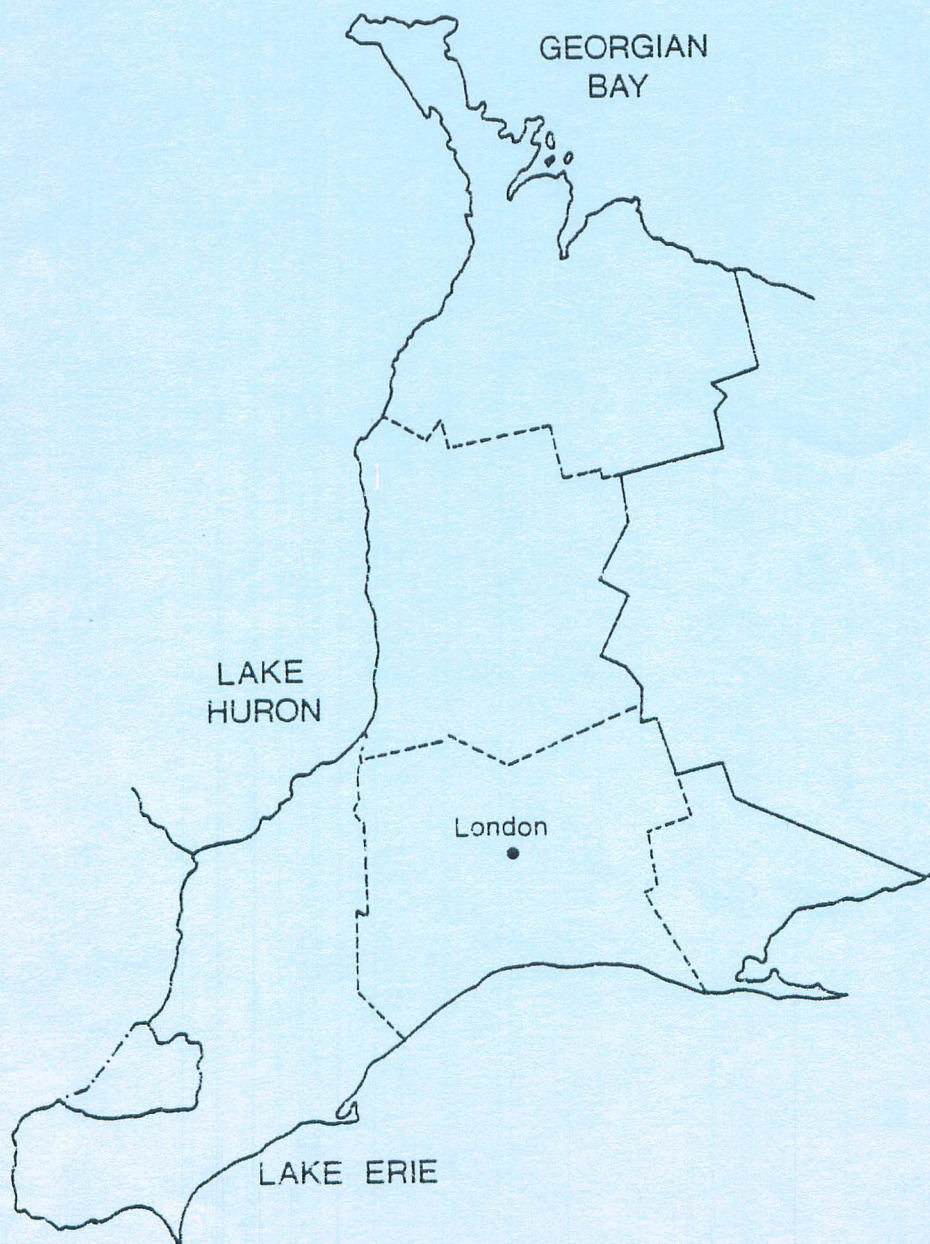


Results of forest insect and disease surveys in the SOUTHWESTERN REGION of Ontario, 1978



