

1966

Information Report No.	Subject	Author
O-X-34	Forest Insect & Disease Surveys	
	--Lindsay District	W. J. Miller
O-X-35	--Tweed District	F. Livesey
O-X-36	--Kemptville District	J. Hook
O-X-37	--Pembroke District	R. A. Trieselmann
O-X-38	--Lake Simcoe District	A. A. Harnden
O-X-39	--Lake Huron District	R. L. Bowser
O-X-40	--Lake Erie District	J. R. Trinnell
O-X-41	--North Bay District	L. S. MacLeod
O-X-42	--Parry Sound District	C. A. Barnes
O-X-43	--Sault Ste. Marie District	H. G. McPhee
O-X-44	--Sudbury District	J. R. McPhee
O-X-45	--Chapleau District	D. Ropke
O-X-46	--Gogama District	W. Ingram
O-X-47	--White River District	D. C. Constable
O-X-48	--Cochrane District	H. R. Foster
O-X-49	--Kapuskasing District	G. T. Atkinson
O-X-50	--Swastika District	M. J. Applejohn
O-X-51	--Port Arthur District	K. C. Hall
O-X-52	--Geraldton District	V. Jansons
O-X-53	--Sioux Lookout District	P. E. Buchan
O-X-54	--Kenora District	H. J. Weir
O-X-55	--Fort Francis District	M. J. Thomson

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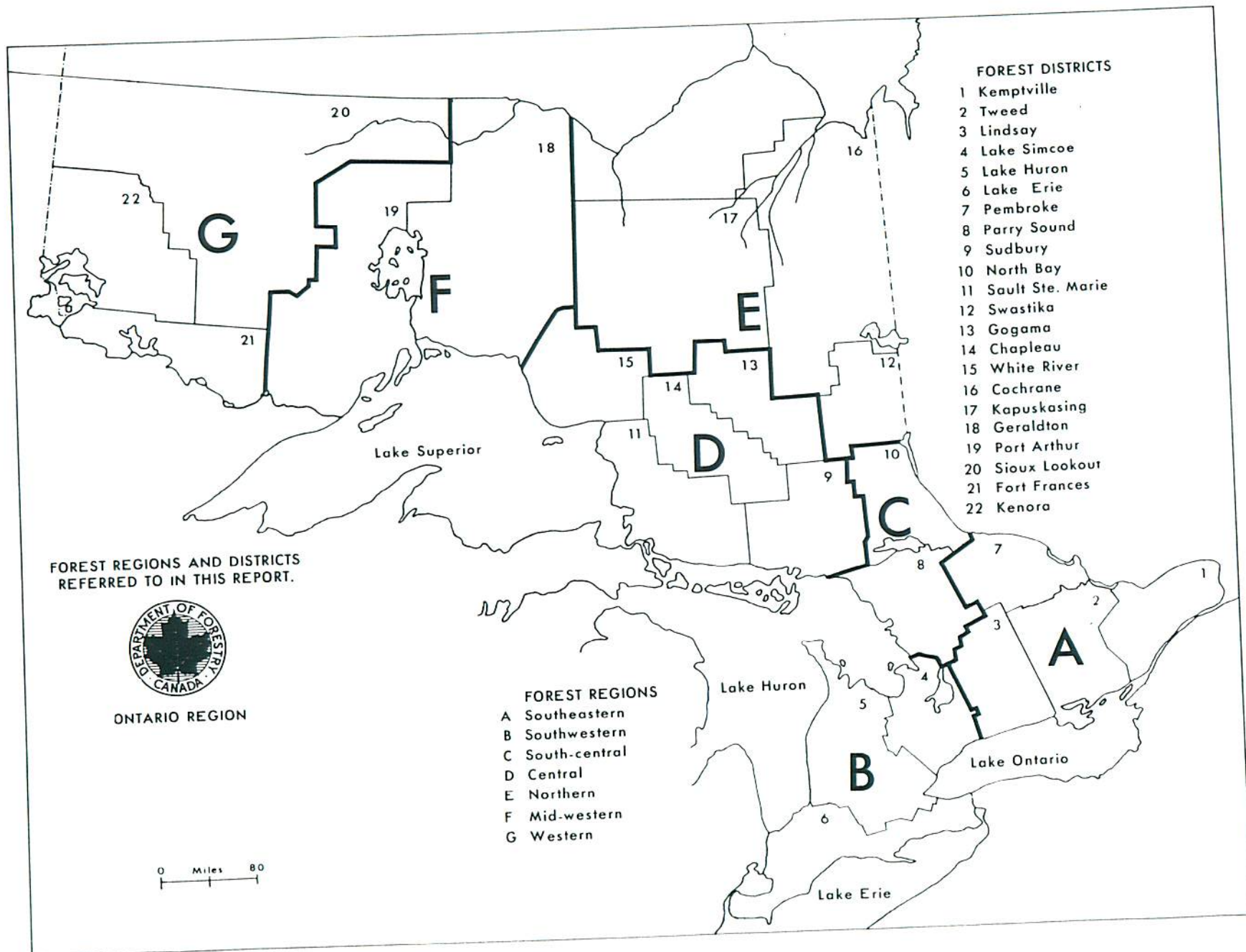
Southeastern forest
region, 1966 / [by] W. J.
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TABLE OF CONTENTS
 REPORTS OF FOREST RESEARCH TECHNICIANS

Ontario	Page
Foreword, J. E. MacDonald	
A. <u>SOUTHEASTERN FOREST REGION</u>	<u>A1-56</u>
Lindsay District, Wm. J. Miller *	A 9
Tweed District, F. Livesey	A 22
Kemptville District, J. Hook	A 34
Pembroke District, R. Trieselmann	A 43
B. <u>SOUTHWESTERN FOREST REGION</u>	<u>B1-47</u>
Lake Simcoe District, A. A. Harnden*	B 15
Lake Huron District, R. L. Bowser	B 27
Lake Erie District, J. R. Trinnell	B 39
C. <u>SOUTH-CENTRAL FOREST REGION</u>	<u>C1-30</u>
North Bay District, L. S. MacLeod*	C 7
Parry Sound District, C. A. Barnes	C 18
D. <u>CENTRAL FOREST REGION</u>	<u>D1-56</u>
Sault Ste. Marie District, H. G. McPhee*	D 11
Sudbury District, J. R. McPhee	D 19
Chapleau District, Deter Ropke	D 29
Gogama District, W. Ingram	D 39
White River District, D. C. Constable	D 48
E. <u>NORTHERN FOREST REGION</u>	<u>E1-41</u>
Cochrane District, H. R. Foster*	E 9
Kapusking District, G. T. Atkinson	E 23
Swastika District, M. J. Applejohn	E 30
F. <u>MIDWESTERN FOREST REGION</u>	<u>F1-26</u>
Port Arthur District, K. C. Hall*	F 8
Geraldton District, V. Jansons	F 18
G. <u>WESTERN FOREST REGION</u>	<u>G1-44</u>
Sioux Lookout District, F. E. Buchan*	G 12
Kenora District, Harvey J. Weir	G 27
Fort Frances District, M. J. Thomson	G 37

Photographs

* Regional Supervisors



FOREWORD

J. E. MacDonald

A prolonged period of drought, extending from May until August, seriously affected the growth and survival of forest stands on shallow sites and in plantations, particularly in central and southern Ontario. This was evidenced in August when hardwoods on rocky sites in many areas turned brown and shed their foliage. Serious losses of conifers planted in 1966 were reported in the Sault Ste. Marie, Lake Huron, Lake Simcoe and Lindsay districts.

