse crowns and off-color foliage in deep, sandy soils and in shallower limestone soils.

Past experience dictates that the majority of the damage following the 1983 drought should have occurred this year. If no additional stress factors are involved, we would expect to see improved tree vigor throughout the affected areas in 1986.

### Oak Decline

The two oak plots established in 1977 in Lavant Twp, Carleton Place District were retallied in early June of this year in an attempt to evaluate the level of crown deterioration. As stated in last year's report, both the cumulative dieback and current dieback are now being tallied for each tree (Table 5).

The mortality in both plots seems to have reached its peak and the trees have begun to retain more healthy foliage as is reflected in a comparison of 1984 and 1985 tallies in the following table. The trend was not as strong in the Joe Lake plot, and with the damage by gypsy moth to 84% of the plot trees at an average defoliation level of 14% this growing season, the recovery process from the oak decline may be seriously reversed. The plot at Flower Station also had gypsy moth defoliation, but to an insignificant degree.



Table 5. Summary of the results of a retally of two oak plots established in the Eastern Region in 1977 to monitor oak decline.

Location	Avg DBH of sample trees (cm)	Stand size (ha)	Year	Dieback classes <sup>a</sup>											
				Current						Cumulative					
				0	1	2	3	4	5	0	1	2	3	4	5
<u>Carleton Place District</u>															
Lavant Twp															
Joe Lake	26.3	40	1984	10	51	20	6	6	0	0	26	43	15	5	7
			1985	36	35	14	7	1	0	0	26	47	15	5	7
Flower Station	2.14	15	1984	19	48	18	3	2	0	0	19	49	19	3	10
			1985	48	37	3	0	2	0	0	31	47	11	1	10

<sup>a</sup> Dieback classification: 0 = 0-5%, 1 = 6-20%, 2 = 21-40%, 3 = 41-60%, 4 = over 61%, 5 = dead tree.

## ABIOTIC DAMAGE

### Frost Damage

A late spring frost caused considerable damage to low-lying areas of white spruce, balsam fir (*Abies balsamea* [L.] Mill.) and trembling aspen (*Populus tremuloides* Michx.) in the northern portions of both Tweed and Carleton Place districts.

Damage ranged from 10% to 30% on the current shoots of young balsam fir and white spruce regeneration, and from 10% to 15% on the younger trembling aspen regeneration.

The heaviest damage was reported throughout Ashby, Denbigh, Abinger, Miller and North and South Canonto townships in the Tweed District and in Lavant and Darling townships in the Carleton Place District.

### Wind Damage

Strong winds in the Westport area on 7 September caused heavy damage to wooded areas on Big Rideau Lake. Approximately 40 ha of hardwood stands were damaged on Pendletons, Cobourn and Long islands and in shoreline areas in Bass Bay in the adjacent Carleton Place and Brockville districts.

### Winter Drying

Warm temperatures of 4-6° C late in February while the ground was still frozen caused severe browning of conifer foliage in the form of winter drying. As in previous years, trees adjacent to roadways and stand edges with a southerly exposure were most affected.

The heaviest damage once again occurred in the Carleton Place District at the intersection of Anderson Road and Highway 417 in Gloucester Township. At this location the old foliage of red pine was again completely lost but damage was more sporadic than in 1984 when 100% of the trees were affected. In Oxford (on Rideau) Township, Brockville District, white spruce and red pine trees, 10 to 15 m tall, received 50-100% mortality of new buds in pockets of two to five trees.

Elsewhere in the Region, small pockets of two to eight trees suffered foliar damage of up to 40%.

## SPECIAL SURVEYS

### Red Pine Plantation Survey

In an attempt to monitor the effect of pests on conifer plantations in the Eastern Region a specific host species is evaluated each year. This year red pine was the selected host and several plantations were selected across the Region where specific surveys were carried out (Fig. 7).

As in previous years, six stands were to be examined, two in each of three height classes (<2m, 2-6 m and >6 m) when possible. Each stand was examined early in the growing season and again in late August in an attempt to cover the variety of organisms that affect the trees throughout the growing season. Results are summarized in Table 6.

