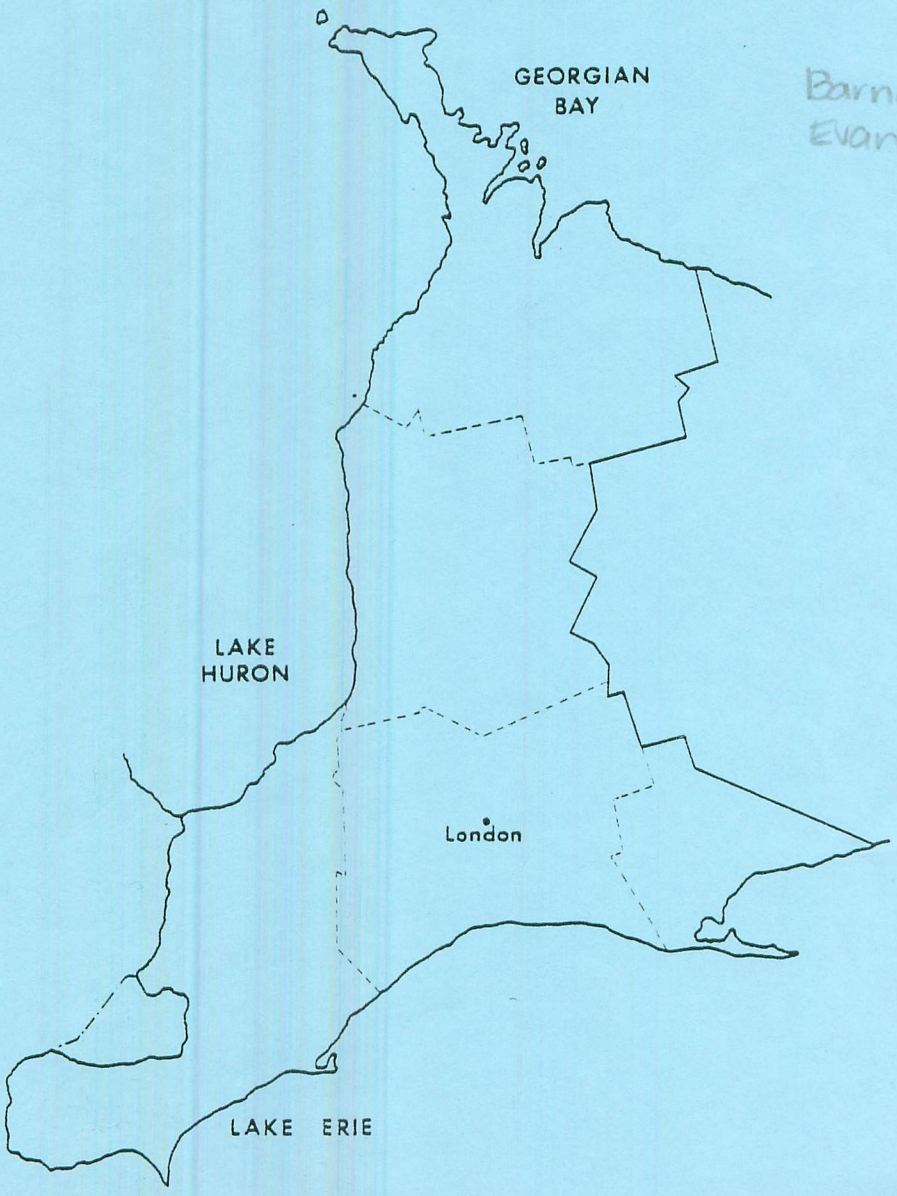
Results of forest insect and disease surveys in the SOUTHWESTERN REGION of Ontario, 1981



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

SURVEY HIGHLIGHTS

The following report covers the more important insect and disease conditions in the Southwestern Region in 1981. As in 1980, medium-to-heavy infestations of spruce budworm persisted at many points in Owen Sound, Wingham and Simcoe districts, particularly in the Bruce Peninsula. A decline was noted in the small pockets of infestation that have persisted for the past several years in the Aylmer District. A complex of cedar leafminers continued to cause severe defoliation of white cedar at many points throughout the Region; however, population levels were lower in 1981 than in 1980. Deciduous tree defoliators such as walnut caterpillar, fall webworm and orange-humped oakworm caused varying degrees of damage at many locations. Infestations of the larch case-bearer, larch sawfly, European pine sawfly, and orange-striped oakworm decreased in intensity in 1981. The heavy infestation of the cottony maple scale reported in the Windsor-Essex-Chatham area in 1980 collapsed in 1981. Little permanent damage by this scale insect was observed on ornamental maple.

As in 1980, forest disease surveys concentrated on the detection of Scleroderris canker (European race) of pine. Fifteen areas were checked thoroughly; however, no evidence of the disease was found. Oak and maple plots were tallied to monitor the decline of these two species. Leaf anthracnose of maple and horse chestnut leaf blotch declined in intensity in 1981. Abiotic conditions such as frost, winter drying and salt damage caused appreciable damage to many species of trees.

For the past three years special surveys have been conducted to rate important pest problems in red pine and white pine plantations. In 1981 a survey was carried out in white spruce plantations as well.

The format of the Table of Contents has been changed this year to simplify the rating scheme for both insects and diseases. The criteria used to categorize the insects and diseases are 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 sporadic or localized injury but not usually a serious threat to living trees or shrubs