Intensive surveys were carried out in 1966 to determine the distribution and incidence of Scleroderris canker of pine and of Dutch elm disease. These revealed that Scleroderris canker is widely distributed in northern Ontario. Incidence and tree mortality was highest in young red and jack pine plantations, however, significant losses of jack pine reproduction were also observed in several areas. Incidence of the disease was low in southern Ontario. Dutch elm disease is well established throughout southern Ontario and in localized areas in North Bay and Sudbury districts in northern Ontario. The incidence of infection was particularly high in the Toronto, London and Windsor areas. Over 50 per cent of the elm trees in many areas in southwestern Ontario were infected and the disease has taken a heavy toll of trees in older areas of infection.

Noteworthy changes in the extent and intensity of infestations of the forest tent caterpillar and jack pine budworm occurred in 1966. Weather conditions in the spring brought about a collapse of the forest tent caterpillar outbreak that had occurred over a vast area in Sioux Lookout, Kenora and Port Arthur districts in recent years. Heavy infestations persisted in Fort Frances District and in numerous areas in central and southeastern Ontario, but no outstanding changes in their extent and intensity occurred. Forest tent caterpillar defoliation forecasts for 1967 are contained in the district reports that follow.

Jack pine budworm infestations were reported in three widely-separated parts of Ontario. The largest of these occurred in the western part of Fort Frances and Kenora districts. Pockets of infestation occurred in the southern part of Sault Ste. Marie District and on Manitoulin Island.

The European pine sawfly continued to be a serious pest in pine plantations in southern Ontario. Since its discovery in a Scots pine plantation on Manitoulin Island in 1965, it has been found in five additional plantations on the Island. The results of control measures using virus sprays to contain the sawfly in this northern location will be followed with interest in 1967.

Expansion of the forest research program of the Department of Forestry and Rural Development in Sault Ste. Marie and the establishment of new positions in the Insect and Disease Survey Section has resulted in many changes of duties for Survey technicians. Five new district technicians will be required for the 1967 field season and numerous district re-assignments will be made. A list of technicians and their district assignments will be issued to key personnel of the Department of Lands and Forests and Industry early in the field season.

SOUTHEASTERN FOREST REGION

1966

INTRODUCTION

STATUS OF TREE DISEASES (Regional)

		Page
Dutch Elm Disease.....	<u>Ceratocystis ulmi</u> (Buism.) C. Moreau	A 1
Ink Spot of Aspen.....	<u>Ciborina whetzeli</u> (Seav.) Seav.	A 1
White Pine Blister Rust.....	<u>Cronartium ribicola</u> J. C. Fischer	A 1
Twig Blight.....	<u>Cytospora kunzei</u> Sacc.	A 2
Black-knot of Cherry.....	<u>Dibotryon morbosum</u> (Schw.) Theiss. & Syd.	A 2
Fomes Root Rot.....	<u>Fomes annosus</u> (Fr.) Cke.	A 2
Red Ring Rot of Conifers.....	<u>Fomes pini</u> (Thore ex Pers.) Lloyd	A 2
Leaf and Twig Blight of Poplar.....	<u>Pollacia radiosa</u> (Lib.) Bald. & Cif.	A 2
Die-back of Pines.....	<u>Schleroderris lagerbergii</u> Gremmen	A 3
A Needle Droop Condition on Red Pine.....		A 3
Drought Injury.....		A 4
Maple Deterioration.....		A 4
Oak Deterioration.....		A 5
Table of Other Noteworthy Diseases.....		A 5

INTRODUCTION

Southeastern Forest Region

The forest insects that in 1966 constituted major problems in the Southeastern Forest Region were: the forest tent caterpillar, the European pine sawfly and the red-headed pine sawfly. Infestations of forest tent caterpillar persisted in Pembroke and Tweed districts but increased in extent in Kemptville District. Infestations of the European pine sawfly increased slightly in Lindsay and Tweed districts. A new distribution record of the sawfly was established with the finding of the insect in a Scots pine plantation in Prince Edward County, Tweed District. Populations of the red-headed pine sawfly increased in all districts.

Mortality to pine plantations caused by the engraver beetle occurred at scattered locations in Lindsay District. A jack-pine sawfly, Neodiprion pratti paradoxicus Ross was found on pitch pine in the southern part of Kemptville District.

Severe drought in mid-summer caused many species of trees on ridges and in well drained areas to have their foliage die and fall prematurely. A deterioration condition of red pine occurred at scattered locations in the region. In Lindsay District, considerable mortality of young trees in plantations resulted.

Insect collections in the region in 1966 totalled 1122. Samples of tree diseases submitted to the Forest Pathology Laboratory totalled 351. Twenty-three special insect collections were made for parasite studies and various research projects. In co-operation with staff members of Atomic Energy of Canada Limited large numbers of red-headed pine sawflies were collected in Haliburton and Victoria counties.

The number of extension and service calls dealt with in 1966 was 230, compared with 157 in 1965.

W. J. Miller

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

Infections by C. ulmi continued throughout the Southeastern Forest Region in 1966. Incidence of the disease increased in 1966 compared with 1965, while tree mortality remained approximately the same. It is probable that the mortality of elms is higher than quantitative samples indicate because mortality figures are influenced by the removal of trees soon after mortality occurs.

Quantitative samples taken at 110 scattered locations in the Region revealed that incidence of the disease varied from 6 to 30 per cent and mortality from 5 to 18 per cent.

TABLE 1

Summary of the Occurrence of Dutch Elm Disease and of the Mortality in the Southeastern Region in 1966

District	No. of locations sampled	No. of trees examined	Per cent of trees diseased	Per cent of trees dead
Lindsay	32	2500	16	18
Tweed	29	1450	10	17
Kemptville	27	3975	6	5
Pembroke	22	716	30	6

Ink Spot of Aspen, Ciborina whetzellii (Seav.) Seav.

Incidence of the ink spot of aspen was heavy in three small areas in Harvey, Harcourt, and Clarke townships in Lindsay District. Light infections occurred in small pockets in Cambridge Township, Kemptville District; Sproule, Preston, Airy and Murchinson townships in Pembroke District; between Dacre and Calabogie in Tweed District; and in Methuen, Lutterworth and Somerville townships in Lindsay District. Occasional light infection occurred at scattered locations in the rest of the Region. A small area of very light infection occurred on Carolina poplar in Lutterworth Township.

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

The status of this important pathogen was unchanged in the Southeastern Region in 1966. In Lindsay District a small area of 12-foot trees suffered 14 per cent infection and 14 per cent mortality. In Westmeath Township, Pembroke District, 32 per cent of the trees in a young white pine plantation were infected and 27 per cent were killed. Numerous shade trees in the town of Deep River were infected, and heavy mortality of regeneration was observed at one location in Wylie Township.

Highest incidence of infection in Kemptville District occurred at a sample point in Torbolton Township, where 10 per cent of the white pine were infected. The disease was observed commonly in Tweed District on white pine of all age classes.