The redheaded pine sawfly was found at low population levels in all plantations examined. The European pine shoot moth, *Rhyacionia buoliana* (Schiff.) was found in low numbers at two of the locations and pine false webworm and white pine weevil were recorded at one plantation, both at low damage levels. Pine needle rust was recorded in four of the seven plantations examined and the needle cast, *Lophodermium* sp., was recorded in two of the remaining three plantations. Both the needle cast and needle rust caused light foliar damage but needle rust was much more prevalent than in the two previous surveys (higher incidence levels). Armillaria root rot accounted for 5% and 8% mortality in the two youngest plantations examined which is an increase over the two previous surveys when no damage by this pathogen was detected.

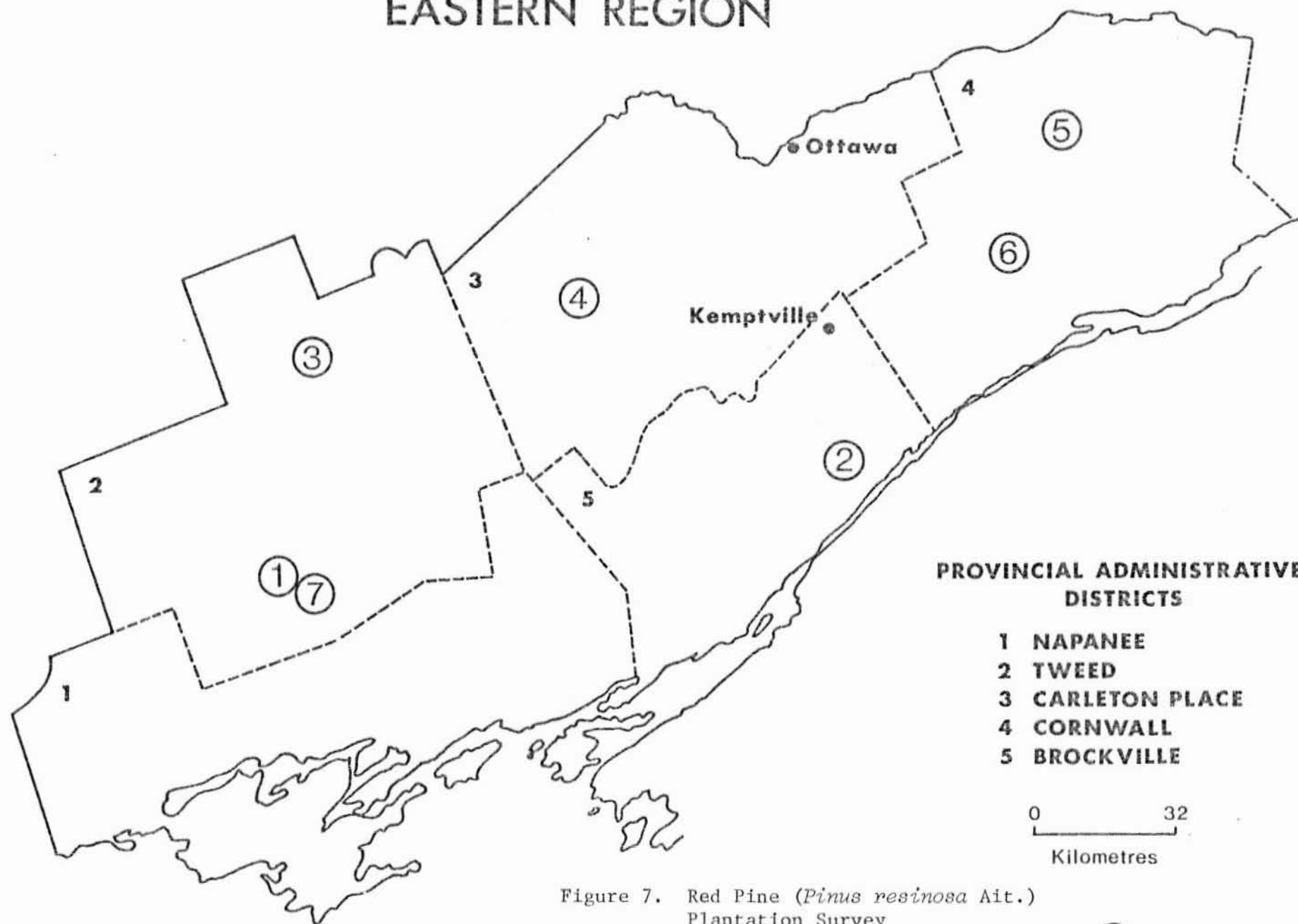
Pests searched for but not found include European pine sawfly, pine root collar weevil, *Hylobius radicis* Buch., Gremmeniella canker and Verticicladiella wilt.