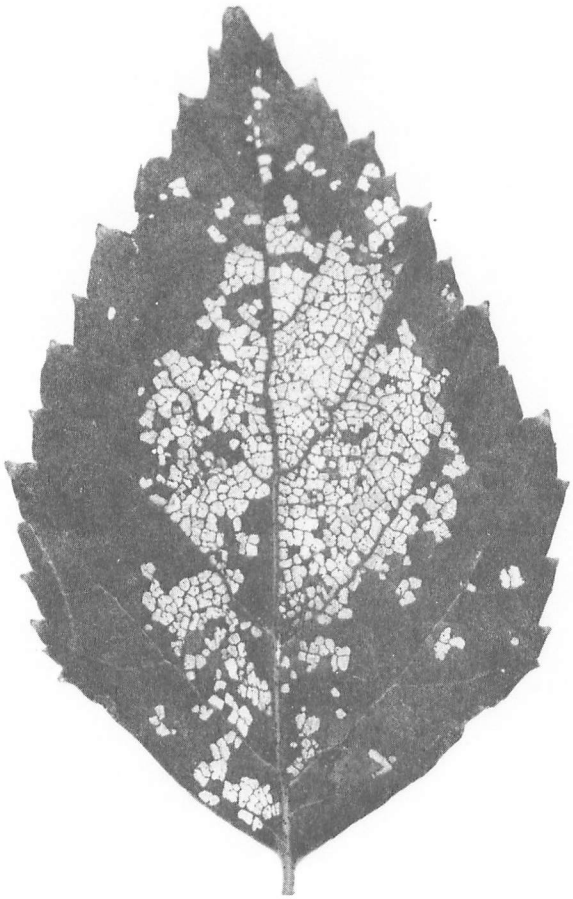
Other Forest Insects/Diseases (Tables)

These tables provide information on two types of pest: 1) those which are of minor importance and have not been known to cause serious damage to forest trees, and 2) those which are capable of causing serious damage but, because of low populations or for other reasons, did not cause serious damage in 1981.

The authors would like to express their appreciation to the personnel of the Ontario Ministry of Natural Resources for their excellent cooperation during the 1981 field season.

C. A. Barnes

H. J. Evans



Frontispiece. Defoliation of a white birch (*Betula papyrifera* Marsh.) leaf by the birch skeletonizer (*Bucculatrix canadensisella* Cham.)

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INSECTS

Major Insects

Pine False Webworm, *Acantholyda erythrocephala* (Linn.)

This web-spinning insect, which was found for the first time in the Owen Sound District in 1980, continued to cause appreciable damage to Scots pine (*Pinus sylvestris* L.) and red pine (*P. resinosa* Ait.) trees at two locations in 1981. As in 1980, a moderate infestation persisted in a 4 ha Scots pine plantation near Bells Lake in Glenelg Township, and resulted in 30% defoliation. A new infestation was detected in a 2 ha red pine plantation south of Maxwell in Osprey Township, where defoliation ranged up to 30%. An extension in the known range of this insect was noted in 1981 when trace numbers of larvae were observed on red pine in Greenoch Township and on mugho pine (*P. mugo* Turra var. *mughus* Zenari) in the Walkerton area. Larvae were not observed elsewhere in the Region.

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

In past years this insect on white oak (*Quercus alba* L.) and red oak (*Q. rubra* L.) has caused varying degrees of defoliation at many points in the Region; however, in 1981, population levels declined and only light infestations were noted in previously infested areas. (See results of forest insect and disease surveys for the Southwestern Region, 1980.) This decline was most evident in and around Point Pelee National Park and Rondeau, Ipperwash and Pinery provincial parks where only occasional colonies were observed and defoliation was trace to light this year. In the Aylmer and Simcoe districts no colonies of larvae were observed in 1981, whereas there were light-to-moderate infestations in Mosa Township, Aylmer District and near the town of Simcoe, Simcoe District in 1980.

Pine Spittlebug, *Aphrophora cribrata* (Wlk.)

Although this insect caused appreciable damage to white pine (*Pinus strobus* L.) and Scots pine at numerous locations in the Region in 1981, populations were significantly lower than those observed in 1980. The most notable damage occurred in a 4 ha white pine plantation near Normandale, Simcoe District where most of the trees had spittle masses. In the Aylmer District clumps of Scots pine trees were moderately damaged in Mosa and West Oxford townships and upwards of 50% of the trees were infested in the Public Utilities Commission plantations near Sweaburg. In the Wingham District small localized infestations were noted in white and Scots pine plantings in the Robertson tract in Colborne Township. Elsewhere in the Region the insect was commonly observed but generally at low levels.

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

Although white cedar (*Thuja occidentalis* L.) was severely damaged by cedar leafminers at many points in the Region in 1981, the overall area infested was considerably less than that recorded in 1980. In 1981 moderate-to-heavy infestations were observed in an area of approximately 14,500 km^2, compared with 23,700 km^2 in 1980. The reduction in area is due to the decline in infestations in the Wingham and Owen Sound districts.

In the Owen Sound District pockets of infestation persisted in the Owen Sound area and at scattered points in the Bruce Peninsula. In the Kincardine area small localized pockets of infestation were common. In the Wingham District, except for the Goderich and Bayfield areas and along Highway 21 north of Grand Bend, a general decline in population levels was evident. Heavy infestations persisted in the Aylmer and Simcoe districts where small pockets and hedgerows of cedar were severely damaged at many points. The most notable damage occurred near Turkey Point in the Simcoe District and near the towns of Simcoe, Delhi, Aylmer and Tillsonburg. Figure 1 reflects the approximate boundaries and pertains only to the infestations that occur within the crosshatched portion of the map.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

This skeletonizing insect (see Frontispiece) on white birch (*Betula papyrifera* Marsh.) occurs in infestation proportions approximately every 8 to 10 years. The last occurrence was during the years 1969-1973. In 1981 population levels increased sharply and infestations were widespread. The most notable infestations were in solid stands of white birch in the Miller Lake area of Lindsay Township, Owen Sound District, where defoliation was 100%. Elsewhere in the Owen Sound District, moderate-to-severe defoliation was observed in several locations in Lindsay and St. Edmonds townships and on occasional trees in Keppel Township. Moderate damage was noted on several islands near Tobermory. Up to 200 ha of white birch were infested in all areas surveyed. As this is a late-occurring insect, the field season was over before aerial mapping could be carried out.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of damage surveys, population sampling, and egg-mass counts will be included with those of other Regions in a special report to be published later this year. That report will provide a complete description and analysis of developments in the spruce budworm situation in Ontario in 1981 and will give infestation forecasts for the province for 1982.