Twig Blight, Cytospora kunzei Sacc.

Infection of spruce by this fungus occurred at four locations in the Region: two in Lindsay District, and one in each of Pembroke and Kemptville districts. In Lindsay District, an infection centre was observed on a Norway spruce fence-row in Ops Township, where heavy damage occurred. A second was on a Norway spruce fence-row in Manvers Township; of 100 trees examined 36 were dead and 25 showed symptoms of the disease. In Pembroke District the pathogen caused numerous stem cankers in a white spruce plantation at the Petawawa Forest Experimental Station. Of 126 trees checked in the plot, 11 were dead and 66 showed symptoms of the disease. In Kemptville District severe infection occurred in a 30-year-old white spruce plantation in the Larose Forest in Cambridge Township.

Black-knot of Cherry, Dibotryon morbosum (Schw.) Theiss. & Syd.

The black-knot disease of cherry, caused by D. morbosum is found throughout the Region in most areas where wild cherry or plum trees occur. Incidence and severity of the disease are generally low to medium. However, numerous centres of heavy infection were observed in Haliburton, Durham and Northumberland counties in the Lindsay District; near Cloyne, Slate Falls, and west of Maynooth in the Tweed District; and in Clara, Hagarty, Richards and Wilberforce townships in the Pembroke District.

Fomes Root Rot, Fomes annosus (Fries.) Cooke

Severe root rot caused by F. annosus occurred in six areas in the Region in 1966. Five of these occurred in red and jack pine plantations in the Northumberland County Forest, Lindsay District. The other pocket of infection occurred in a red pine plantation of six to twelve inch d.b.h. trees in a plantation in Cartwright Township, Durham County. The area of mortality in this instance is approximately 100 feet in diameter. The infected plantation that was found in the Northumberland County Forest in 1965 was clear cut in 1966.

Red Ring Rot of Conifers, Fomes pini (Thore ex Pers.) Lloyd

A root-exposure experiment was carried out at the Petawawa Forest Experiment Station in a 39-year-old white spruce plantation. Of twenty-five completely exposed root systems, five contained a high percentage of dead roots and roots showing cracks and heavy resinosis. The butts, to a height of three feet above the ground, showed interior rotting. The causal agent of this damage was identified as Fomes pini. The external appearance of the visible parts of the trees in this plantation appeared normal.

Leaf and Twig Blight of Poplar, Pollacia radiosa (Lib.) Bald. & Cif.

Centres of infection by this shoot blight of trembling aspen were again commonly observed in all districts of the Region. Incidence and severity were generally light and no trees above regeneration size were infected. Centres of heavy infection were observed in Abinger and Raglan townships in the Tweed District; Bathurst, Marlborough, Mountain, Oxford,

and S. Sherbrooke townships in the Kemptville District; and Stratton and Peck townships in the Pembroke District, where 39 and 47 per cent respectively of trembling aspen were severely infected.

Die-back of Pines, Scleroderris lagerbergii Gremmen

In the Kemptville District, this fungus caused heavy mortality of transplanted white pine stock in the Department of Lands and Forests nursery in Oxford Township.

Light mortality of planting stock, obtained outside the district, occurred in four widely-scattered red pine plantations in Alice, Guthrie, Hagarty, and Murchison townships in the Pembroke District (Table 2). The disease was not observed in the Lindsay and Tweed districts.

TABLE 2

Incidence of Scleroderris lagerbergii in Four Red Pine Plantations in the Pembroke District in 1966

Township	Year planted	No. of trees checked	No. of dead seedlings	Per cent dead
Alice	1962	750	2	.3
Guthrie	1965	750	17	2.3
Hagarty	1965	750	12	1.6
Murchison	1965	750	7	.9

A Needle Droop Condition on Red Pine

A needle droop condition caused by an unknown agent occurred in the Southeastern Forest Region in 1966. Severe damage occurred in seven plantations in Lindsay District, three in Tweed District, and in one in Pembroke District (see map). The incidence of infection was highest in Minden Township, where 99 per cent of the trees were damaged and 57 per cent were killed; in Stanhope Township where 86 per cent were damaged and 28 per cent were killed; and in Mayo Township where most of the trees in a plantation were damaged but few were killed. In many plantations losses necessitated replanting programs.

In September 1965 severe damage, noted in a red pine plantation in Lindsay District, was confined to the current year's foliage and consisted of brown shrunken areas on those portions of needles within needle sheaths. The needle at this point drooped at an acute angle giving the foliage a pyramid-shaped appearance (see photograph). In late September and in October the foliage became brown and in many instances the buds at the end of the affected shoots died. In some areas the condition occurred later in the year and the foliage remained green until the following spring. Consequently most of the damaged areas reported in 1966 were the result of conditions initiated in 1965. The damage was noted in plantations of red pine from 8 inches high to plantations of 12-foot high trees. In general, trees 18 inches or more in height survived while most trees under that height died. In every instance where the injury was noted in 1965, the mite Setoptus jonesi (Keifer) was usually present in the sheath at or near the constricted portion of the needle. In the spring of 1966 the mite was again observed on the foliage, not

closely associated with the damaged needles of the 1965 growth, but usually associated with the 1964 foliage. Numerous trees with the same injury to the 1966 foliage were closely examined in September without finding any mites on any part of the trees. This seems at the moment to preclude the possibility that S. jonesi is responsible for the condition.

Samples from all parts of injured trees were submitted to the Forest Pathology at Maple at various times. In one plantation in Lindsay District cankers were found frequently on the trunks of trees, but they were not found consistently with the condition in other plantations and cannot be considered to be the cause of the damage. Other fungi occasionally associated with this needle droop condition were: Sclerophoma pithyophila, Aureobasidium pullulans, (de Bary) Arnaud, Cenangium ferruginosum, Valsa sp., Cytospora sp., Phoma sp.

Drought Injury

Drought conditions prevailed from late June until early August in the Region, and many tree species growing in shallow soil, rocky ridges or in other well drained areas, suffered severely. In the central parts of Lindsay and Tweed districts and in the vicinity of petawawa in Pembroke District. The foliage of oak, maple, birch, and most other species of deciduous trees died in early summer. Scattered young balsam fir and red pine growing on rocky ridges in the northern parts of Victoria and Peterborough counties and small white pine in plantations in Tweed District were killed. Less severe damage occurred at scattered locations in the rest of the Region.

Maple Deterioration

Roadside deterioration was severe throughout Lindsay, Tweed, and Kemptville districts. Tree mortality is low, even though the condition has persisted for several years and incidence level has been high (Table 3).

TABLE 3

Summary of the Occurrence of Deterioration and Mortality to Sugar Maple Trees in the Southeastern Region in 1966

Location by Township	No. of trees examined	Per cent of trees damaged	Per cent of trees dead
<u>Lindsay District</u>			
Asphodel	33	14	4
Cavan	100	26	1
Darlington	50	20	4
Hamilton	25	36	0
Hope	17	30	6
Mariposa	50	19	0
Ops	50	47	0
Otanabee	50	24	0
Seymour	50	14	0
Fenelon	34	8	2

TABLE 3 (concluded)

Location by Township	No. of trees examined	Per cent of trees damaged	Per cent of trees dead
<u>Kemptville District</u>			
Finch	50	6	2
Lanark	50	14	4
Osgoode	50	2	0
Oxford	50	4	2
Ramsay	50	16	0
<u>Tweed District</u>			
Hungerford	50	24	0
Rawdon	50	36	2
Sydney	50	24	4
Thurlow	50	20	0

NOTE: Trees examined ranged from 9" to 24" in diameter.