In three of the seven plantations examined, unexplained dead branch tips were recorded on approximately 4% of the trees. In Augusta Township, Brockville District, the 4-m trees, at the time of the second visit, had 91% of the trees affected to a varying degree by a red pine needle midge, *Thecodiplosis piniresinosae* Kearby.

### G. Howard Ferguson Forest Station

Insects: Spring populations of cedar leaf miner were low on the cedar hedges in the nursery; however, higher fall populations necessitated an application of Cygon 2E in late September which gave good control. The spruce windbreaks suffered damage by both orange spruce needleminer, *Pulicalvaria piceaella* (Kft.), and spruce budworm, the latter being sprayed for in the compartments adjacent to Kemptville Creek where 20-30% defoliation was recorded. Willow clones once again experienced high populations of the imported willow leaf beetle, *Plagiodera versicolora* (Laich.), and was effectively controlled with several Malathion applications.

# EASTERN REGION



## PROVINCIAL ADMINISTRATIVE DISTRICTS

- 1 NAPANEE
- 2 TWEED
- 3 CARLETON PLACE
- 4 CORNWALL
- 5 BROCKVILLE

0 32  
Kilometres

Figure 7. Red Pine (*Pinus resinosa* Ait.)  
Plantation Survey

Plot location and number . . . . . ①

Table 6. Summary of the results of a red pine plantation survey conducted at seven randomly selected locations across the Eastern Region in 1985 (counts based on the examination of 150 trees at each location).

Location (Twp)	Plot	Esti- mated no. of trees per ha	Avg ht of trees (m)	Redheaded pine sawfly		European pine shoot moth	Pine false webworm		White pine weevil	<i>Lophodarmium</i> sp.		Armillaria root rot	Pine needle rust	
				Trees affected (%)	Colonies per tree (%)	leaders affected (%)	Trees affected (%)	Nests per tree	leaders affected (%)	Trees affected (%)	Foliage damage (%)	trees dead (%)	Trees affected (%)	Foliage damage (%)
<u>Tweed District</u>														
Hungerford	1	2,450	.71	3.3	2	0.0	0.0	0	0.0	2.0	1.0	8	0.0	0.0
Abinger	3	1,500	1.64	2.0	7	0.0	1.0	5	2.0	0.0	0.0	5	18.0	2.0
Hungerford	7	2,500	5.51	0.5	2	0.0	0.0	0	0.0	1.3	2.0	0	0.0	0.0
<u>Brockville District</u>														
Augusta	2	1,750	4.25	2.0	6	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0
<u>Carleton Place District</u>														
Lanark	4	2,000	1.70	1.3	2	2.0	0.0	0	0.0	0.0	0.0	0	84.7	4.5
<u>Cornwall District</u>														
South Plantagenet	5	1,360	2.95	1.3	3	0.0	0.0	0	0.0	28.0	2.0	0	69.3	2.0
Finch	6	2,375	5.90	1.3	6	2.0	0.0	0	0.0	2.7	2.0	0	11.3	1.0

Gypsy moth larvae were found for the first time in the nursery in mixed hardwood stands adjacent to the seedling compartments. The larvae were present in small numbers and defoliation was negligible. Maples again were lightly damaged by the maple leaf cutter and maple trumpet skeletonizer; fall webworm was common on a wide range of hosts.

Diseases: The larch-poplar rust, *Melampsora medusae* Thüm., was again quite evident in the hybrid poplar plantings. Clonal susceptibility to this disease is quite evident in the nursery and compartments 1 and 41 are annually defoliated by the third week of August. A soil fungus, *Fusarium* sp., was associated with heavy patchy mortality to 1-0 red pine stock in Compartment C3. In addition, Compartment C3 exhibited high numbers of nematodes in the compartments' soil but they do not seem to be a factor in either seedling death or loss of vigor.