SOUTHWESTERN REGION

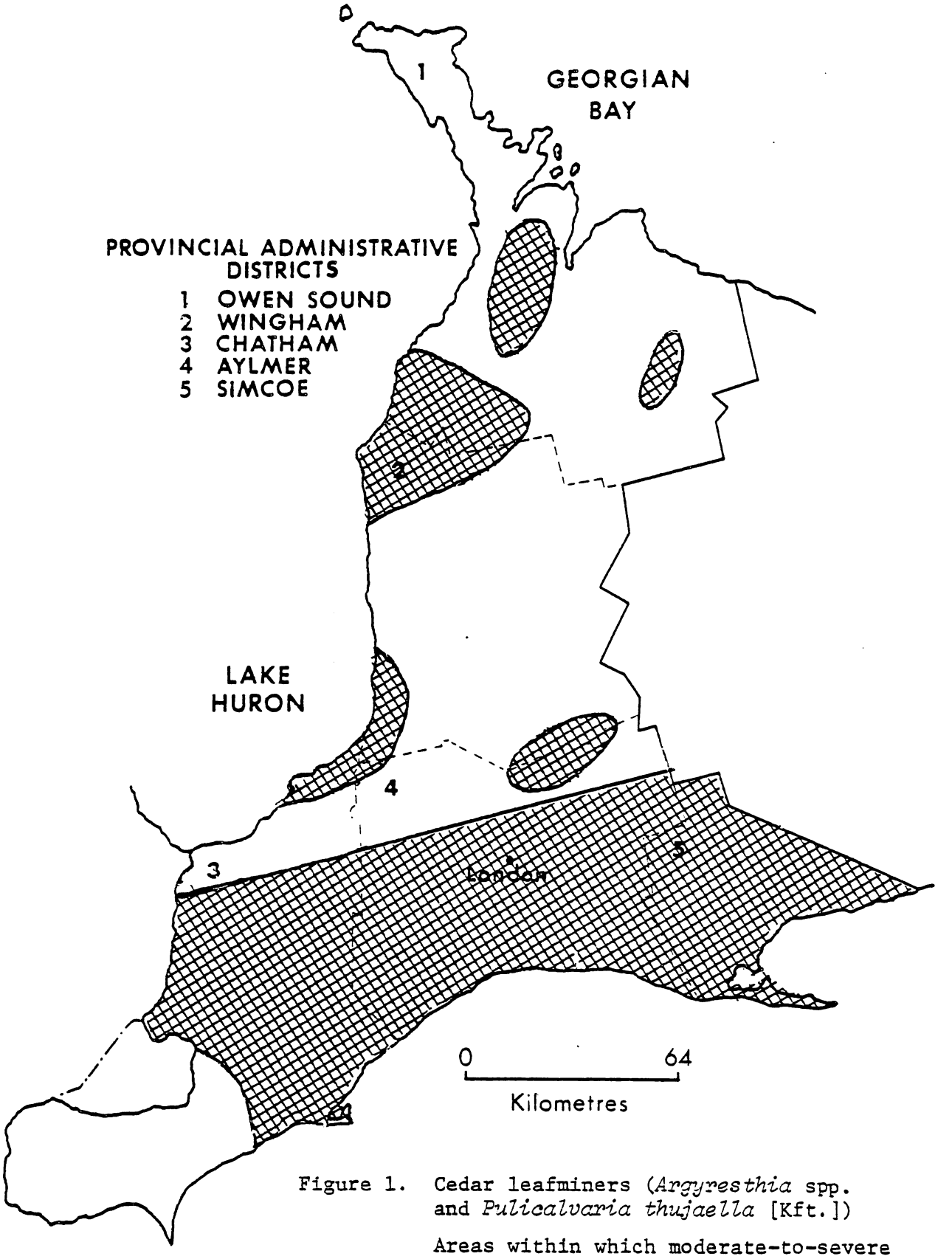

Figure 1. Cedar leafminers (*Argyresthia* spp. and *Pulicalvaria thujaella* [Kft.])

Areas within which moderate-to-severe defoliation of eastern white cedar (*Thuja occidentalis* L.) occurred in 1981 . . . . . ▨

Larch Casebearer, *Coleophora laricella* (Hbn.)

Although heavy infestations persisted in some areas where severe defoliation occurred in 1980, a general decline in infestations was evident in 1981. Heavy infestations were noted in a 1 ha planting of tamarack (*Larix laricina* [Du Roi] K. Koch) along Highway 401 east of London in North Dorchester Township, Aylmer District. Defoliation was approximately 50%. In the Owen Sound District there was a moderate infestation in a 1 ha planting of European larch (*L. decidua* Mill.) near Chatsworth, where defoliation was 30%. Elsewhere in the Owen Sound District a light infestation was noted on scattered tamarack in Osprey Township. In the Simcoe District populations declined to low levels, and only trace-to-light defoliation was noted on tamarack and European larch at the St. Williams Forest Station. In Wingham District, larval numbers were reduced in the Dr. Murray plantations in Downie Township, in the Robertson tract in Colborne Township, and in the Ellice swamp in Ellice Township. In Chatham District, few larvae were observed near Pinery Provincial Park where occasional trees had been infested in 1980.

European Pine Needle Midge, *Contarinia baeri* (Prell)

In the past few years there have been sporadic infestations of this needle midge on Scots pine and red pine in the Region. Generally, damage caused by the feeding habits of this insect affects the commercial and aesthetic value of the trees. Infestations are usually of short duration and infested trees tend to recover well, without any permanent damage. In the Owen Sound District, population levels increased at two locations in Holland Township where a small 0.5 ha Scots pine plantation was moderately damaged by this insect. Small numbers of midges were found on red pine trees in Greenock and Keppel townships as well. Elsewhere in the Region no evidence of the insect was noted.

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

Although populations generally remained at low levels in the Region, small pockets of light infestation occurred at widely separated locations in 1981. A heavy infestation that was reported in 1980 on red oak near Emmett Lake in St. Edmunds Township declined to light intensity in 1981. Small numbers of larvae were collected from red oak in the Pinery Provincial Park area and near St. Williams; however, defoliation was of little consequence. Egg counts carried out in the Owen Sound and Simcoe districts in 1981 indicate a recurrence of light infestations in 1982.

Birch Leafminer, *Fenusa pusilla* (Lep.)

As in the past several years, population levels have remained high at numerous locations in the Region. Defoliation of white birch and a variety of ornamental birches was widespread in all districts. Severe leafmining of open-grown trees was particularly common in the general area of Simcoe, Delhi and Port Rowan in Simcoe District; near Woodstock, Aylmer and at many points along Highway 401 in Aylmer District; and at many points in Wingham, Chatham and Owen Sound districts. Open-growing and ornamental birches were more heavily damaged than birch growing in pure stands.