Oak Deterioration

Oak deterioration has increased for the past five years in Lindsay District. High incidence of this condition occurred in the southern half of the district and light incidence in the northern half in 1966. The areas of heaviest damage were in the Durham County Forest where numerous oaks had discoloured foliage and branch mortality. In one part of the forest, mortality of large trees was ten per cent. This condition was also recorded in Northumberland County.

TABLE 4

Other Noteworthy Diseases in the Southeastern Region in 1966

Organism	Host(s)	Remarks
<i>Apiosporina collinsii</i> (Schw.) Hoehn.	Se	Occasional large shrubs in Rolph Twp. infested, Pembroke District.
<i>Arceuthobium pusillum</i> Pk.	bS	Small centre of infection in Chandos and Burleigh twps., Lindsay District.
<i>Armillaria mellea</i> (Vahl ex F.) Kummer	Hi, rP wP, wS	Small centres of light infection at scattered points in the Region.
<i>Aureobasidium pullulans</i> (de Bary) Arnaud	rP, scP	Infections of high severity on red pine and low severity on Scots pine in plantations in Minden Twp.
<i>Coryneum negundinis</i> Berk. & Curt.	mM	Lightly infected Manitoba maple at scattered locations in Lindsay District.

TABLE 4 (continued)

Organism	Host(s)	Remarks
<i>Cytospora chrysosperma</i> (Pers.) Fr.	W, cPo	Increased incidence in Lindsay and Tweed districts, centre of heavy infection at Belleville.
<i>Dothichiza populea</i> Sacc. & Braird	cPo, wPo	Low incidence on ornamentals in Cramahe and Hope twps. in Lindsay District.
<i>Fomes igniarius</i> (L. ex Fr.) Gill.	Be, sM	Several small centres of infection throughout Lindsay District, one large centre of infection in Pembroke District.
<i>Gnomonia ulmea</i> (Schw.) Thuem.	wE	High incidence, low severity on white elm in Hagarty Twp., Pembroke District.
Frost injury	Hardwoods & Conifers	Night frosts late in the season caused injury to developing shoots at many points in the Pembroke District. Most noticeable on hardwoods in Finlayson, Peck and Canisbay twps.
<i>Gymnosporangium juniperi- virginianae</i> Schw.	rJ	Centres of heavy infection throughout southern part of Tweed District, small centres of infection in S. Crosby and Front-of-Yonge twps. in Kemptville District.
<i>Hypodermella ampla</i> (J. J. Davis) Dearn.	jP	Numerous small centres of light infection in Pembroke District.
<i>Hypoxyton mammatum</i> (Wahl.) Miller	tA	Occurs at numerous locations in the Region. Several centres of severe infection in Pembroke District; at one location in Haldimand Twp. in Lindsay District, 5 per cent of the trees examined were infected, and 5 per cent were dead.
<i>Lophodermium pinastri</i> (Schrad.) Chev.	jP	Small centre of severe infection in Clara Twp., Pembroke District.
<i>Macrophoma tumefaciens</i> Shear	tA	Seventy-five per cent trees infected in Buchanan Twp., Pembroke District.

TABLE 4 (continued)

Organism	Host(s)	Remarks
<i>Melampsora abietis</i> - <i>canadensis</i> Ludwig. ex Arth.	eH	Small centres of light infection in Cambridge and Mountain twps., Kemptville District.
<i>Melampsora medusae</i> Thuem.	tL	High incidence, low severity in Bronson Twp., Pembroke District.
<i>Monilinia seaveri</i> (Rehm) Honey	bCh, cCh	Centres of severe infection in Manvers and Cartwright twps., Lindsay District.
<i>Peridermium</i> sp.	jP, scP	Several centres of light infection in Westmeath and Maria twps., Pembroke District.
<i>Pollacia elegans</i> Serv.	lA	Commonly observed throughout the Southeastern Region.
<i>Polyporus fumosus</i> (Pers.) Fries	wS	Fruiting bodies common on white spruce stumps in Buchanan Twp., Pembroke District.
<i>Polyporus hirsutus</i> Wulf. ex Fr.	pCh	Small centre of high severity in Pentland Twp., Pembroke District.
<i>Polyporus pargamenus</i> Fr.	wS	Fruiting bodies common on stumps in Buchanan Twp., Pembroke Dist.
<i>Polyporus tomentosus</i> var. <i>circinatus</i> (Fries) Sartory & Maire	wS	Occasional fruiting bodies col- lected near white spruce stumps in Buchanan Twp., Pembroke Dist.
<i>Pseudotomus tumefaciens</i> (S. & T.) Duggar	Hi	Several centres of infection in Kemptville and Tweed districts.
<i>Pucciniastrum epilobii</i> Oth.	bF	Centre of high incidence and moderate severity in Sproule Twp., Pembroke District.
<i>Retinocyclus abietis</i> (Crovan) Groves & Wells	wS	Found on pole-size white spruce in Buchanan Twp., first Ontario record.
<i>Rhytisma punctatum</i> Fr.	stM	Eighty per cent striped maple in Finlayson Twp., Pembroke District, severely infected, numerous centres of infection in district.

TABLE 4 (concluded)

Organism	Host(s)	Remarks
Salt injury	Pinus spp.	Heavy damage to pines occurred along highway 115 in the Lindsay District, light to moderate damage at numerous other locations. Red pine trees in McNab and Horton twps. in Tweed District were moderately damaged.
<i>Sclerophoma pithyophila</i> (Corcia) Hoehn.	jP	Twenty-six per cent incidence, moderate severity in a stand of pole-size jack pine in Petawawa Twp., in Pembroke District.
<i>Stigmina pulvinata</i> (kunze ex Link) M. B. Ellis	Chinese elm	Commonly found on Chinese elm in the Kemptville District nursery; numerous Chinese elm hedges at various locations in Pembroke District, but mainly in the Town of Pembroke, moderately to severely infected.
<i>Taphrina cerasi</i> (Fuckel) Sadebeck	pCh	Centres of severe and light infection in Fraser and Head twps., Pembroke District.
<i>Thelephora terrestris</i> Ehrh.	forest floor	Fruiting bodies found commonly on forest floor in several plantations of conifers in Buchanan Twp., Pembroke District.
<i>Uncinula salicis</i> (DC. ex Merat) Wint.	bPo	Centres of heavy infection on understory balsam poplar in Cartwright Twp., Lindsay District; and Ross Twp. in Pembroke District.
Wetwood of Elm	Ulmus spp.	Centres of infection occurred in Lindsay, Tweed, and Kemptville districts. Heaviest infection in the Town of Lindsay on Chinese elm.
White Pine Resinosis	wP	Small numbers of white pine dead and small numbers in unthrifty condition due to this physiogenic disease in a plantation in Monmouth Twp., Lindsay District.