Pinewood Nematode, *Bursaphelenchus xylophilus* (Steiner & Buhrer) Nickle

This pest was found in the Eastern Region for the first time in 1984. With the verification of the presence of the pinewood nematode in Ontario, a survey was undertaken in 1985 to try to find the actual distribution pattern of the insect and its association with dead and dying trees.

To accomplish the objectives of this survey all conifer species displaying any signs of wilt or with the presence of blue stain in the stem were submitted to the Great Lakes Forestry Centre laboratory in Sault Ste. Marie to be checked for the presence of nematode.

The accompanying map reflects the work done this past field season and the present status of the samples submitted (Fig. 8).

Acid Rain National Early Warning System (ARNEWS)

Two new permanent ARNEWS plots were established in the Region in 1985. This now brings the number of plots located in the Eastern Region up to three (Fig. 9).

The plot distribution was selected to place one plot in each different acid deposition zone within the Region. The three plots selected were: a white spruce plantation in the greenbelt area in Gloucester Township, Carleton Place District, a white pine plantation near Tweed in Hungerford Twp, Tweed District, and a sugar maple stand near Athens in Rear of Yonge and Escott Twp, Brockville District.

At each location all the trees within a plot 10 metres by 40 metres have been numbered and mapped as have 10 off-plot trees of the referenced species that are within the same stand. Data recorded for each tree included tree dominance, DBH, crown length and width, total