Fall Webworm, *Hyphantria cunea* (Dru.)

There were heavy infestations of this web-spinning insect on roadside and open-growing trees throughout the Region in 1981. It attacks many deciduous hosts, but some of the more important species attacked in the Region were black walnut (*Juglans nigra* L.), butternut (*J. cinerea* L.) and the ashes (*Fraxinus* spp.). These and other deciduous hosts were moderately defoliated from Simcoe west to Windsor and from Lake Erie north to Tobermory.

Heavy infestations persisted at many points in the Chatham District, particularly in and around Point Pelee National Park, Wheatley and Rondeau provincial parks, and also in Pinery Provincial Park near Grand Bend. High populations were also common near London, at many points near Aylmer and Woodstock and along Highway 401 east and west of London in the Aylmer District. In the Owen Sound District there was an increase in population levels near Owen Sound and Meaford. In the Wingham District localized infestations were common, particularly near Stratford and St. Marys.

Balsam Fir Sawfly, *Neodiprion abietis* complex

As in 1980 Owen Sound was the only district in the Region reporting infestations of this sawfly on balsam fir (*Abies balsamea* [L.] Mill.). Moderate-to-heavy infestations recurred on immature balsam fir in a low-lying area along Highway 70 in Keppel Township. Elsewhere in the Owen Sound District, light-to-moderate infestations were common in Holland, Glenelg, Osprey and Artemesia townships.

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

There were minor fluctuations in population levels in 1981. Scots pine and jack pine (*Pinus banksiana* Lamb.) trees located in a 10 ha mixed pine stand near the junction of highways 73 and 401 in North Dorchester Township were moderately defoliated. Larval colonies were most common on

trees adjacent to the hydro line running through this plantation and destroyed approximately 20% of the old foliage. Elsewhere occasional colonies were common on ornamental mugho pine in Aylmer and St. Thomas, in a 20 ha stand of red pine in Minto Township, and north of the village of Wingham in Turnberry Township. Defoliation was negligible in all cases. In Owen Sound District, as in 1980, only a few colonies were observed at scattered locations.

White Pine Weevil, *Pissodes strobi* (Peck)

Except in one area, 1981 population levels of this insect on white pine were little different from those of 1980 (Table 1). The most notable damage occurred in a white pine plantation near Robson Lake in Holland Township, where 32% of the leading shoots were damaged. Light infestations were noted at several points in the Owen Sound District, near Normandale in Simcoe District, and in the Public Utilities Commission plantations near Woodstock in Aylmer District.

Table 1. Summary of leader damage by white pine weevil in three districts in 1980 and 1981 (counts based on the examination of 150 white pine trees at each location).

Location (Twp)	Avg ht of trees (m)	Stocking (trees/ ha)	Area affected (ha)	Leaders attacked (%)	
				1980	1981
Simcoe District					
Charlotteville	2.0	2,000	4	8.0	2.0
Charlotteville	9.0	3,000	1	7.3	3.3
Aylmer District					
Burford	3.0	3,000	5	-	2.6
Owen Sound District					
Holland	5.0	2,000	5	-	32.0

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

For the third consecutive year heavy infestations persisted in the St. Williams forestry complex along Highway 24 just west of the headquarters. Severe defoliation in small pockets of tamarack and European larch was common throughout the area. Elsewhere, heavy infestations persisted on open-growing trees along Highway 401 from Woodstock to London, particularly in

the vicinity of highways 73 and 401 in North Dorchester Township. Defoliation ranged upward to 60% in this area. High numbers of larvae were noted in West Oxford Township, Aylmer District and near Turkey Point, Simcoe District. In the Wingham, Chatham and Owen Sound districts, there were small isolated pockets of moderate-to-heavy infestations at widely separated points. The most notable of these was in Owen Sound District where tamarack in a 10 ha stand in Bruce Township suffered moderate-to-heavy defoliation. Light infestations were common at many points elsewhere in the Region.

European Pine Shoot Moth, *Rhyacionia buoliana* (Schiff.)

There was little change in the status of this insect in the Region in 1981. The light infestation that has persisted for many years in a 20 ha red pine plantation in Turnberry Township, Wingham District collapsed in 1981, with no current damage being observed. The heavy infestation reported in 1980 near Pearce Provincial Park changed little in 1981. Red pine trees in this 1 ha plantation are badly distorted as a result of past infestations. In the Owen Sound District, heavy damage recurred in a 4 ha red pine plantation south of Maxwell in Osprey Township, where most of the trees examined had varying degrees of damage. Elsewhere in the Region populations were generally low.

Spruce Bud Moth, *Zeiraphera canadensis* Mut. & Free.

As in 1980, severe damage to new shoots of white spruce (*Picea glauca* [Moench] Voss) and Norway spruce (*P. abies* [L.] Karst.) was common on hedgerows, seed trees and open-growing trees at several locations in the Region. Damage to windbreak and seed trees at the St. Williams Forest Station was heavy. During the first week of June spray operations were carried out at the above location. Sevin was applied in an attempt to control this infestation, but no appreciable larval mortality was noted. The insect was common in Zorra, Lobo and Malahide townships, Aylmer District; in Windham, Charlotteville and South Walsingham townships, Simcoe District; and in Minto, Colborne and Downie townships, Wingham District. Small numbers of larvae were noted at isolated locations in the Chatham and Owen Sound districts.

Minor Insects

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

Heavy infestations persisted at many points in the Chatham, Aylmer and Simcoe districts in 1981. As in the past few years, there were heavy infestations on roadside black walnut, hickories (*Carya* spp.) and butternut at many locations near Point Pelee National Park, Rondeau Provincial Park, along highways 3 and 401 and numerous secondary roads in the

southern part of the Chatham District. Defoliation ranged from 30% to 100%. In the Aylmer District, scattered heavy infestations were common along highways 3 and 401 near London, St. Thomas and Aylmer. Heavy infestations persisted on roadside and open-growing trees near St. Williams, Simcoe, Windham Centre and Delhi in the Simcoe District, with defoliation running upwards to 100% at several locations. Light infestations were common in the Grand Bend-Pinery area of Chatham District, and near Blyth in the Wingham District.