STATUS OF INSECTS IN LINDSAY DISTRICT

		Page
Cedar Leaf Miners.....	<u>Argyresthia</u> spp. and <u>Pulicalvaria thujaella</u> Kft.	A 9
Larch Casebearer.....	<u>Coleophora laricella</u> Hbn.	A 9
Lace Bugs.....	<u>Corythucha</u> spp. and <u>Gargaphia tiliae</u> Walsh	A 9
Nursery Pine Sawfly.....	<u>Diprion frutetorum</u> (F.)	A 10
European Spruce Sawfly.....	<u>Diprion hercyniae</u> (Htg.)	A 10
Introduced Pine Sawfly.....	<u>Diprion similis</u> (Htg.)	A 11
White-pine Shoot Borer.....	<u>Eucosma gloriola</u> Heinr.	A 11
Birch Leaf Miner.....	<u>Fenusa pusilla</u> (Lep.)	A 12
Root and Stump Weevils.....	<u>Hylobius pales</u> Boh. and <u>Pissodes approximatus</u>	A 12
Pine Engraver.....	<u>Ips pini</u> Say	A 12
Eastern Tent Caterpillar.....	<u>Malacosoma americanum</u> (F.)	A 13
Balsam-fir Sawfly.....	<u>Neodiprion abietis</u> complex	A 13
Red-headed Pine Sawfly.....	<u>Neodiprion lecontei</u> (Fitch)	A 14
Jack-pine Sawflies.....	<u>Neodiprion pratti banksianae</u> Roh. and <u>Neodiprion pratti paradoxicus</u> Ross	A 14
European Pine Sawfly.....	<u>Neodiprion sertifer</u> (Geoff.)	A 14
Pine Bark Aphid.....	<u>Pineus strobi</u> (Htg.)	A 15
White-pine Weevil.....	<u>Pissodes strobi</u> (Peck)	A 15
Larch Sawfly.....	<u>Pristiphora erichsonii</u> (Htg.)	A 16
European Pine Shoot Moth.....	<u>Rhyacionia buoliana</u> (Schiff)	A 16
Elm Bark Beetles.....	<u>Scolytus multistriatus</u> (Marsh.) and <u>Hylurgopinus rufipes</u> Eichh.	A 16
Summary of Miscellaneous Insects.....		A 17

Wm. J. Miller

Cedar Leaf Miners, Argyresthia spp. and Pulicalvaria thujaella Kft.

Population levels of cedar leaf miners increased in 1966 compared with 1965. Heavy infestations persisted in the southern half of the district and scattered pockets of light infestations occurred in the northern part of Victoria and Peterborough counties (see map).

Most of the white cedar in the southern half of the district was very sparsely foliated as a result of mining and shedding of the foliage for five consecutive years.

The species of miners found most frequently in 1966 were Argyresthia thuiella Pack., Argyresthia freyella Wlsh., Argyresthia aureoargentella Brower and Pulicalvaria thujaella Kft.

Larch Casebearer, Coleophera laricella Hbn.

Populations of the larch casebearer were high in small patches of larch in Hamilton Township, Northumberland County, and in a European larch plantation in Clarke Township, Durham County. In the rest of the district populations were very low (Table 5).

TABLE 5

Summary of Larch Casebearer Counts in Lindsay District
in 1965 and 1966

Location by township	Av. d.b.h. of trees in inches	Av. no. of larvae per 18-inch branch tip	
		1965	1966
Anson	8	0.2	0.3
Asphodel	8	1.2	1.0
Cardiff	8	0.3	0.2
Dysart	10	0.0	0.0
Galway	10	0.1	0.0
Haldimand	10	0.2	0.0
Hamilton	8	4.7	4.4
Harvey	8	1.0	2.2
Minden	10	0.0	0.0
Snowdon	8	0.1	0.5
Somerville	8	0.1	0.2
Stanhope	10	0.4	1.5

Lace bugs, Corythucha spp. and Gargaphia tiliae Walsh

Heavy infestations of lace bugs prevailed on white oak trees in the vicinity of Campbellford and along the Trent Canal in Seymour Township in Northumberland County. Light infestations occurred on black cherry in Minden Township, on basswood in Laxton Township, and on elm and other deciduous trees at scattered locations in the rest of the district. Infestations were less severe and widespread in 1966 than in 1965.

The species found most frequently in 1966 were; Corythucha arcuata (Say), C. ulmi O. & D., C. pergandei Heidmann, C. juglandis (Fitch) and Gargaphia tiliae Walsh.

Nursery Pine Sawfly, Diprion frutetorum (F.)

Populations of this sawfly remained at a low level on Scots pine throughout the district in 1966. The numbers of larvae in tray samples were generally lower than in 1965, but the difference was of little significance (Table 6).

TABLE 6

Summary of Nursery Pine Sawfly Larval Counts Taken in Lindsay District in 1965 and 1966

Location by township	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1965	1966
Burleigh	3	1	0
Cartwright	6	37	25
Clarke	4	7	6
Darlington	5	0	2
Fenelon	5	11	2
Haldimand	4	23	30
Hope	4	11	8
Manvers	3	5	5
Snowdon	4	9	8
Somerville	4	16	1

European Spruce Sawfly, Diprion hercyniae (Htg.)

Low populations of this sawfly occurred on white spruce trees throughout the district in 1966. Small numbers were also found on red spruce in Haliburton County. Population levels declined at most sample points compared with 1965 (Table 7).

TABLE 7

Summary of European Spruce Sawfly Larval Counts in Lindsay District in 1965 and 1966

Location by township	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1965	1966
Cardiff	10	9	9
Cartwright	9	8	1
Galway	16	29	8
Havelock	10	2	4
Laxton	17	34	9
Sherborne	10	30	7
Snowdon	10	11	3
Somerville	14	23	19
Stanhope	12	19	5

Introduced Pine Sawfly, Diprion similis (Htg.)

Light infestations of this sawfly persisted in Cartwright, Manvers and Clarke townships in Durham County. A light infestation in the southern part of Fenelon Township, Victoria County subsided in 1966. The variation in larval counts at most sample points was small and did not indicate any real changes in infestation intensity (Table 8).

TABLE 8

Summary of Introduced Pine Sawfly Larval Counts
in Lindsay District from 1964 to 1966

Location by township	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample		
		1964	1965	1966
Cartwright	6	18	19	18
Clarke	5	1	2	1
Fenelon	4	3	1	0
Manvers	5	13	2	6

White-pine Shoot Borer, Eucosma gloriola Heinr.

Light and medium infestations of this insect occurred in pine plantations throughout Durham and Northumberland counties. Population levels were highest in a Scots pine plantation in Haldimand Township where 100 per cent of the trees were infested with an average of 3.3 damaged shoots per tree (Table 9). Light infestations and small numbers occurred in Scots, white and red pine plantations in Victoria, Peterborough and Haliburton counties.

TABLE 9

Summary of Shoot Damage Caused by the White-pine Shoot
Borer in Pine Plantations in Lindsay District
from 1964 to 1966

NOTE: One hundred trees were examined at each location.

Location by township	Tree Species	Av. d.b.h. of trees in inches	No. of trees infested in 1966	Av. no. of infested shoots per tree		
				1964	1965	1966
Brighton	wP	7	100	2.0	1.5	1.9
Clarke	rP	4	18	1.0	1.0	0.2
Haldimand	scP	3	100	0.0	1.0	3.3

Birch Leaf Miner, Fenusa pusilla (Lep.)