CARRIED OUT BY THE GREAT LAKES FOREST
RESEARCH CENTRE IN CO-OPERATION WITH
THE ONTARIO MINISTRY OF NATURAL RESOURCES

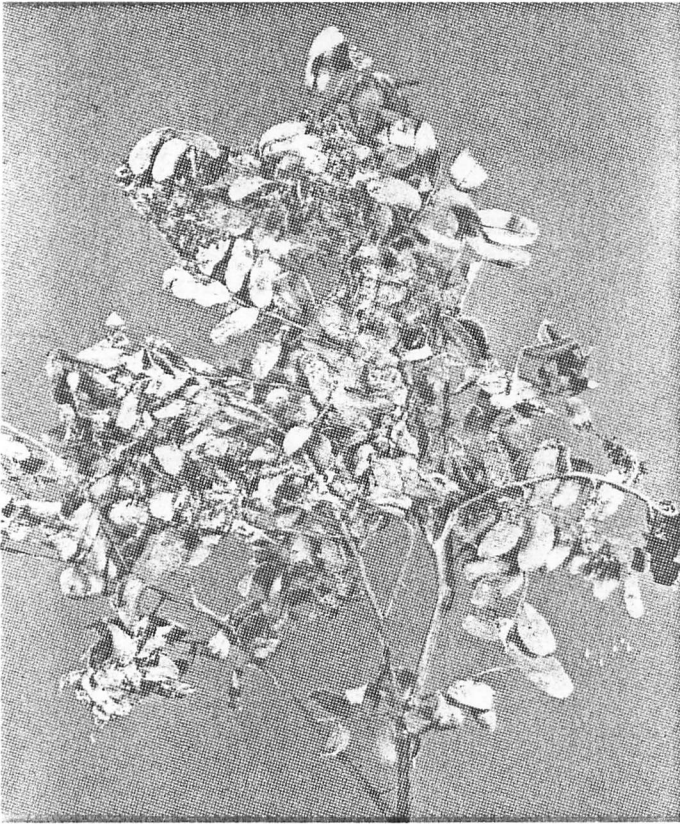
SURVEY HIGHLIGHTS

In 1978, forest tent caterpillar populations virtually collapsed in the Owen Sound and Wingham districts, Southwestern Region. Egg-band counts taken at several locations indicate that small pockets will persist in several townships on the Bruce Peninsula in 1979. Slight increases were evident in population levels of the larch sawfly, walnut caterpillar and cedar leafminers, while the basswood looper and fall cankerworm declined to trace levels. The mimosa webworm which came to the United States from China was found for the first time at Harrow, Ontario, Chatham District, and this is a new record of its occurrence in Ontario.

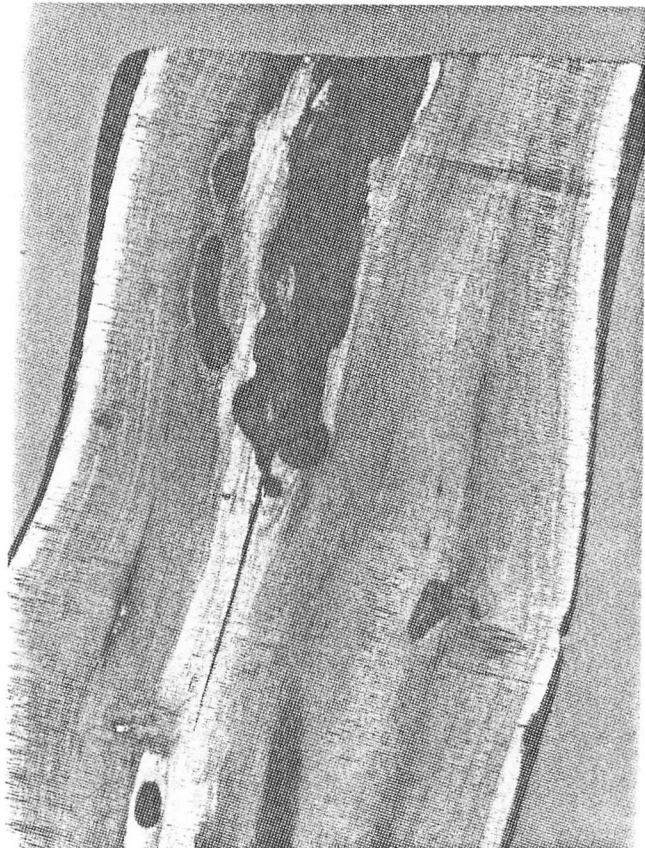
Forest disease surveys concentrated on problems with maple mortality which is occurring in the Wingham and Owen Sound districts. A search of pine plantations (mostly red and Scots pine) for Scleroderris disease was conducted to detect the presence of the disease. All results were negative after examining 500 trees at each of 17 locations. Horse chestnut leaf blotch, leaf anthracnose of maple, ash dieback, winter drying and salt damage were also of concern to private individuals, conservation authorities and forest managers.

D. C. Constable

Frontispiece



Damage to black-locust, caused by the mimosa webworm, *Homadaula anisocentra* Meyrick (= *albizziae* Clark).



Severe tunnelling caused by the locust borer, *Megacyllene robiniae* Forst.)

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INSECTS

Orangestriped Oakworm, *Anisota senatoria* J. E. Smith

For the second consecutive year moderate defoliation occurred on scattered white oak (*Quercus alba* L.) in Southwold Township, Aylmer District, where many roadside trees were severely defoliated. In Yarmouth and Malahide townships of the same district moderate-to-severe defoliation was also observed at many widely scattered locations on open-grown mature trees. Light defoliation occurred on single open-grown trees at Rondeau Provincial Park and in Tilbury Township of the Chatham District. Damage was mainly confined to white oak at most locations; however, feeding was also observed on swamp white oak (*Quercus bicolor* Willd.). This insect was not found elsewhere.

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

Although population levels of this insect complex declined in 1976 and 1977, a general increase in numbers was evident in 1978 throughout the Bruce Peninsula, Owen Sound District. Heavy infestations occurred throughout the townships of St. Edmonds, Lindsay and the north half of Eastnor Township, while particularly severe damage occurred in the Johnson Harbour area of St. Edmonds Township where light tree mortality has occurred. Small pockets of medium-to-heavy infestation were also observed in Keppel, Osprey and Sydenham townships.

Further south in the Southwestern Region moderate browning of foliage to eastern white cedar (*Thuja occidentalis* L.) occurred in Charlotteville and South Walsingham townships, Simcoe District. Shelter-belt trees at the St. Williams Nursery, Simcoe District, were moderately damaged. Very light population levels were also observed at scattered locations throughout the townships of Turnberry, Kinloss and East Wawanosh of the Wingham District.

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-300). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1978, and gives infestation forecasts for the province for 1979.

Larch Casebearer, *Coleophora laricella* Hbn.

Once again severe browning of foliage caused by this insect occurred in a small stand of native larch (*Larix laricina* [Du Roi] K. Koch) at the Waterford conservation area in Townsend Township, Simcoe District. Many trees at this location were 100% defoliated. In the Wingham District severe defoliation also occurred in a stand of mature larch in Kinloss Township but defoliation was mainly confined to scattered pockets within the plantation. In Caradoc Township, Aylmer District, mature European larch (*Larix decidua* Mill.) shelterbelt trees were again severely defoliated. Elsewhere numbers were low.