# EASTERN REGION

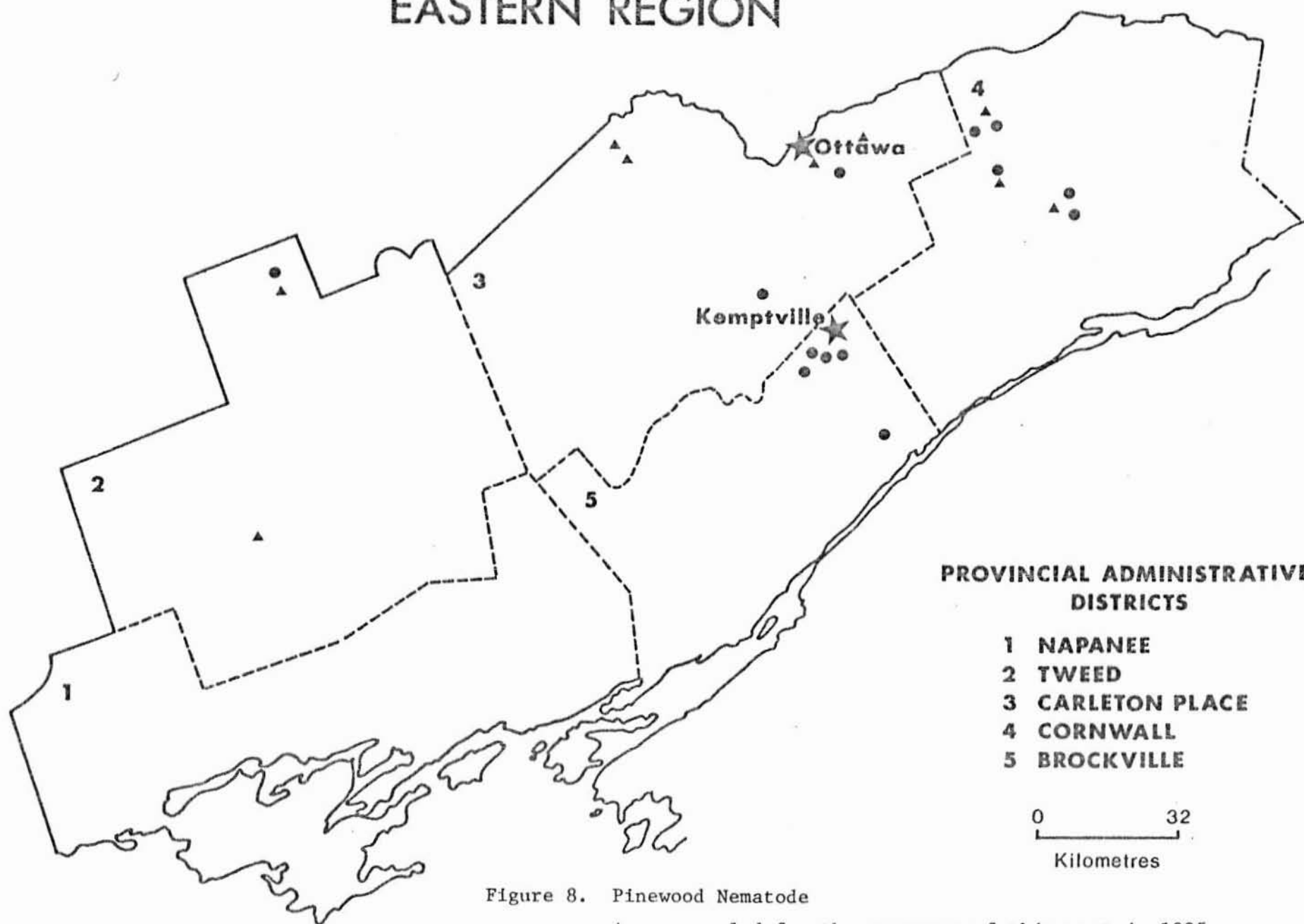


Figure 8. Pinewood Nematode

Areas sampled for the presence of this pest in 1985

Negative sample . . . . . ●

Sample being processed . . . . . ▲

# EASTERN REGION

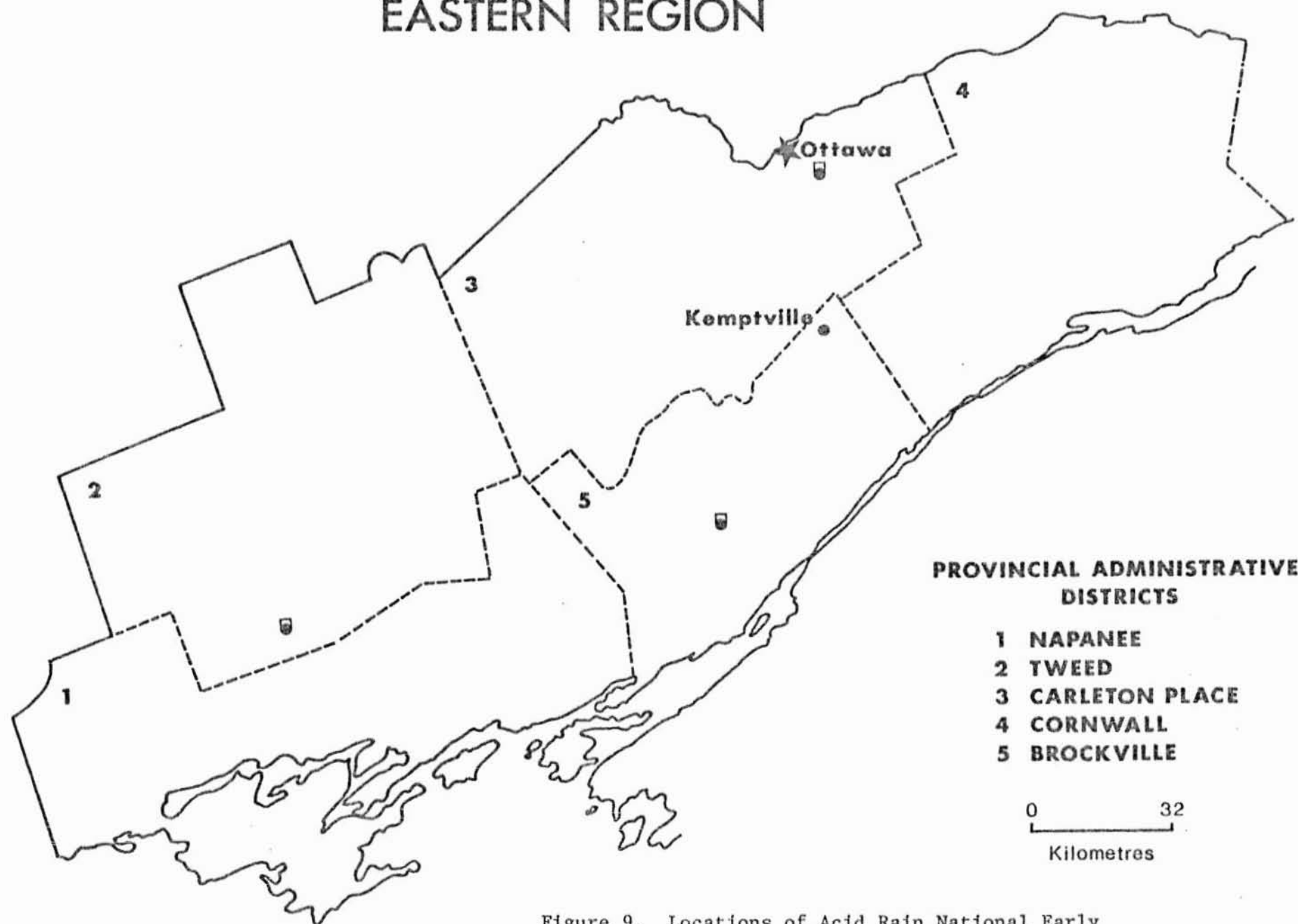


Figure 9. Locations of Acid Rain National Early Warning System (ARNEWS) plots . . .



height, dead tops or branches in crown, color and size of current foliage, impact on trees of insect or disease organisms, and stress signs such as large cone crops or profuse flowering that could adversely affect the trees' vigor in subsequent years.

Subplots, one square metre in size, were established within the main 10 m x 40 m plot at three specified locations. At each subplot all ground cover was tallied by species in predetermined height classifications.

Foliar samples and soil samples are scheduled to be taken from the sample plots at specific intervals to monitor the availability and usability of the key elements by the host trees in each plot over the period of the study.

#### Climatic Data

Variations in seasonal climatic conditions have a direct and obvious affect on forest pests. For example, a cold, wet spring could retard the development of insect eggs, emerging larvae or the production of sporophores. Sudden and extreme changes in normal weather patterns have often been the cause of the decline of infestations over large areas.