Scattered pockets of heavy infestation of this miner occurred throughout the district in 1966. The heaviest damage was observed in Cardiff and Sherborne townships in Haliburton County and in Clarke and Cartwright townships in Durham County, where over 90 per cent of the foliage of white birch trees was infested (Table 10). Light infestations were common on White Birch undergrowth in the rest of the district.

TABLE 10

Summary of Birch Leaf Miner Damage in Lindsay District
1964 to 1966

NOTE: Counts were based on the examination of 100 leaves taken at random from three white birch trees at each location.

Location by township	Per cent of leaves mined			Total no. of mines		
	1964	1965	1966	1964	1965	1966
Brighton	5	8	12	8	8	15
Cardiff	-	-	100	-	-	200
Cartwright	-	-	98	-	-	196
Clarke	6	9	90	10	14	144
Eyre	2	75	77	6	150	150
Harburn	50	50	72	151	150	163
Havelock	4	10	25	9	16	34

Root and Stump Weevils, Hylobius pales Boh. and
Pissodes approximatus Hopk.

Heavy infestations and severe damage caused by these root and stump weevils persisted in the Christmas tree growing areas of Durham and Northumberland counties in 1966. Considerable flagging of Scots and white pine trees was caused by the adults feeding on the bark of the twigs.

Pine Engraver, Ips pini Say

Several small patches of heavy infestation of this beetle occurred in Scots pine Christmas tree plantations in Darlington Township, Durham County in 1966. Approximately 30 trees were severely damaged in each area and were dead by September. Heavy infestations also occurred on individual red pine trees in a plantation of 10- to 12-inch d.b.h. trees in the Victoria County forest. The trunks of the trees were completely girdled by the beetle galleries, and in most cases the trees were dead by late September.

In Glamorgan Township, Haliburton County, a plantation of 4- to 5-inch d.b.h. red pine trees was infested. A quantitative sample taken at this location in September revealed that 25 per cent of the 1500 trees in the plantation were heavily infested. Woodpeckers fed on the beetles and stripped most of the bark from the infested trees. When examined in September the foliage on the infested trees was still green but there is

little question that mortality will occur. Small numbers of infested red and Scots pine trees were observed at scattered locations in the rest of the district.

In the infestations noted above, there was a lack of suitable slash or wood available for the second generation of the insects. Under these circumstances the beetles attacked living trees.

Eastern Tent Caterpillar, Malacosoma americanum (F.)

Populations of this caterpillar declined to a very low level in the district in 1966. Light infestations occurred in patches of cherry trees in Harvey Township, Peterborough County and in Fenelon Township, Victoria County. Scattered colonies were observed in the rest of the district. Roadside brushing and spraying with herbicides by the Department of Highways was largely responsible for the drop in population levels.

TABLE 11

Summary of Eastern Tent Caterpillar Colony Counts
in Lindsay District 1964 to 1966

Location by township	No. of tents observed per mile of roadside		
	1964	1965	1966
Glamorgan	1	5	1
Guilford	1	1	0
Harvey	58	130	36
Lutterworth	42	102	0
Manvers	0	2	0
Minden	38	52	1
Percy	2	11	0
Snowdon	23	2	5

Balsam-fir Sawfly, Neodiprion abietis complex

Light infestations and small numbers of this sawfly occurred at scattered locations in the district in 1966, particularly in Haliburton and in the northern part of Victoria and Peterborough counties.

Two separate larval populations of this insect have occurred each year in the district since 1958. The distinction between the two is a matter of timing only. The early summer populations pupate at the time the mid-summer populations are hatching. From 1958 to 1964 the mid-summer larval populations were the most abundant but in 1965 and 1966 the early summer populations were the most common.

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

Heavy infestations occurred in red pine plantations in Stanhope, Minden and Glamorgan Townships in Haliburton County, in Somerville Township, Victoria County and in Cavendish Township and Asphodel Township in Peterborough County. Every tree in a 32-acre red pine plantation in Stanhope Township and a 2-acre plantation in Glamorgan Township was infested. Counts revealed an average of 4 and 6 colonies per tree respectively in these plantations. The trees in both plantations averaged 4 feet in height.

Control measures using emulsifiable D.D.T. at a 2.5 per cent concentration with water, and hand-operated pack sprayers were again carried out by personnel of the Ontario Department of Lands and Forests. The spraying was confined to plantations under the Department's management where heavy infestations occurred. In Stanhope and Snowdon townships and in the Victoria County Forest red pine plantations totalling 916 acres were sprayed. Results were generally good and in most instances defoliation following spraying was negligible.

Jack-pine Sawflies, Neodiprion pratti banksianae Roh.
Neodiprion pratti paradoxicus Ross.

Larval populations of N. pratti banksianae declined in 1966 for the third consecutive year. Light infestations occurred in small patches of jack pine in Dalton Township, Victoria County and in Minden Township, Haliburton County.

Heavy infestations of N. pratti paradoxicus occurred in jack pine plantations in Anstruther, Burleigh, Chandos, and Belmont townships in Peterborough County. Light infestations were observed in one plantation in Haldimand Township, Northumberland County, in several plantations in Methuen Township, Peterborough County and in one plantation in Dysart Township, Haliburton County. Population levels were higher at sample points in 1966 than in 1965. In Anstruther, Burleigh, Chandos, and Belmont townships 12, 10, 8 and 9 colonies per tree respectively were counted.

European Pine Sawfly, Neodiprion sertifer (Geoff.)

Minor advances in the known distribution of this sawfly occurred in 1966 in the northern part of Durham County and eastward into Cramahe Township in Northumberland County (see map). Pockets of heavy infestation within the area of infestation increased in number and quantitative samples revealed that larval populations were generally higher than in 1965. At sample points in Haldimand and Darlington townships more than 20 colonies per infested tree were counted and all trees in the plantations were infested (Table 12).

Control operations using a variety of insecticides were employed in the district. The Ontario Department of Highways sprayed roadside trees along Highway 401 in an effort to eradicate infestations. However the insecticides were applied when the insect was in the late larval stages and the effectiveness of the operation will not be known until larval populations become active in 1967. Private tree growers used helicopters to apply Phosphamidion and D.D.T. on plantations in Durham and Northumberland counties. In most

cases these operations were considered successful. In 1965 and 1966 a polyhedral virus was introduced in some of the heavy infestations with good results.

TABLE 12

Summary of European Pine Sawfly Colony Counts
in Lindsay District 1964 to 1966

NOTE: Counts were based on the examination of 100 Scots pine trees at each location.

Location by township	Number of trees infested in 1966	Average no. of colonies per tree		
		1964	1965	1966
Cartwright	100	8.5	0.2	3.6
Cavan	35	-	-	5.5
Clarke	100	-	-	5.6
Darlington	100	-	19.2	22.0
Haldimand	100	0	10.0	21.0
Hamilton	100	-	-	1.4
Manvers	25	-	-	2.0

Pine Bark Aphid, Pineus strobi (Htg.)

Scattered pockets of heavy infestation of this accidentally introduced aphid from Europe occurred in white pine plantations in the Northumberland and the Durham county forests, and in the southwestern part of Cartwright Township, Durham County. Since the infestations occurred on white pine trees over five inches d.b.h. no serious injury resulted.