Walnut Lace Bug, *Corythucha juglandis* Fitch

Severe browning of foliage by the walnut lace bug was apparent at several locations in Charlotteville and South Walsingham townships, Simcoe District. Single and small scattered clumps of butternut (*Juglans cinerea* L.) were heavily infested resulting in foliage turning completely brown and the damaged leaves falling prematurely from the trees. Although this leaf skeletonizer has been reported on black walnut (*Juglans nigra* L.) and basswood (*Tilia americana* L.), butternut was the preferred host in the above townships.

Light-to-moderate damage to black walnut and butternut foliage was also observed in the Point Pelee area and at several locations along Highway 3 from the town of Essex to the city of Windsor.

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

Population levels remained high throughout most of the Region. Moderate-to-severe defoliation occurred at several locations in the Windsor and Leamington areas south to Point Pelee National Park, where all size classes of roadside and ornamental black walnut trees in the Chatham District were damaged. Throughout the Aylmer District, especially along Highway 3 from the town of St. Thomas south to Wallacetown, many roadside plantings were completely stripped of foliage. In the Simcoe District this insect was conspicuous at many locations, but to a lesser degree than in the above two forest districts.

In the Wingham and Owen Sound districts occasional colonies could be found but population levels were generally very low.

Birch Leafminer, *Fenusa pusilla* (Lep.)

High population levels of this introduced leafminer were evident at several locations in the Region. Severe leaf damage was present in many urban areas, woodlots and on open-grown white birch (*Betula papyrifera* Marsh.) stands. Along Highway 26 from Meaford to Thornberry, in the city

of Owen Sound, town of Kincardine and in the Edge Hill area of Osprey Township severe leafmining was observed. Further south in the Region this leafminer was also very conspicuous. Heavy infestations were evident throughout St. Williams, Port Rowan, Simcoe and Port Dover areas of the Simcoe District on a variety of ornamental birches. High levels also persisted on young white birch trees at the Point Farms Provincial Park while mined leaves were observed commonly in the remainder of the Wingham District.

The Mimosa Webworm, *Homadaula anisocentra* Meyrick
(= *albizziae* Clark)

This introduced species from China was first reported in the United States at Washington, D.C., in 1942 and is now widely distributed throughout the United States from New Jersey and Pennsylvania southward to Florida, Alabama and Mississippi to Kansas and Nebraska. The insect was found in 1978 for the first time in the Chatham District, at Harrow, Ontario, and is considered a new record for Canada. Unsightly tents were also observed at other locations in the district (see Frontispiece). Honey-locust (*Gleditsia triacanthos* L.), including the thornless cultivars, were severely damaged along roadside plantings and on private homeowners' lots at Kingsville, Ruthven and west on Highway 3 to the town of Leamington. Although foliage is lost as a result of larval feeding, it is difficult to assess the actual damage to the leaves since the injury is often hidden by webbing. This insect overwinters in the pupal stage in cocoons which are located under scales of bark on the tree, or in plant refuse underneath the tree. The moths appear in early June and lay their eggs on the leaves. Egg laying continues throughout the season and second-instar larvae spin webs around flowers and leaves. Adjacent surfaces of webbed leaves may be skeletonized, turn brown and die. Upon reaching maturity, the larvae pupate, a new generation of moths appears in August, and the cycle is repeated.

Fall Webworm, *Hyphantria cunea* Dru.

No major change in population levels of this defoliator was evident in 1978. This insect was most abundant in the Chatham District throughout the Leamington-Wheatley areas and south to Point Pelee where varying degrees of defoliation occurred on a wide variety of hosts such as fringe and open-grown cherry (*Prunus* sp.), basswood, black ash (*Fraxinus nigra* Marsh.), hawthorn (*Crataegus* sp.), hackberry (*Celtis occidentalis* L.) and hickory (*Carya* sp.). Centres of infestation also occurred in the London-St. Thomas areas of the Aylmer District and along secondary roads throughout the Delhi, Courtland and Otterville areas of the Simcoe District. Further north in the Wingham and Owen Sound districts this tentmaker was less abundant than in the southern areas.

A Leafmining Fly, *Japanagromyza* sp.

This little known blotch miner of oaks was found at widely scattered locations in the Chatham District. Severe leafmining on red oak (*Quercus rubra* L.) caused severe browning and wilting of foliage at Rondeau Provincial Park in Harwick Township and moderate damage throughout Pinery Provincial Park in Bosanquet Township. Small pockets of severe leafmining were also observed along Highway 21 on white oak approximately 1/2 km north of Wyoming, east of Sarnia. Low levels of infestation were also found at various locations on Walpole Island Indian Reserve in Lambton County. Damage was also observed on bur oak (*Quercus macrocarpa* Michx.) at widely scattered points in the district. This insect was not found in 1977.

Eastern Tent Caterpillar, *Malacosoma americanum* F.

High numbers of tents were again common throughout the northern part of the Wingham District. Defoliation was heavy on roadside shrubs, and in abandoned fields and orchards in Turnberry, Culcross, Carrick and Huron townships. In the Owen Sound District particularly high numbers of tents were observed in St. Vincent and Osprey townships. Further south in the Region this common tentmaker could be readily found throughout the districts of Aylmer, Simcoe and Chatham.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

The forest tent caterpillar outbreak which began about 1974 in the Owen Sound District began to collapse in 1978. The only large area of heavy infestation remaining was north of Colpoys Bay on the east side of Albemarle Township, the southeast corner of Eastnor Township and encompassing the entire Cape Cooker Indian Reserve. Moderate-to-heavy infestations also persisted on Hay and White Cloud islands at the mouth of Colpoys Bay and several small pockets were mapped in Keppel, Amabel, St. Vincent, Euphrasia and Collingwood townships (Fig. 1). Light infestations were also mapped on the north side of Hope Bay in Eastnor Township and north of Maxwell in Osprey Township.