For such reasons, daily weather conditions are monitored and permanently recorded for a number of weather observation stations across the province. The data from two of these stations, the Ottawa International Airport and the Trenton Air Base, are summarized in Table 7 for the 12-month period of January to December, 1985.

Table 7. Summary of climatic data for 1985 at two atmospheric environmental stations in the Eastern Region.

Location	Month	Mean temperature		Total precipitation	
		Actual	Normal <sup>a</sup>	Actual	Normal <sup>a</sup>
		(°C)		(mm)	
<u>Napanee District</u>					
Trenton Air Base	Jan.	-9.2	-7.6	50.2	68.9
	Feb.	-6.1	-6.5	110.4	57.0
	Mar.	-0.3	-1.0	90.4	72.0
	Apr.	6.9	6.4	33.8	76.1
	May	13.0	12.5	103.2	73.0
	June	15.8	17.8	47.2	63.7
	July	19.4	20.6	49.0	60.9
	Aug.	18.7	19.7	92.4	71.9
	Sept.	16.0	15.3	58.7	72.8
	Oct.	9.2	9.2	80.0	70.1
	Nov.	2.7	3.2	169.3	86.1
	Dec.	-5.4	-4.5	79.6	82.9
<u>Carleton Place District</u>					
Ottawa International Airport	Jan.	-13.5	-10.6	57.2	61.0
	Feb.	- 7.6	-9.5	69.3	60.3
	Mar.	- 2.0	-3.0	92.4	67.5
	Apr.	5.5	5.6	52.4	69.1
	May	13.4	12.8	68.1	67.9
	June	16.2	18.0	94.8	73.4
	July	20.3	20.6	67.2	85.9
	Aug.	19.3	19.2	71.1	88.4
	Sept.	16.0	14.3	46.2	79.3
	Oct.	8.7	8.1	92.8	68.1
	Nov.	0.3	1.2	63.0	77.7
	Dec.	-8.9	-7.7	60.2	80.7

<sup>a</sup> Normal temperature and precipitation are based on those for the period 1930-1980.