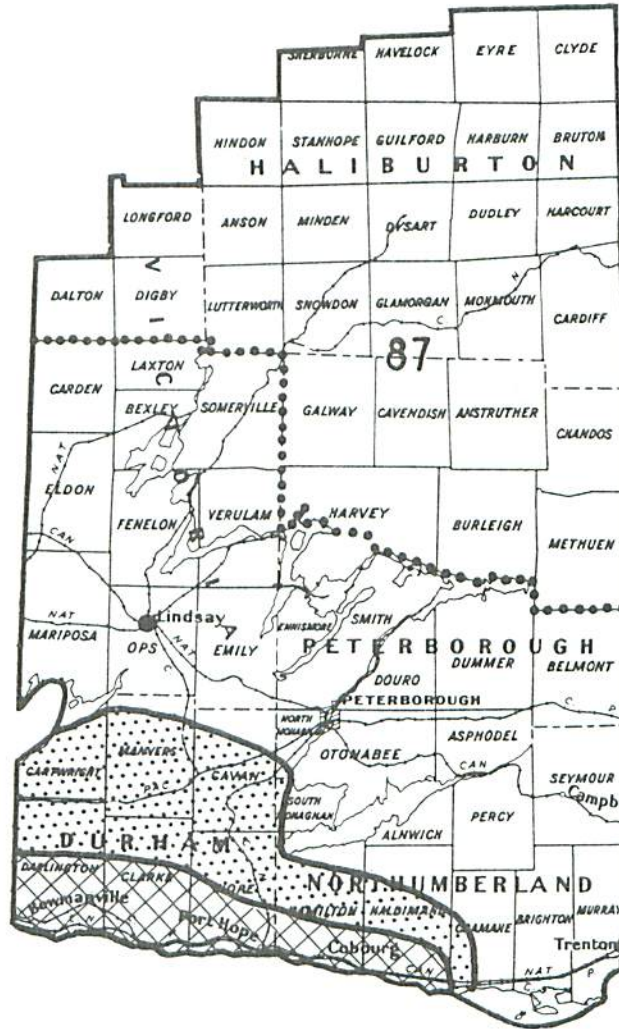
White-pine Weevil, Pissodes strobi (Peck)

Heavy infestations occurred in mixed pine plantations in Galway and Harvey townships in Peterborough County, in Dalton Township, Victoria County, and in a clump of mixed white and jack pine in Guilford Township, Haliburton County. Light infestations occurred in Asphodel, Cavendish, Guilford and Manvers townships. Small numbers of infested trees were observed in the rest of the district.

Populations were lower at sample points in 1966 than in 1965 (Table 13). In Galway Township a mixed pine plantation containing 45 per cent white pine, 45 per cent Scots pine, 8 per cent red pine and 2 per cent jack pine was examined to determine the incidence of weevil attack. The results are shown in Table 13.

Very few weevilled trees were observed in county forests or other plantations managed by the Department of Lands and Forests, demonstrating the effectiveness of control measures taken by departmental personnel.

LINDSAY DISTRICT



18 shot.

EUROPEAN PINE SAWFLY

Areas in which infestations occurred in 1966

Legend



- Heavy infestation 
- Light infestation 

TABLE 13

Summary of Damage by the White-pine Weevil
in Lindsay District in 1965 and 1966

NOTE: One hundred trees were examined at each location.

Location by township	Av. d.b.h. of trees in inches	Tree species	Degree of shade	Per cent of trees weevilled	
				1965	1966
Galway	3	scP	open	58	
"	3	wP	"	30	14
"	3	rP	"	0	9
"	3	jP	"	0	4
Stanhope	3	wP	40	5	0
Hamilton	4	wP	25	2	0
					2

Larch Sawfly, Pristiphora erichsonii (Htg.)

Populations of the larch sawfly have declined in Lindsay District for the past five years. In 1966 a small patch of medium infestation occurred at one location in Somerville Township, Victoria County, and two light infestations were observed in European larch plantations in the Northumberland County Forest and in the Durham County Forest. Relatively small numbers of colonies were found in the rest of the district.

The infestation in the Northumberland County Forest persisted at a high level for approximately eight years prior to 1965. In 1965 and 1966 heavy mortality of the insects in the mid-larval stages reduced populations to a very low level.

European Pine Shoot Moth, Rhyacionia bouliana (Schiff)

Heavy infestations of this insect continued on Scots and red pine along the MacDonald-Cartier Highway and along Highway 115 from its junction with Highway 2 north to the cutoff at Orono. A light infestation persisted in 1966 in a small red pine plantation in Cramahe Township, Northumberland County. Very small numbers were observed in the rest of the district.

In Hamilton Township, Northumberland County, a quantitative sample taken from a highway planting revealed that 100 per cent of the Scots pine trees were attacked and 52 per cent of the available bud clusters were infested. This sample was taken in late August when the overwintering larval population occurred in the bud clusters.

Elm Bark Beetles, Scolytus multistriatus (Marsh.) and
Hylurgopinus rufipes Eich.

Populations of the smaller European elm bark beetle, S. multistriatus occurred in the same areas in 1966 as in 1965. Light infestations to low numbers occurred on dead elms throughout Durham and Northumberland counties in the southern three townships in Victoria County, and in North Monaghan, Otonabee and Asphodel townships in Peterborough County.

Heavy infestations of the native elm bark beetle H. rufipes occurred throughout the district in 1966. Small increases in population levels occurred in 1966 compared with 1965. The abundance of dead elm trees throughout the district provided ideal conditions for an increase in population levels.

In areas where the range of the two species overlap in the district, H. rufipes predominates. This is contrary to the situation in the southern part of the Southwestern Region wherever the two populations occur, S. multistriatus outnumbers the native beetle.

TABLE 14

Summary of Miscellaneous Insects Collected
in Lindsay District

Insect	Host(s)	Remarks
<i>Adelges abietis</i> Linn.	wS	Light infestations occurred in a plantation of white spruce in the Orono Nursery.
<i>Agromyza ulmi</i> Frost	E.	Small numbers on a few trees in Harvey Township.
<i>Altica ulmi</i> Wood	E	Light infestations on a few scattered trees at one location in Minden Twp.
<i>Anacampsis innocuella</i> Zell.	tA	Light infestations on scattered trees in Dalton, Laxton and Methuen twps.
<i>Anchylopera burgessiana</i> Zell.	rO	Light infestations on scattered oak trees in Hope Twp.
<i>Aphrophora parallela</i> Say.	ScP	Heavy infestation in a Christmas tree plantation in Burleigh Twp.
<i>Apion nigrum</i>	Lo	Weevils numerous on patches of locust in Haldimand Twp.
<i>Argyrotaenia pinitubana</i> Kft.	wP	Light infestations of these tube makers on white pine understory in Ganaraska forest.
<i>Argyrotaenia quercifolia</i> Fitch.	Scarlet oak	Small numbers on a few trees in Haldimand Twp.
<i>Caliroa</i> sp.	rO	Medium infestations occurred (on red oak) in Haldimand Twp., Northumberland County.
<i>Cenopsis acerivorana</i> MacK	moM, sM	Light infestations at scattered locations in Monmouth and Dudley twps.