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

There were marked increases in the incidence of this pest on sugar maple (*Acer saccharum* Marsh.) at widely separated points in the Aylmer and Owen Sound districts in 1981. The most notable infestations occurred in a 68 ha stand of sugar maple in Pearce Provincial Park, Aylmer District and in the Sauble Beach-Sauble Falls area of Amabel Township, where 40 ha of immature sugar maple were moderately to severely defoliated. In the Aylmer District foliar damage averaged 40-50%, with many trees suffering up to 60% defoliation. Low levels of infestation were noted at many other points in the Owen Sound District.

Cottony Maple Scale, *Pulvinaria innumerabilis* (Rath.)

In 1980, the cottony maple scale, an important pest of shade tree maples, was found in large numbers over approximately 2,500 km^2 in the Windsor-Chatham area of the Region. However, populations collapsed in 1981, as expected, and little damage was observed in previously infested areas.

Redhumped Oakworm, *Symmerista canicosta* Francl.

In 1981 there was a marked increase in population levels of this late-feeding insect on red oak and white oak at several locations. In the Chatham District approximately 2,500 ha of red oak were moderately (up to 25%) defoliated in the Pinery Provincial Park-Grand Bend area of Bosanquet Township. In the Aylmer District, open-growing and ornamental oak trees in the Bayfield area were moderately to severely infested and defoliation of occasional trees was approximately 60-70%.

Orangehumped Mapleworm, *Symmerista leucitys* Francl.

Moderate numbers of this insect were found in a 40 ha sugar maple stand in the Sauble Beach-Sauble Falls area of Amabel Township, Owen Sound District. In many of these stands the trees were also infested with the maple trumpet skeletonizer. This combination of insects caused

upwards of 80% defoliation in this area. In the recent past these two insects feeding simultaneously on the same host have been reported from Michigan. Elsewhere in the Owen Sound District, low numbers of larvae were noted in adjacent townships, particularly in Albermarle, Lindsay, Keppel, Sarawak and Sydenham.

Table 2. Other forest insects.

Insect	Host(s)	Remarks
Acarina sp. Spider mites	wS	caused moderate reddening of needles of this host near Woodstock, Aylmer District
Aceria caulis (Cook) Velvet gall mite	walnut	caused moderate damage to leaf stalks of this host near Wheatley and Rondeau Provincial parks and Blenheim, Chatham District
Acleris variana (Fern.) Eastern blackheaded budworm	wS	light infestations common near Woodstock, Aylmer District and near Palmerston and St. Marys, Wingham District; defoliation negligible
Acrobasis demotella Grote A twig borer	walnut	small numbers near Pearce Provincial Park and near Wallacetown, Aylmer District
Acrobasis juglandis (LeBar.) Pecan leaf casebearer	walnut Hi Bu	small numbers near Paisley, Owen Sound District; found commonly at many points in the Chatham, Simcoe, Aylmer and Wingham districts
Adelges abietis (Linn.) Eastern spruce gall adelgid	wS	common on occasional trees near Woodstock, Aylmer District
Altica corni Woods Dogwood flea beetle	Do	heavy infestation in low-lying area in St. Vincent Twp, Owen Sound District

(continued)

Table 2. Other forest insects (continued).

Insect	Host(s)	Remarks
Anacampsis innocuella Zell. Darkheaded aspen leafroller	tA, lA	both species of aspen (*Populus* spp.) severely defoliated by this leafroller along the sixth concession of South Walsingham Twp, Simcoe District; small numbers along Highway 401 near London, Aylmer District
Archips cerasivoranus (Fitch) Uglynest caterpillar	cherry	heavy infestations scattered along roadsides at many points in the Region
Arge pectoralis (Leach) Birch sawfly	wB	small numbers of colonies in Sullivan Twp, Owen Sound District
Arge sp. A sawfly	rO	occasional colonies of this sawfly on fringe red oak near Turkey Point Provincial Park, Simcoe District
Callirhytis seminator (Harr.) Wool sower	wO	white oak seedlings moderately damaged by this insect at St. Williams Forest Station, Simcoe District
Caloptilia cuculipennella (Hbn.) Privet leafminer	wAs	all white ash (*Fraxinus americana* L.) trees in one compartment at St. Williams Forest Station infested by this insect
Cenopis pettitana (Rob.) Basswood leafroller	Ba	common but generally in low numbers near Kingsville in Point Pelee National Park and Rondeau Provincial Park, Chatham District; near Goderich, Wingham District; and on occasional trees near Pearce Provincial Park, Aylmer District
Coleophora laticornella Clem. Pecan cigar casebearer	sHi	caused moderate-to-severe defoliation of open-growing trees near Killworth, Aylmer District

(continued)

Table 2. Other forest insects (continued).

Insect	Host(s)	Remarks
Coleophora limosipenella Dup. Elm casebearer	wE	caused light-to-moderate defoliation of small roadside trees near Iona, Southwold Twp, Aylmer District
Datana ministra (Dru.) Yellownecked caterpillar	Ba	occasional trees severely defoliated along Highway 59 near Langton, Simcoe District
Dioryctria reniculelloides Mut. & Mun. Spruce coneworm	wS	Damage ranged from nil in Bruce Twp to 82% in St. Vincent Twp, Owen Sound District.
Diprion similis (Htg.) Introduced pine sawfly	wP	light populations common in Owen Sound District; found for the first time in Albermarle Twp, Owen Sound District
Epinotia nanana Treit. European spruce needleminer	wS	severe needle mining of white spruce in a 3 ha plantation near London, Aylmer District and in Colborne Twp, Wingham District
Eucordylea blastovora McLeod A spruce micro moth	wS	small numbers on occasional spruce in Wellington County forest in Minto Twp, Wingham District
Exartema nigranum Heinr. Basswood leafroller	sM	light infestation of this insect on scattered sugar maple near Blenheim and Wallacetown, Chatham District
Fenusa ulmi Sund. (Elm leafminer)	wE	moderate infestation on regeneration elm (*Ulmus* sp.) in Holland Twp, Owen Sound District

(continued)

Table 2. Other forest insects (continued).