In the Wingham District, infestations virtually collapsed. Extremely light defoliation occurred throughout the area of Teeswater in Culcross Township and scattered light pockets were observed in the vicinity of Mildmay in Carrick Township. Further south in the Region occasional colonies were found in Norwich, Charlotteville and South Walsingham townships of the Simcoe District. A single larval colony was also found at Kilworth just west of London in the Aylmer District. Little defoliation was observed in the above two districts.

Egg-band sampling (Table 1) in early fall indicates that varying degrees of defoliation could occur in possibly one or two townships on the Bruce Peninsula of the Owen Sound District in 1979.

SOUTHWESTERN REGION

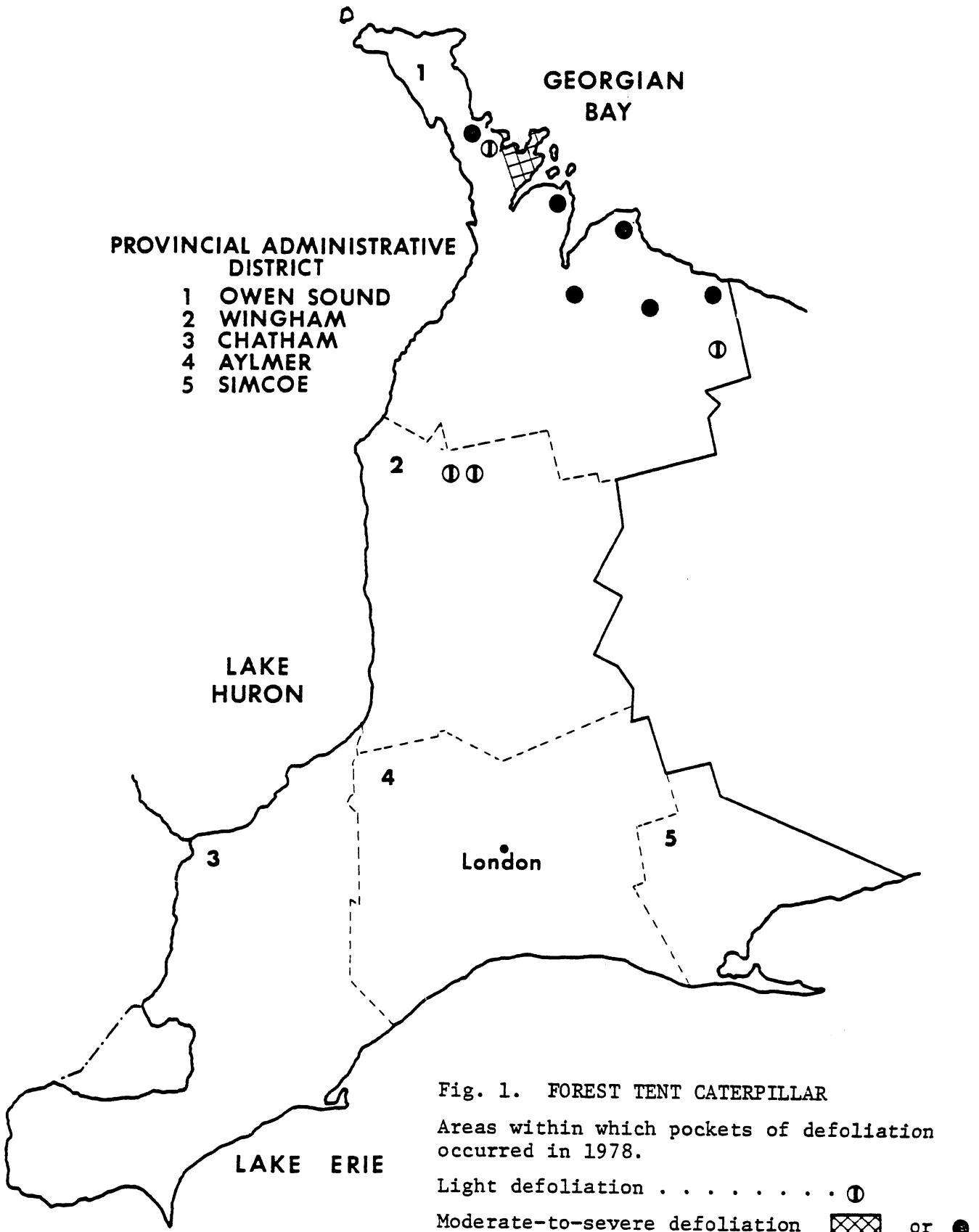


Table 1. Summary of forest tent caterpillar egg-band counts and infestation forecasts for 1979 (counts based on the average number of egg bands on 1.25 m^a branches, one from each of five trees, or on felled trees).

Location	Host	Approx. tree ht (m) ^a	No. of trees sampled	Avg. no. egg bands per tree per branch		Infestation forecast ^b for 1979
Owen Sound District						
Albemarle	sM	7	3	12		M-S
Albemarle	sM	15	3	0.3		U
Albermarle	sM	7	3	1.3		L
Albermarle	sM	13	2	2.0		L
Eastnor	sM	12	3	0		Nil
Eastnor	tA	7	3	4.3		L
Amable	tA	14	3	0.3		U
Wingham District						
Carrick Plot 5	sM	14	-	0		Nil
Carrick Plot 6	sM	14		0		Nil
Carrick Plot 7	sM	14		0		Nil
Carrick Plot 8	sM	14		0		Nil
Culross Plot 9	sM	11		0		Nil
Culross Plot 10	sM	14		0		Nil
Turnberry	sM	14		0		Nil
Wawanosh	sM	12		0		Nil
Morris	sM	12		0		Nil
Howick	sM	15		0		Nil

^a 1 m = 3.28 ft.