TABLE 14 (continued)

Insect	Host(s)	Remarks
<i>Chilocorus stigma</i> Say.	bPo	Small numbers observed at one location in Minden Township.
<i>Choristoneura fumiferana</i> Clem	wS	Small numbers in one plantation in Cartwright Township.
<i>Coleophera betulivora</i> McD.	wB	Birch casebearers were very scarce in Lindsay District. Small numbers were found in Cartwright Township.
<i>Coleophera fuscadinella</i> Zell.	wB	Small numbers found in Hope Twp.
<i>Coleophora ulmifoliella</i> MacD.	E	Heavy infestation on a few roadside trees at one location in Hope Twp. Small numbers found in the rest of the township
<i>Conophthorus resinosae</i> Hopk.	rP	Heavy infestations around Kennisis Lake in Havelock Twp. Small numbers at one location in the Northumberland County forest.
<i>Croesia semipurpurana</i> (Kft.)	O	Heavy infestations persisted in approximately 100 acres of oak in Clarke Twp, Durham County. Defoliation of infested trees was approximately 99%.
<i>Depressaria groteella</i> Rob.	Hazel	Light infestations on scattered clumps of hazel in Harcourt and Dudley townships.
<i>Ecdytolopha insiticiiana</i> Zell.	Lo	Heavy infestations of these stem borers in Clarke Twp. Light infestations in Burleight Township.
<i>Ectoedemia populella</i> Busck	tA	Heavy infestations in small patches of aspen in Douro Township. Light infestations in Cartwright, Clarke, Darlington, Hope and Cramahe twps.
<i>Epinotia nisella criddleana</i> Kft.	Po	Small numbers found throughout the district.
<i>Epinotia solandriana</i> Linn	wB	Light infestations in the Northumberland County forest and in Cartwright Township.
<i>Episimus argutanus</i> Clem.	Summac	Numerous in a small clump of summac at one location in Haldimand Twp.

TABLE 14 (continued)

Insect	Host(s)	Remarks
<i>Exoteleia dodecella</i> Linn.	scP	Heavy infestations on small clumps of ornamental trees planted along Highway 401.
<i>Exoteleia pinifoliella</i> Cham.	jP	A light infestation occurred in a plantation of jack pine at one location in Hamilton Twp. This was a decline from the heavy infestations of previous years at this location.
<i>Fenusa ulmi</i> Sund.	E	Heavy infestation occurred on Wyche elms in the Town of Cobourg. This infestation has persisted for over 10 years. Scattered trees were heavily infested in the rest of the district.
<i>Gargaphia tiliae</i> (Walsh)	Ba	Heavy infestations on small clumps of basswood trees in Clarke Twp.
<i>Gossyparia spuria</i> (Modeer)	E	Numerous scales on a few scattered trees at one location in Clarke Twp.
<i>Gracillaria cuculipennella</i> Hbn.	wAs	Heavy infestation occurred in one compartment of the Orono nursery.
<i>Hydria prunivorata</i> Fern	bCh	Small numbers were found on scattered clumps of black cherry trees throughout the district.
<i>Hyphantria cunea</i> Dru.	bCh, E, bAs	Very small numbers of tents were found throughout the district.
<i>Lithocolletis ostensackenella</i> Fitch.	Lo	Heavy infestations occurred on locust hedges in the Orono nursery.
<i>Lithocolletis salicifoliella</i> Chamb.	tA, ltA	Light infestations in small clumps of poplar in Seymour and Cartwright townships.
<i>Meadorus lateralis</i> Say	wB	Small numbers found in the Northumberland County Forest.
<i>Nematus limbatus</i> Cress.	W	Light infestations on willows near Minden and at one location in Harburn Township.
<i>Neodiprion nanulus nanulus</i> Schedl.	rP	Light infestations occurred on roadside trees at one location in Belmont Twp. An average of 10 colonies per tree was noted at one location in Chandos Township.

TABLE 14 (continued)

Insect	Host(s)	Remarks
<i>Nepticula</i> sp. (a petiole miner)	tA	Heavy infestations of these miners occurred in small patches of aspen in Clarke, Haldimand and Hope twps.
<i>Nephoteryx subcaesiella</i> Clem.	Lo	Small numbers were found at one location in Haldimand Township.
<i>Neurotoma inconspicua</i> (Nort.)	pCh	Small numbers were found at one location in Bruton Township.
<i>Parectopa robiniella</i> Clem.	Lo	Several acres of heavy infestation occurred at one location in Hope Township.
<i>Pareophora minuta</i> MacG.	bAs	Heavy infestation on a few small ash trees alongside the Mt. Julian Viamede road in Burleigh Township.
<i>Philonix nigra</i>	wO	Light infestations of these leaf galls in Haldimand Township.
<i>Pikonema alaskensis</i> (Roh.)	wS	Light infestations occurred on small clumps of white spruce in Emily and Snowdon townships.
<i>Phyllocolpa agama</i> (Roh.)	W	Light infestations on a few willows at one location in Clarke Township.
<i>Pristiphora cadma</i> W. & R.	wB	Small numbers occurred near Cranberry Creek in Dalton Township.
<i>Profenusa</i> sp.	wO	Heavy infestations occurred in approximately 200 acres of wO in the northern part of Hamilton Twp. Small patches of heavy infestation also occurred in Haldimand and Otonabee townships.
<i>Prolachnus agilus</i>	scP	These aphids were numerous on small numbers of Scots pine in a small area in Haldimand Township.
<i>Pityogenes hopkinsi</i> Sw.	sP	Heavy populations on a few white pine in Haldimand and Cavan twps.
<i>Podapion gallicola</i> Riley	rP	Heavy infestation in one plantation in the Northumberland County Forest.
<i>Pristiphora geniculata</i> (Htg.)	sMo	Light infestations on roadside trees in Haldimand Twp. Small numbers found in Hope and Eyre townships.

TABLE 14 (concluded)

Insect	Host(s)	Remarks
<i>Protoboarmia porcelaria</i> <i>indicataria</i> Wlk.	bF	Small numbers found in tray samples at balsam fir plots in Somerville and Minden townships.
<i>Sciaphilus asperatus</i> Bonzd.	sM	Heavy infestations of these weevils found on understory, deciduous trees in plantations in the Victoria County Forest in Somerville Twp. and in plantations in the northern part of Cartwright Township.
<i>Semiothisa bisignata</i> Wlk.	wP	Numerous in a white pine plantation in the Ganaraska Forest.
<i>Semiothisa dispuncta</i> (group)	wS, bF	Small numbers found in beating tray samples at scattered locations in the district.
<i>Semiothisa ocellinata</i> Gn.	Lo	Light populations occurred in clumps of locust in Haldimand, Otonabee, Hope and Clarke townships.
<i>Semiothisa pinitubana</i>	wP	Light infestations in plantations in the Ganaraska Forest.
<i>Tischeria castaneaeella</i> Cham.	rO	Small numbers of these leaf folders were found in plantations in Cramahe Township.
<i>Trisetacus alborum</i> Keifer	wP	Small numbers found in plantations in the Ganaraska forest.
<i>Xystoteras poculum</i>	wO	Small numbers found on scattered oaks in Haldimand Township.
<i>Zeiraphera ratzeburgiana</i> Ratz.	wS	Heavy infestations on scattered white spruce in Galway Township. Light infestations occurred in Dalton Township.