Insect	Host(s)	Remarks
Halysidota tessellaris (J.E. Smith) Pale tussock moth	deciduous	common on numerous hosts in the Owen Sound-Wiarton area
Heterocampa manteo (Dbldy.) Variable oakleaf caterpillar	Ba, rO	moderate defoliation of basswood (*Tilia americana* L.) trees near Wheatley Provincial Park, Chatham District and at several points in Owen Sound District; small numbers of larvae on oak near Turkey Point Provincial Park, Simcoe District
Hydria prunivorata Ferg. Cherry scallopshell moth	bCh	heavy infestations of this leaf rolling insect at many points in St. Williams forestry complex; small numbers at many points in Owen Sound and Wingham districts
Malacosoma americanum F. Eastern tent caterpillar	cherry Haw	common throughout Region in varying degrees
Monochamus sp. Sawyer beetle	rP	light feeding damage by adults on red pine twigs near Sauble Falls, Owen Sound District
Neodiprion pratti banksianae Roh. Jack pine sawfly	jP	small numbers of larvae near junction of hwy 401 and 73, Aylmer District; defoliation less than 5%
Neuroterus quercusbatatus (Fitch) Oak potato gall	wO	caused heavy damage to white oak nursery stock in one compartment at St. Williams Forest Station
Nymphalis antiopa (L.) Mourningcloak butterfly	deciduous	common at many locations throughout Owen Sound District

(continued)

Table 2. Other forest insects (continued).

Insect	Host(s)	Remarks
Olethreutidae Micro moth	Walnut Bu	caused conspicuous damage to foliage of both species in the Owen Sound-Chatsworth area of Owen Sound District
Pikonema alaskensis (Roh.) Yellowheaded spruce sawfly	wS	light damage to ornamentals at many points in the Region
Pikonema dimmockii (Cress.) Greenheaded spruce sawfly	wS	small numbers near Palmerston, Wingham District
Pineus similis (Gill.) Ragged spruce gall adelgid	wS	common on this species near St. Williams, Simcoe District
Pristiphora geniculata (Htg.) Mountain-ash sawfly	Mo	moderate infestations near Stratford and Palmerston, Wingham District and near St. Williams, Simcoe District; moderate damage to ornamentals in city of Owen Sound
Pseudexentera sp. prob. *caryana* McD. Hickory leafroller	Hi	common but generally in low numbers near Killworth, Aylmer District
Pulicalvaria piceaella (Kft.) Orange spruce needle miner	wS	needle mining heavy near Woodstock and hwys 73 and 401, Aylmer District; near St. Williams, Simcoe District, and near Palmerston and Blyth, Wingham District (Most damage was noted on fringe trees.)
Rheumaptera hastata (Linn.) Spearmarked black moth	wB	trace levels in Owen Sound District
Rhyacionia adana Heinr. Pine tip moth	rP	red pine seedlings lightly damaged at St. Williams Forest Station, Simcoe District
Salebriaria engeli Dyar Oak leaftier	rO	small numbers near Normandale, Simcoe District

(continued)

Table 2. Other forest insects (concluded).

Insect	Host(s)	Remarks
Tetralopha expandens (Wlk.) Striped oak webworm	rO	small numbers in Turkey Point Provincial Park, Simcoe District
Yponomeuta cognatella Hbn. Euonymus moth	euonymus	common on ornamentals in city of Owen Sound

TREE DISEASES

Major Diseases

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

Light-to-moderate foliar damage by this tip blight on Scots pine and Austrian pine (*Pinus nigra* Arnold) was general throughout the Region in 1981. As in 1980, most damage was confined to hedgerows and open-growing trees, particularly along roadsides in the Simcoe, Owen Sound, Chatham, Aylmer and Wingham districts. Although no tree mortality was noted, tips and branches of host trees were badly damaged, and their commercial and aesthetic value was severely reduced in consequence.

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

For the past four years Scleroderris canker (European race) detection surveys have been carried out in southern Ontario. Red pine plantations were thoroughly examined at 15 locations in the Region. In addition, many more stands were checked visually as part of routine survey activities. No Scleroderris canker of either the North American or the European race has been found in the Region to date.

Horse Chestnut Leaf Blotch, *Guignardia aesculi* (Pk.) V.B. Stewart

In the Owen Sound District there was little change in levels of foliar damage caused by this leaf blotch in 1981. Heavy damage was common on ornamental horse chestnut (*Aesculus hippocustanum* L.) throughout the District. In the Simcoe District, only light damage levels were observed at any location that had heavy damage in 1980. Elsewhere, spotty damage to ornamental horse chestnut was common in many towns, cities and villages.

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

Although moderate-to-heavy foliar damage was noted at numerous points in the Region in 1981, damage was generally lighter than in 1980. Small clumps of ornamental sugar maple trees were moderately damaged in many areas of the Owen Sound District, particularly in the Owen Sound-Meaford area, where 25% of the trees were damaged (Table 3). In the Simcoe District, light damage was noted on understory sugar maple and on ornamentals in the town of Simcoe. Although the disease was common elsewhere in the Region, generally low damage levels prevailed.

Table 3. Summary of damage caused by leaf anthracnose of maple at two locations in 1981 (150 trees examined at each location).

Location (Twp)	Avg ht of trees (m)	Foliar damage (%)
Owen Sound District		
Saugeen	17	25
Derby	16	14

Poplar Leaf Disease, *Mycosphaerella populicola* G.E. Thomps.

This disease continued to cause early leaf fall and appreciable damage to about 100 ha of balsam poplar (*Populus balsamifera* L.) at several locations in the Bruce Peninsula in 1981. For the past several years the incidence of this leaf disease has been high at many points in the Bruce Peninsula and in scattered pockets of balsam poplar in Osprey and Proton townships in the Owen Sound District. Light damage levels were common at widely separated locations.

Brown-spot Disease, *Scirrhia acicola* (Dearn.) Siggers

This disease on mugho pine was first detected in Ontario in the fall of 1980 by personnel of the Ontario Ministry of Natural Resources (OMNR) in the Sauble Falls area of the Bruce Peninsula. A follow-up survey was carried out in the spring of 1981 and the disease was found to be more widespread, as Austrian pine in the same general area was also infected. Sanitation measures were carried out, and for the present, the fungus seems to be contained in the initial area of infection. Additional surveys, adjacent to Sauble Falls, failed to reveal the presence of this disease. Damage which appeared similar to that caused by brown-spot disease was found on Austrian pine in the Chief's Point Tract 2 km from Sauble Falls. This damage was found to be due to *Dothiostroma pini* Hulbary, which has been known to cause appreciable damage in other plantations of Austrian pine.