^b L = light, M = moderate, S = severe, U = uncertain

The Locust Borer, *Megacyllene robiniae* (Forst.)

This locust borer, one of the most important of the Cerambycids, is found in eastern Canada and throughout most of the United States wherever its host, black locust (*Robinia pseudoacacia* L.) occurs. Adults are present in late summer and eggs are laid in crevices of the bark or around wounds. Larvae bore into the bark and feed until fall. In the spring they tunnel into the wood and construct extensive tunnels throughout the heartwood (see Frontispiece). As the larva grows it enlarges its tunnel to the exterior, through which adults eventually emerge. Signs of infestations are dead and broken limbs, top-killing and knotty swelling

on the trunk, wet spots on the bark in early spring and accumulations of wood dust in the crevices of the bark or at the base of the tree in late summer.

Severe damage occurred in the Simcoe District to a small stand of natural regeneration in Concession II of Charlotteville Township. Trees approximately 10 cm in diameter were weakened as a result of extensive tunnelling throughout the heartwood, and physical damage was apparent. In some cases strong winds toppled infested trees.

At one location just outside the city limits of Sarnia, in the Chatham District, a small stand of mature trees was also severely damaged. Seventy-five percent of the trees within this area had dead or weakened crowns as a result of repeated tunnelling.

Elsewhere in the Region damage was prevalent and easily found and prompted numerous inquiries from landowners. To date no effective control is known.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

This sawfly caused severe defoliation of native and European larch in several townships of the Simcoe District. In South Walsingham Township, complete defoliation to large shelterbelt European larch at the St. Williams Tree Nursery persisted once again. This infestation has been occurring now for a number of years and it appears that no tree or branch mortality has resulted from these attacks. In adjacent townships of North Walsingham and Charlotteville, small, isolated stands of tamarack (*Larix laricina* [Du Roi] K. Koch) were also severely defoliated. North of the town of Simcoe at the Waterford conservation area, native larch was also moderately to severely defoliated for the second consecutive year.

In the Wingham District severe defoliation was again observed in Kinloss Township, while in Colborne Township the infestation intensified from moderate to heavy. In the Chatham District, a small pocket of severe defoliation was found on a mature stand of larch at Highway 401 and County Road 21, 5 km (3 mi.) south of Ridgetown in Howard Township. Moderate-to-severe defoliation occurred at scattered points throughout the Caradoc and Oneida Indian Reserves of the Aylmer District. Scattered medium infestations were observed in Sullivan, Osprey and Artemesia townships of the Owen Sound District.

Table 2. Other forest insects.

Insect	Host(s)	Remarks
<i>Adelges abietis</i> Linn. Eastern spruce gall aphid	wS	moderate infestation on regeneration, Bayham Twp, Aylmer District
<i>Acrobasis juglandis</i> Le Bar. Pecan leaf casebearer	bWa	severe damage to new shoots Malahide Twp, Aylmer District
<i>Adelges cooleyi</i> (Gillette) Cooley spruce gall aphid	Col S	moderate infestation on ornamental trees, St. Williams Nursery, Simcoe District
<i>Alsophila pometaria</i> (Harr.) Fall cankerworm	sM, As, Oak	moderate defoliation at one location, Windham Twp, Simcoe District
<i>Antispila nyssaefoliella</i> Clem. Tupelo leafminer	Tulip	severe leafmining to a small clump of trees, Turkey Point, Simcoe District
<i>Archips fervidanus</i> Clem. Oak webworm	Oak	commonly found on oak regeneration and understory trees, Simcoe and Aylmer districts
<i>Cenopsis acerivorana</i> Mack. Maple leafroller	sM, Ba	heavy infestations on maple; basswood moderately damaged at McGregor Park, Owen Sound District
<i>Choristoneura pinus pinus</i> Free. Jack pine budworm	scP	low population levels, Glenelg Twp, Owen Sound District
<i>Cincticornia pilulae</i> (Beut.) Oak pillgall midge	Oak	small pockets of heavy leaf galls at scattered points, North Walsingham Twp, Simcoe District
<i>Coleophora ulmifoliella</i> MacD. Elm casebearer	Elm	high levels throughout the Region
<i>Colopha ulmicola</i> (Fitch) Elm cockscomb gall aphid	Elm	common throughout Point Pelee National Park, Chatham District
<i>Conotrachelus juglandis</i> Lec. Nut weevil	Bu	severe mining of nuts at scattered points, South Walsingham Twp, Simcoe District

(continued)