Dothistroma Needle Blight, *Scirrhia pini* Funk & A.K. Parker

This needle disease was responsible for serious needle damage on Austrian pine near Dornoch in Glenelg Township, Owen Sound District. The disease was first recorded from the above area in 1979 and since then has been found on Austrian pine near Sauble Falls in the Bruce Peninsula,

where there was considerable foliar damage in 1981. In 1982 extensive surveys will be carried out in the Region to see if the disease is localized or widespread.

Table 4. Other forest diseases.

Organism	Host(s)	Remarks
Apiosporina morbosa (Schw.) Arx Black knot	cherry	heavy infection on open-growing trees at many points
Arceuthobium pusillum Pk. Eastern dwarf mistletoe	bS	common in St. Edmunds Twp, Owen Sound District
Armillaria mellea (Vahl ex Fr.) Kumm. Armillaria root rot	rP, wS	common throughout the Region in varying degrees of infection
Cronartium quercuum (Berk.) Miy. ex Shirai Eastern gall rust	scP	heavy infection on understory trees in St. Williams Forest Station near Turkey Point, Simcoe District
Gnomonia leptostyla (Fr.) Ces. & de N. Leaf anthracnose	Bu, bWa	common on these two hosts at many points in the southern part of the Region
Leucostoma kunzei (Fr.) Munk ex Kern Cytospora canker	blS	heavy infection on ornamentals in towns of Aylmer and Tillsonburg, Aylmer District and Simcoe, Simcoe District
Marssonina brunnea (Ell. & Ev.) Magn. Leaf anthracnose	tA, cPo	common on Carolina poplar (*Populus canadensis* Moench) in one compartment at the St. Williams Forest Station, Simcoe District and on trembling aspen (*Populus tremuloides* Michx.) near Wingham
Mycosphaerella populorum G.E. Thomps. Leaf blotch	cPo	moderate damage to leaves of this species in Point Pelee National Park, Chatham District

(continued)

Table 4. Other forest diseases (concluded).

Organism	Host(s)	Remarks
Phyllosticta minima (Berk. & Curt.) Underw. & Earle Leaf spot	siM	common on ornamentals near Waterford, Simcoe District
Tubakia dryina (Sacc.) Sutt. Leaf spot disease	rO	common on small red oak trees in Rondeau Provincial Park, Chatham District; overstory trees lightly infected
Venturia inaequalis (Cke.) Wint. Apple scab	apple	common on ornamental trees in towns of Aylmer, Delhi and Simcoe

Diebacks and Declines

Ash Dieback

As in previous years, this dieback condition on ash continued to cause much conern to property owners at many points in the Region. It is characterized by branch mortality which progresses through crowns, often killing trees. High damage levels were common at many points in 1981 and frequently the affected trees died. The cause of this dieback is as yet undetermined.

Maple Decline and Sapstreak Disease, *Ceratocystis coerulescens* [Munch] Bak.

This condition, characterized by upper crown dieback, continues to cause concern to property owners, conservation authorities, and OMNR personnel. In 1981 surveys were carried out in several sugar maple woodlots to try to determine whether sapstreak disease was present. Numerous cores and discs were submitted from several widely separated locations, but no evidence of sapstreak was noted. Primary fungi such as the trunk rots *Daedalea unicolor* Bull. ex Fr. and *Corticium vellereum* Ell. & Cragin were isolated in culture. These two fungi were collected from trees located in the town of Norwich, Aylmer District and in the Maple Keys sugar maple bush near Listowel, Wingham District. The incidence of infection in both cases was trace. Bacterial infection was common in Blandford Township and Wawanosh East Township. This survey for sapstreak will continue in 1982.

Oak Decline

For the past five years, three plots of red oak and white oak in the Simcoe and Chatham districts have been monitored for oak decline. Since 1977 oak decline has been gradual in the plots in Charlotteville and Bosanquet townships; however, in South Walsingham Township tree decline was more pronounced. Since 1977, 9% of the trees have died compared with 0% and 1% in the other two townships (Table 5). Initially, the plots were to be visited for five consecutive years and the accumulated data were to be analyzed at this time. It has now been decided to continue to monitor these plots for one to three additional years.

Table 5. Summary of oak decline at three locations in the Region (100 red oak and white oak trees examined at each location).

Location (Twp)	Avg DBH of sample trees (cm)	Area affected (ha)	Year	Crown class[a] 0	1	2	3	4	5
Simcoe District									
Charlotteville	32	315	1977	-	70	8	12	10	0
			1978	-	69	9	10	12	0
			1979	14	44	14	19	8	1
			1980	5	24	37	25	8	1
			1981	2	23	41	30	3	1
South Walsingham	22	150	1977	-	42	35	18	5	0
			1978	-	40	33	19	4	4
			1979	0	36	38	16	3	6
			1980	0	29	38	22	5	6
			1981	0	19	41	29	1	9
Chatham District									
Bosanquet (Pinery Provincial Park)	29	2,542	1977	-	69	7	17	7	0
			1978	-	69	7	17	7	0
			1979	0	68	11	16	5	0
			1980	0	53	19	21	7	0
			1981	0	48	24	21	7	0

[a] Oak decline is principally branch mortality.

0 - healthy
1 - 6-20%
2 - 21-40%
3 - 41-60%
4 - 61+%
5 - dead

Abiotic Damage

Frost Damage

Unseasonably warm weather in mid-to-late April, followed by cold weather in May, caused moderate frost damage to trees of numerous species in the eastern part of the Simcoe District and at scattered locations in the Owen Sound and Wingham districts. The most significant damage to coniferous trees was in a 1.5 ha white spruce plantation in Bruce Township, Owen Sound District, where 63% of the trees were damaged. In the Wingham District light-to-moderate damage occurred on white spruce in the Dr. Murray plantations in Downie Township (Table 6). Light frost damage was common in Caradoc, West Nissouri and Zorra townships, Aylmer District and in St. Vincent Township, Owen Sound District.