Table 2. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Datana ministra</i> Dru. Yellownecked caterpillar	Ba	trace population levels, South Walsingham Twp, Simcoe District
<i>Dioryctria disclusa</i> Heinr. Rusty pine cone moth	scP	moderate damage to new cone crop, North Walsingham Twp, Simcoe District
<i>Diprion hercyniae</i> (Htg.) European spruce sawfly	wS	trace population levels, obtained in beating-tray samples on shelterbelt trees, St. Williams Nursery, Simcoe District
<i>Erannis tiliaria</i> Harr. Linden looper	deciduous	low plantation levels at Derby Twp, Owen Sound District
<i>Neodiprion abietis</i> complex Balsam fir sawfly	bF	heavy infestation at one location, Glenelg Twp, Owen Sound District
<i>Neodiprion pratti banksianae</i> Roh. Jack pine sawfly	jP	low populations on a small stand of trees, Keppel Twp, Owen Sound District
<i>Neodiprion sertifer</i> (Geoff.) European pine sawfly	rP, scP	low population levels through- out the Region
<i>Nymphalis antiopa</i> L. Mourningcloak butterfly	F, tA	commonly found throughout the Region
<i>Rachypsylla celtidismamma</i> Fletcher Hackberry nipplegall maker	Ha	moderate-to-severe damage to foliage at Point Pelee and Holiday Provincial Park, Chatham District
<i>Parectopa robiniella</i> Clem. Locust digitate leafminer	bLo	scattered individual trees moderately defoliated, Sullivan Twp, Owen Sound District
<i>Petrova albicapitana</i> (Busck.) Northern pitch twig moth	jP	caused moderate damage on a young stand of planted trees, South Walsingham Twp, Simcoe District; low levels in West Williams Twp, Aylmer District

(continued)

Table 2. Other forest insects (concluded).

Insect	Host(s)	Remarks
<i>Phaecasiophara niveiguttana</i> Grote A leafroller on sassafras	Sa	high population at one location, Windham Twp, Simcoe District
<i>Phratora americana canadensis</i> Brown Willow leaf beetle	W	commonly found on fringe trees, Downie Twp, Wingham District
<i>Pissodes strobi</i> (Peck) White pine weevil	wP, rP	light infestations occurred in Holland and Sydenham twp, Owen Sound District
<i>Pristiphora geniculata</i> (Htg.) Mountain ash sawfly	Mo	found in varying numbers on ornamental and roadside trees throughout Region
<i>Proteoteras willingana</i> Kft. Boxelder twig borer	mM	high population levels in Yarmouth Twp, Aylmer District; moderate throughout Keppel Twp, Owen Sound District
<i>Pulicalvaria abietisella</i> Pack. Green hemlock needleminer	He	moderate needle mining on mature trees, Oakland Twp, Simcoe District
<i>Rhyacionia buoliana</i> Schiff. European pine shoot moth	rP, scP	low population levels throughout the Region
<i>Vasates quadripes</i> Shim. Maple bladdergall mite	siM	heavy on scattered trees at Wheatley Provincial Park, Romney Twp, Chatham District; moderate levels on individual trees at the Bachus Tract, South Walsingham Twp, Simcoe District
<i>Zeiraphera canadensis</i> Mut. & Free. Yellow spruce shootworm	wS	moderate defoliation of new shoots on shelterbelt trees, St. Williams Nursery, Simcoe District

TREE DISEASES

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

Defoliation caused by *Diplodia pinea* (Desm.) Kickx increased substantially in 1978. At the old Turkey Point arboretum, Simcoe District, defoliation increased to moderate and heavy levels and was present on approximately 10% of the Austrian pine (*Pinus nigra* Arnold). Infection has also spread into neighboring Ponderosa pine (*P. ponderosa* Laws.) and red pine (*P. resinosa* Ait.). Heavy defoliation caused lower branch mortality on many roadside plantings of Austrian and Scots pine (*P. sylvestris* L.) at the Holiday Provincial Park in Chatham District. In the Aylmer District much flagging and lower branch mortality were found on Scots pine near Mossley in North Dorchester Township. A continuation of this disease, which causes mortality of current year's growth, could result in tree mortality.

Scleroderris Disease, *Gremmeniella abietina* (Lagerb.) Morelet

The European race of *Gremmeniella abietina* has caused severe mortality to Scots pine and red pine of all age classes at numerous locations in the states of New York and Vermont. The disease was found for the first time near the village of Powers Court in the province of Quebec in 1978, 2 km (1.2 mi.) north of the New York border. Immediate quarantine and sanitation procedures were conducted by the Forest Insect and Disease Survey group of the Laurentian Forest Research Centre in Quebec by destroying all infected material. Both Canadian and American authorities have imposed quarantines to impede the spread of the disease. In the United States shipment of material capable of harboring Scleroderris from affected areas is prohibited. The Canadian quarantine screens the importation of susceptible host materials from all parts of the world where the European race exists. The quarantine reduces the risk of accidental introduction, and hopefully this will provide the time needed to research and develop control methods.

An extensive survey was carried out in the Southwestern Region to determine whether the disease was present in 1978 (Fig. 2). Seventeen pine plantations (red and Scots) were examined and a total of 500 trees at each site inspected. No disease symptoms were found.

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

Foliar damage by this leaf disease was again prevalent at varying degrees at scattered points in the Region (Table 3). Trees in urban and roadside situations were much more severely damaged than those growing in the interior of stands. Sugar maple (*Acer saccharum* Marsh.) was the principal host although other maple species were also affected.

SOUTHWESTERN REGION

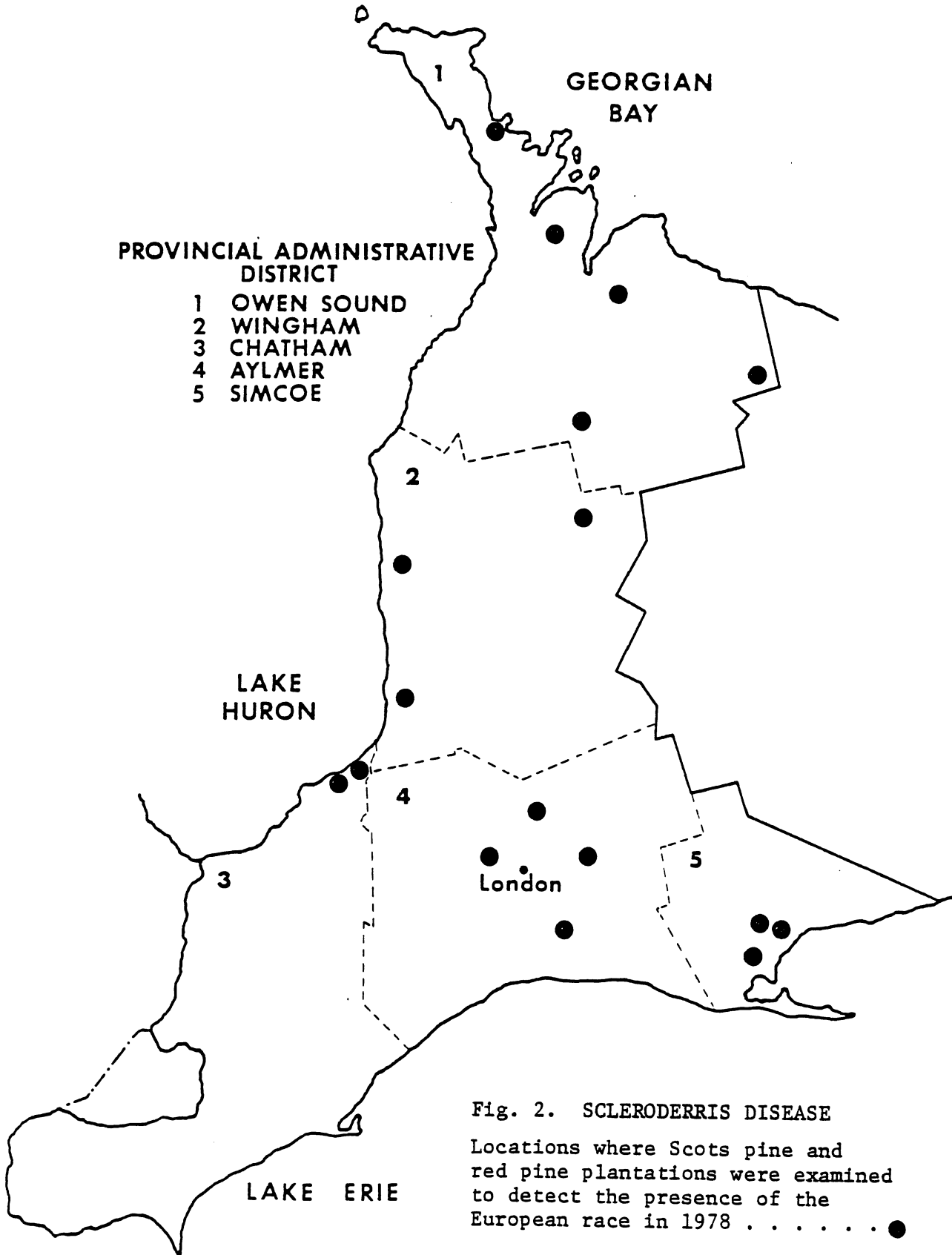


Table 3. Summary of damage caused by leaf anthracnose of sugar maple at 10 locations in 1978 (100 trees examined at each location).

Location	Avg ht of trees (m) ^a	Trees affected (%)	Foliage damaged (%)
Wingham District			
West Wawanosh	11	27	50
Culross	14	19	10
Hullett	11	20	10
Aylmer District			
West Williams	12	33	30
London	14	2	5
Westminster	11	10	10
Yarmouth	11	5	5
Simcoe District			
Townsend	14	17	25
Woodhouse	12	10	10
Woodhouse	8	13	90

^a 1 m = 3.28 ft

Horse Chestnut Leaf Blotch, *Phyllosticta paviae* Desm.

This foliar disease, which has been a perennial problem in recent years, was much more severe than in 1977. Particularly heavy damage occurred throughout several areas in the Chatham District. Ornamental plantings and many single open-grown roadside trees along Highway 18 from the town of Harrow to Leamington were 100% infected.

In Wheatley Provincial Park heavy damage occurred on shagbark hickory (*Carya ovata* [Mill.] K. Koch). High levels of damage were observed throughout the towns of Simcoe and Port Dover and at many scattered points throughout the cities of Woodstock, St. Thomas and London in the Simcoe District. Further north, moderate infections occurred in Meaford and Owen Sound while light levels were common in the Wingham District.

Ash Dieback

This condition is characterized by a progressive dying back of tree crowns; it is commonly characterized by fungus-caused cankers on affected tree parts. In 1978, this condition was observed at several locations

in the Region. Severe top killing and some tree mortality occurred on ornamental and roadside white ash (*Fraxinus americana* L.) trees in the Kincardine-Owen Sound areas of the Owen Sound District. Further south, in the Wingham District, scattered white and green ash (*F. pennsylvanica* var. *lanceolata* [Borkh.] Sarg.) plantings at the Wildwood conservation area and single white ash trees at Point Farms Provincial Park were moderately damaged. Light-to-moderate damage was also observed in the Wingham-Strafford areas of the above district. Elsewhere in the Region dieback was observed and caused much concern to private property owners and the Ontario Ministry of Natural Resources.

Maple Decline

In the Owen Sound District, little change in mortality levels was observed in stands affected in 1978. However, more maple stands within this area suffered patches of mortality, particularly in Sullivan and Holland townships. New areas of mortality were observed north of Maxwell in Osprey Township, in Artemesia Township and in the Minniehill area of St. Vincent Township. In addition, crown deterioration was evident--thin foliage and branch mortality were commonly observed in most of Grey County and in the southern portion of Bruce County. In the Owen Sound District, 2749 sugar maple trees in privately and publicly owned stands were examined to determine the amount of decline present in the district (Table 4). Six decline (branches dead) classes were used in the survey.