Table 6. Summary of damage caused by frost on white spruce at eight locations in 1981 (150 trees examined at each location).

Location (Twp)	Avg ht of trees (m)	Trees per ha	Area affected (ha)	Trees damaged (%)	Foliar damage (%)
Aylmer District					
Caradoc	2	3,500	6	12	1
West Nissouri	4	5,000	2	9	1
Zorra	1	6,000	5	20	1
Owen Sound District					
Bruce	1.5	1,667	3	63	5
St. Vincent	5	700	8	3	1
Simcoe District					
South Walsingham	20	2,400	25	0	0
Wingham District					
Downie	3	4,000	25	25	5
Minto	11	4,000	40	0	0

Salt Damage

This perennial problem once again caused severe damage to many species of roadside trees, particularly in areas with high traffic density. Heavy salt application along major highways in the Aylmer, Owen Sound, Simcoe and Chatham districts caused heavy damage to white pine and cedar at many points. White pine appeared to be particularly susceptible in a 6 ha stand along Highway 10 in Holland Township, Owen Sound District. Upon investigation, it was found that damage from salt spray can extend for some distance from the nearest application. In this area foliar damage was evident in a diminishing fashion for a distance of approximately 150 m from the roadside. The problem was common in varying degrees at several other locations as well.

Winter Drying

This condition was common at several locations in the Region in 1981. Low snow cover exposed white pine and Scots pine trees to bright sunlight in late winter and trees with a southern and western exposure were moderately damaged by this condition. The most notable damage occurred in a 1 ha stand of white pine near the village of Langton, where 90% of the trees had varying degrees of damage. Except for some needle drop, trees showed little damage. Light levels of damage were common elsewhere in the Region.

Special Surveys

White Spruce Plantation Survey

For the past three years special pest surveys have been conducted in high-value situations for specific tree species, i.e., red pine, white pine and, in 1981, white spruce. Three plantations of trees 0-2 m high, three plantations of trees 2-6 m high and two plantations of trees 6 m high were sampled. These plantations were selected randomly in Simcoe, Aylmer, Wingham and Owen Sound districts. The surveys were designed to provide information on the species of pests present in white spruce plantations and their impact. Two visits were made, one on 15 June and the other on 17 July.

In 1981 the most important insects were expected to be spruce budworm, spruce coneworm, spruce shootworms, white pine weevil, yellowheaded spruce sawfly and miscellaneous insects. With the exception of spruce budworm, spruce coneworm and spruce shootworms, little or no damage was caused by yellowheaded spruce sawfly, white pine weevil and miscellaneous insects. Tree diseases considered important were: needle rusts, cone rust, and Armillaria root rot. Nutritional deficiencies such as needle chlorosis, and abiotic conditions such as ice and storm

Table 7. Summary of the results of a white spruce plantation survey at eight locations in the Southwestern Region in 1981 (150 trees examined at each location).

Location (Twp)	Area (ha)	Estimated trees per ha	Avg ht of trees (m)	Percentage of trees affected by: spruce budworm	spruce shootworm	spruce coneworm	Avg percent defoliation by spruce budworm and spruce coneworm	Yellowheaded spruce sawfly: trees affected (%)	Yellowheaded spruce sawfly: defoliation (%)	Armillaria root rot: percentage of trees affected	Chlorosis	Frost: trees affected (%)	Frost: defoliation (%)
Owen Sound District													
Bruce	3	1,700	1.4	22	0	0	1	0	0	1	absent	63	5
St. Vincent	8	700	5.1	82	97	82	6.5	0	0	0	absent	3	1
Aylmer District													
West Nissouri	2	4,000	4.2	0	100	0	0.0	0	0	0	present	7	1
Caradoc	6	4,500	1.8	0	9	0	0.0	0	0	0	present	12	1
Zorra	5	3,500	1.3	0	4	0	0.0	0	0	0	absent	20	1
Simcoe District													
South Walsingham	25	3,000	22.8	1.5	2	0	2	0	0	0	absent	0	0
Wingham District													
Minto	40	4,000	11.7	100	present	100	34	present	trace	0	present	0	0
Downie	25	4,000	3.1	0	4.6	0	0	1	trace	0	present	28	5

damage and frost, were also surveyed. Although all the preceding are important problems, only needle chlorosis and frost were found in the plantations inspected. No evidence of needle rusts or Armillaria root rot was noted.

A summary of the results of the white spruce plantation surveys is given in Table 7.

Seed and Cone Pests of White Spruce

Recently concern has been expressed by foresters and others about losses in seed production as a result of insects and diseases. In 1981, white spruce was selected for sampling and surveys were carried out at the provincial level to assess damage caused by cone and seed insects and disease (Table 8). The sampling method used was to select three white spruce trees in a seed production area. One collection of 200 female flowers or early developing cones was made on 28 May and a follow-up collection of developed cones was made on 20 August.

Table 8. Summary of damage caused by a complex of cone and seed insects on hedgerow seed trees at the St. Williams Forest Station in 1981.

Location	No. of ♀ flowers examined	No. of ♀ flowers damaged	No. of cones examined	% cones damaged	% damaged by	
					Lepidoptera	Other insects
St. Williams	205	22	100	84	35	49

The flowers were found to be relatively free of insect damage. Although 22% of the flowers were infested by different species of Lepidopterous larvae, only 1% were heavily damaged. Other insects identified from this collection of flowers, but causing little damage, were the spruce bud moth and eggs of the spruce cone maggot (*Hylemya anthracina* [Czerny]).

The developed cones were more heavily damaged: upon examination it was found that only 16% of the cones were sound, compared with 78% of the flowers. The insects found causing either appreciable or minor damage were the spruce cone gall midge (*Dasineura canadensis* Felt), a conifer micro moth (*Holocera immaculella* McD.), the spruce cone

maggot, several species of unidentified Lepidoptera[1], the spruce seed chalcid (*Megastigmus atedius* Walker), a spruce micro moth (*Paralobesia piceana* Free.) and the orange spruce needle miner (*Pulicalvaria piceaella* [Kft.]). Over 60% of the cone damage was caused by the unidentified Lepidoptera and the spruce cone maggot.

No evidence of disease-caused damage was detected in either sample.

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[1] As the feeding cycle was complete at the time of collection, it was not possible to identify genus and species.