Although no major spread of tree mortality has been observed in the Wingham District, several new pockets occurred within the townships of Culross and Carrick where mortality was observed in 1977. To date six areas less than 1 hectare in size have been located. This maple problem is still being studied by staff of the Great Lakes Forest Research Centre in cooperation with personnel from the Ontario Ministry of Natural Resources.

Salt Damage

As in previous years this problem was once again evident at numerous locations along the more heavily travelled roads. Particularly severe damage occurred along Highway 401 west of London to Windsor, and along Highway 3 east and west of St. Thomas. Light-to-moderate damage occurred along Highway 6 south of Owen Sound to Durham and at scattered points between Chatsworth and Flesherton on Highway 4. Although most conifers were damaged, white pine (*Pinus strobus* L.) and red pine plantings appear to be most susceptible.

Table 4. Percent decline or branch mortality evident on sugar maple in 19 plots sampled in the Owen Sound District in 1978.

Decline class (% branches dead)	% Dominant and co-dominant trees affected	% Intermediate suppressed trees affected	% all sugar maple trees affected
0 (0 - 5%)	75.7	65.8	70.9
1 (6 - 20%)	18.1	16.4	17.3
2 (21 - 40%)	3.3	3.2	3.2
3 (41 - 60%)	1.7	2.4	2.1
4 (> 60%)	0.4	2.8	1.6
5 (dead)	0.8	9.4	4.9

Winter Drying

This condition occurs during mid-winter or early spring. It is most common on conifers, although deciduous hardwoods are sometimes affected. The generally accepted explanation for this condition is that needles lose moisture during periods of high temperatures accompanied by drying winds. The roots are unable to replace this water loss either because of low soil temperatures or because the stem is frozen and water is unable to pass through. This results in the desiccation of tree parts above the snow, resulting in a form of drought.

In 1978, the condition was prevalent at the Waterford conservation area, Townsend Township, Simcoe District. Severe browning of foliage was evident on a small pocket, 4 ha (10 ac) in size, of mixed white pine and eastern white cedar (*Thuja occidentalis* L.). At this location 100% of the trees of both species were affected. Fifty percent of the foliage was damaged on white pine as compared to 100% foliar damage on white cedar. In Concession I of Middletown Township, light-to-moderate damage also occurred on two private Christmas tree plantations. In Euphemia Township, Chatham District small scattered pockets of light damage were common in many privately owned red and Scots pine plantings. Further north, in the Owen Sound District, this condition was widespread. Particularly severe damage was observed on planted white pine in Sydenham, Holland and Osprey townships. Lesser degrees of damage were evident on a number of coniferous species throughout the northern and eastern parts of the district. Elsewhere in the Region damage was generally light.

Table 5. Other forest diseases

Organism	Host(s)	Remarks
<i>Arceuthobium pusillum</i> Pk. Eastern dwarf mistletoe	wS	moderate damage St. Edmunds Twp, Owen Sound District
<i>Apiosporina morbosa</i> (Schw.) Arx. Black knot	ecCh	moderate damage at scattered locations throughout Region
<i>Armillaria mellea</i> (Vahl ex Fr.) Kummer Shoestring root rot	sM, wS, wP	light tree mortality recorded at scattered locations throughout Region
<i>Ceratocystis ulmi</i> (Buism.) C. Moreau Dutch elm disease	E	continued to kill many of the remaining elms in the Region
<i>Coleosporium asterum</i> (Diet.) Syd. A needle rust on pine	rP	medium infections in Holland and Keppel twp, Owen Sound District
<i>Cylindrocladium floridanum</i> Sob. and Seymour Cylindrocladium root rot	ec	infected seedbed Comp. 29, St. Williams Nursery, Simcoe District
<i>Cytospora</i> sp. Cytospora canker	sM, Be	associated with branch cankers and dieback at a number of locations in the Region
<i>Diaporthe spiculosa</i> (Alb. & Schw.) Nit.	Su	high percentage of regeneration affected in Charlotteville Twp, Simcoe District
<i>Endocronartium harknessii</i> (J.P. Moore) Y. Hiratsuka Globose gall rust	scP	moderate-to-heavy damage throughout plantings at Turkey Point, Charlotteville Twp, Simcoe District
<i>Fomes annosus</i> (Fr.) Karst Annosus root rot	rP, wP	scattered pockets of heavy root rot throughout the Turkey Point, Charlotteville Twp, Simcoe District
<i>Fomes rimosus</i> (Berk.) Heart rot fungus	bLo	heavy fruiting found on dead lateral branches in association with a locust borer, Sarnia Twp, Chatham District

(continued)

Table 5. Other forest diseases (concluded).

Organism	Host(s)	Remarks
<i>Gleosporium catalpae</i> E. & E. Leaf anthracnose fungus	catalpa	severe foliage damage at scattered points in the Region
<i>Gymmosporangium juniperi-virginianae</i> Schw. Cedar - apple rust	Ap	heavy infection at Hay Creek, Charlotteville Twp, Simcoe District
<i>Libertella faginata</i> Desm. Libertella dieback	Be	fruiting found on dead branches at scattered locations in the Region
<i>Melampsora abietis-canadensis</i> Ludw. ex Arth. A cone rust	cH	light infection of cone rust in Albermarle Twp, Owen Sound District
<i>Phyllosticta caryae</i> Pk. Hickory leaf spot	Hi	heavy damage on regeneration St. Williams Forest Station, South Walsingham Twp, Simcoe District
<i>Phyllosticta minima</i> (Berk. & Curt.) Ell. & Ev. Purple eye spot	rM, moM	light infection throughout Region